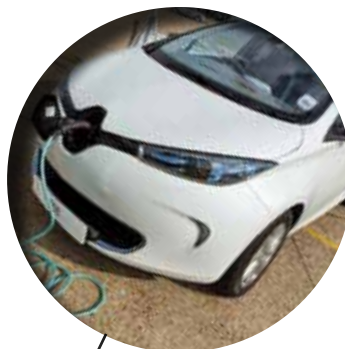


Local measures to encourage the uptake of low emission vehicles

GOOD PRACTICE GUIDE

Prepared by

L URBAN
FORESIGHT



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Executive Summary

Light duty vehicles, specifically cars, vans and taxis, contribute to air pollution and greenhouse gas emissions in town and cities across the UK. Low emission vehicles (LEVs) have an important role to play in addressing these twin challenges and contribute to sustainable transportation systems. Action taken at the local level can be instrumental in complementing national policies by making LEVs more convenient, cost effective and desirable to use than higher-emitting vehicles.

This good practice guide aims to assist local authorities understand a broad range of policy measures and initiatives that can be utilised to encourage the uptake of LEVs. The guide covers 12 distinct areas including planning, procurement, taxis and private hire vehicles, parking and infrastructure provision. Examples of successful private public partnerships are explained in combination with case studies of good practice in the UK and internationally. The guide outlines challenges local authorities face with adopting LEV policies, and provides recommendations for how these can be overcome.

Currently the market for a variety of LEVs, such as battery electric and plug-in hybrids, is at its early stages and requires national and local incentives to stimulate consumer demand and increase vehicle numbers. In order to achieve more rapid emission reductions, it is recommended that local authorities encourage the most efficient and least polluting vehicles run on fossil fuels

by adopting policies that prescribe the latest European engine emission and CO₂ emissions standards. It is essential that policies are reviewed and updated as stricter regulations are introduced.

Local authorities have a central role in communicating information regarding the benefits and performance of LEVs in order to encourage more informed purchasing decisions by individuals and businesses, and increase awareness of new types of vehicles and infrastructure. Local authorities will need to work in partnership with a wide range of private and public stakeholders to deliver various policy measures and foster the growth of LEV fleets. Local authorities can also set an example by integrating LEVs into their own fleet and contracted services.

A key recommendation from this guide is that policy measures implemented at the local level are consistent with each other, so as to create complementarity between areas and not confusion. If people wish to drive from town to town and city to city, they need clarity about where they can and can't drive and park, and therefore it is important that local authorities look to harmonise their efforts to prevent a patchwork of measures from developing. Through consulting this guide in their efforts to increase uptake of LEVs, it is hoped that local authorities can offer consistent benefits to individuals and companies which will give LEV drivers the peace of mind and confidence they need to make the switch.

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1 Introduction

1.1 OVERVIEW This guide has been commissioned by the Low Carbon Vehicle Partnership to help local authorities understand a broad range of measures available to them to promote the uptake of low emission vehicles (LEVs) – specifically light duty vehicles (LDVs) covering cars, vans up to 3.5 tonnes and taxis.

Cars, vans and taxis are all major contributors to both air pollution and greenhouse gas (GHG) emissions in towns and cities across the UK. The uptake of LEVs is central to improving local air quality and public health, tackling climate change and developing more integrated and sustainable transport systems. A particular challenge is that there is no standard definition of an LEV (see section 2.4 for more details) which makes it difficult for local authorities to know what to strive for in setting policies aimed to promote their uptake. At present the market for alternative fuelled vehicles, e.g. pure electric and plug-in hybrids, is extremely low relative to the total new car market, representing just over 2% in 2014; see Appendix 1. Local policy has an important role to play in complementing the national policy framework with regards to helping this market grow over the next five to ten years. Equally essential is the need to encourage the purchase of the most efficient fossil fuel-powered vehicles that meet the latest European engine emission standards.

Many of the most effective enabling measures and policy levers that can support the increased uptake of LEVs are local rather

than national. A range of local assets and powers can be harnessed to encourage the take-up of LEVs. These typically fall outside the direct control of the UK government or devolved administrations, being managed by local authorities and linked local/regional actors from both the public and private sectors. Importantly, local authorities can influence the uptake of both private individual purchasers and business fleets, in conjunction with facilitating the provision of new types of vehicle infrastructure.

A number of local actors across the UK, Europe and further afield have begun to implement measures to incentivise adoption of LEVs in their own fleets and to help create market demand. These measures span a range of different policy areas including procurement, transport, planning, climate change, air quality and public health. Importantly such measures are not just restricted to local government but can also be implemented by a range of public and private organisations.

Whilst not every city or town will adopt the same approach, it is important that measures to encourage take-up of LEVs implemented across local authorities are consistent, in order to avoid a fragmented patchwork of policies being introduced in different cities and regions. This guide is therefore designed to provide an overview of the available policy measures and offer information on what is already underway and where some of the challenges in implementation lie.

1.2 SCOPE The guide covers all light duty vehicles, including cars, taxis and vans of up to 3.5 tonnes. It also covers a range of fuels and technologies, including efficient internal combustion engines, battery electric, plug-in hybrid, hybrid, hydrogen, compressed natural gas (CNG), liquid petroleum gas (LPG) and biomethane.¹

A range of policy measures is identified, alongside specific implementation details

and case studies from across the UK and overseas. The guide also provides examples of non-government local measures and good practice public-private partnership (PPP) initiatives related to LEVs. This focuses on measures that can be introduced within the next 10 years and deliver benefits during this timeframe.

1.3 INCENTIVES AND BENEFITS It is important to recognise that measures to incentivise the adoption of LEVs can take a variety of forms. Measures identified in each of these areas have been selected because they offer one or more of the benefits. The scope of what can be considered an incentive or benefit is outlined below:

- » Incentives are not just financial, as they may also take the form of some commodity or object that is desired by the recipient (e.g. saving time, privileged access, status).
- » Incentives do not have to be focused on rewarding a desired behaviour, but can also impose an unwanted penalty or withdraw

some desired objects to those that do not adopt low emission vehicles (e.g. restrictions or penalties on fossil-fuelled vehicles).

- » Incentives do not have to be targeted at individuals but could be provided to a group, organisation or community (e.g. rewards for communities that achieve a high level of adoption).
 - » While most incentives are realised immediately, others can be awarded only at a later time (e.g. when adoption leads to a positive outcome such as improved air quality).
-

1.4 METHODOLOGY The guide has been developed through extensive primary and desk-based research. Interviews were conducted with 27 stakeholders, representing UK local authorities, European local authorities, PPPs and non-governmental organisations. Additionally 68 UK local authorities – covering both urban and rural areas, and both

upper tier (county/regional councils) and lower tier (local – city or town councils) – contributed to an online survey to inform the guide. Details on the locations of the survey participants as well as the segmentation of participating local authorities can be found in Appendix 2. The geographical location of the interviews is shown in Figure 1.

¹ Biomethane is a renewable form of natural gas produced from the decomposition of organic waste such as municipal waste, sewage, manure and agricultural wastes, via the process the process of anaerobic digestion.

Figure 1 - Geographical location of the interviewees



1.5 STRUCTURE OF THE GUIDE

The next section of the guide outlines the national policy framework, cross-cutting local and regional level policy and overarching themes that apply across the range of measures available to local authorities to promote LEVs. The following sections then review different areas in more detail, namely:

- » Planning
- » Procurement
- » Infrastructure provision
- » Education and communication
- » Road access and charging
- » Parking
- » Car clubs
- » Taxis and private hire vehicles
- » Integration with the wider transport network
- » Pilots and trials
- » Financial measures
- » Links to economic development and tourism

Each of these sections provides a summary of related measures and benefits, details about the implementation mechanisms and enablers for each measure, examples of implementation and case studies.

In addition, each section highlights identified and potential challenges and barriers to be overcome as well as an outlook to the future prospects of the measures across UK local authorities.

2 Overarching Frameworks and Cross-Cutting Themes

2.1 INTRODUCTION

For each of the areas considered in this guide there are a number of common issues and considerations that apply. Moreover, the overarching frameworks under which

these measures are implemented are also cross-cutting. This chapter outlines these factors and summarises key considerations that are applicable throughout this guide.

2.2 POLICY FRAMEWORKS

Actions taken at the local level are greatly influenced by the overarching frameworks set by the European Commission, UK government and devolved administrations. Table 1 on the following page provides an overview of the national policy framework related to LEVs. Improving local air quality has been one of central policy drivers for LEVs, accompanied by an emphasis on reducing CO₂ emissions from road transport.

At a national level the Office for Low Emission Vehicles (OLEV) is leading policy measures related to advancing the market for ultra low emissions vehicles (ULEVs) – battery electric, plug-in hybrid and hydrogen fuel cell vehicles. In 2013 OLEV published the “Driving the Future Today” strategy for ULEVs in the UK, this focuses on building the market and developing infrastructure for both plug-in electric and hydrogen vehicles. In 2014 OLEV announcement a

£500 million funding package to help grow the ULEV market up to 2020. This covers research and development, plug-in car and van grants, low emission bus grant support for electric vehicle charging and natural gas refuelling stations. The package includes several local authority specific packages:

- » Go Ultra Low City Scheme – £35 million to 2-4 cities in the UK to help increase the uptake of ULEVs through innovative local measures.
- » £20 million for local authorities to introduce ULEV taxis.
- » A £5 million government fleet procurement programme to support the uptake of ULEVs within central Government fleets, will roll out to other public service providers and local authorities.

Table 1 – National Policy Framework related to LEVs

| TRANSPORT | PLANNING | AIR QUALITY | CLIMATE CHANGE | PROCUREMENT |
|---|---|---|--|---|
| Local Transport Act 2008 | National Planning Policy Framework | Environment Act 1995 The Air Quality Standards Regulations 2010 Mayor's Air Quality Strategy 2010 | Climate Change Act 2008 | The Government Buying Standards For Transport (Vehicles) 2012 |
| Road Traffic Regulation Act 1984 | Permitted Development Rights 2011 | Local Government Act 2000 | Fuel economy labelling and CO ₂ emission based car taxation | Cleaner Road Transport Vehicles Regulations 2011 |
| Road Vehicle (Construction and Use) Regulation 1986 | Section 106 of Town and Country Planning Act 1990/ Section 75 of Town and Country Planning (Scotland) Act 1997 | Driving the future today: a strategy for ultra low emission vehicles in the UK: £500 million funding package to support uptake of ULEVs from 2015 to 2020 – grants for cars, taxis, vans, buses, motorcycles and infrastructure | | |
| Localism Bill 2010-11 | Community Infrastructure Levy (CIL) 2010 | Health and Social Care Act 2012 | | |
| Local Transport White Paper 2011 | | | | |

2.3 LOCAL POLICY DRIVERS

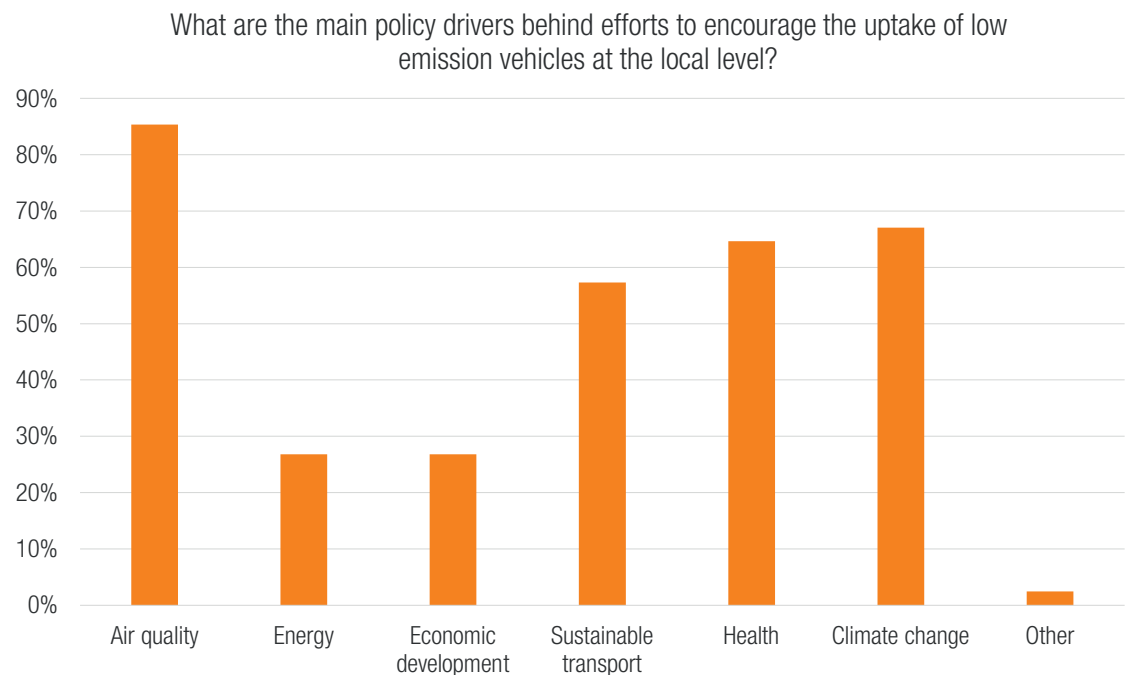
Many local authorities are committed to encouraging people to travel by the most sustainable modes. This encourages the provision of infrastructure that caters for walkers first, followed by cyclists, then public transport with the private car last. However, an overwhelming majority of journeys are undertaken by car; in 2012, 64% of all trips in Britain were made by car (as a driver or a passenger) and 78% of total distance travelled was by car.² Moreover, even with increased uptake of active travel and public transport, there will continue to be many

instances in which cars are an important mode of transport. Therefore an objective for local authorities is to facilitate car use in the least disruptive way to local communities.

There are a variety of policy areas that motivate local government to promote LEVs. As shown in the research undertaken for this guide, most of the local authorities surveyed held air quality to be one of the main policy drivers for LEVs followed by climate change, health and sustainable transport (see Figure 2).

² Department for Transport (2013) National Travel Survey, Statistical Release, 30 July 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/243957/nts2012-01.pdf

Figure 2 – Policy drivers to encourage uptake of LEVs at the local level



2.4 DEFINITIONS

There is no formal definition as to what constitutes a ‘low’ emission vehicle. Local authorities often do not articulate specifically what is covered in their understanding of LEVs when setting strategies. For example, both the City of York Council’s Low Emission Strategy (October 2012) and draft West Midlands Low Emission Strategy (April 2013)³ highlight the need to promote and incentivise the use of LEVs but do not specify the vehicles included. York places particular emphasis on ‘electric, CNG, biomethane and those which make use of hybrid technology’ in its strategy, but it is not prescriptive.

Regarding taxis, Oxford’s Low Emission Strategy specifies that action to promote ‘zero’ emission vehicles will focus on electric vehicles. Other local authorities refer to specific alternative fuels or zero emission vehicles. Survey participants in this study highlighted this issue, one of whom expressly stated: “[Our] Council does not have its own definition”. With local authorities using different terminology, harmonising approaches across the UK is difficult.

³West Midlands Low Emissions Towns & Cities Programme, Low Emission Strategy: Final Draft for Consultation (April 2013), cms.walsall.gov.uk/draft_low_emissions_strategy_april_2103.pdf (Final version as yet unpublished (May 2015)).

IN SUMMARY – DEFINING LEVs

A number of factors need to be considered when defining what constitutes an LEV. Here are some useful pointers which have been used in developing this guide

- a. Definitions often follow either Euro standards or CO₂ emission standards.
- b. LEVs are not just alternative fuels and plug-ins; efficient conventional internal combustion engines can also be considered low carbon and upgrading a large proportion of vehicles to a higher Euro standard, can also improve air quality.
- c. The levels set are not uniform, they will depend on:
 - i. the policy instrument in question
 - ii. the level of ambition
 - iii. the point in time at which they were implemented
- d. As such, targets and standards for LEVs are not static – and local governments should be mindful that regular periodic review will be required to ensure that developments are taken account of.
- e. Whilst it is challenging to have a common definition of a LEV, local authorities should strive to set complimentary emission standards to avoid confusion about what criteria apply across different cities and policies.
- f. The standards apply to new vehicles, but given that the average age of a car in the UK is 7 years old, local authorities need to be mindful that there is a lag between the newest vehicles and the average fleet.

Recent developments, such as the approval of London's Ultra Low Emissions Zone (ULEZ), is bringing definitional clarity to what constitutes an 'ultra low' emission vehicle, as well as addressing the need for long term planning as standards change – in that the Euro standards are being used and the ULEZ standards will be rolled out between 2020 and 2023.⁴ In the case of vans, the terminology and standards are even less well developed, although again, OLEV's Plug-in van grant does supply technical eligibility criteria which offer some clarity for local authorities.

Most approaches taken by local authorities discussed in this guide follow either CO₂ emission standards or Euro standards for air quality, but the levels set or aspired to are not uniform. Research undertaken for this guide found that local authorities

use different definitions partly based on subjective interpretations on the appropriate level of ambition of different measures, as well as the point in time at which they were implemented. As a result, in some instances, the LEV classification used by local authorities often does not necessarily represent the latest or most ambitious standards. It is essential that policy measures specify and update ambitious emissions standards in order to encourage a shift to cleaner vehicles. Whilst it is challenging to have a common definition of an LEV, local authorities should strive to set complimentary emission standards to avoid confusion for drivers; this especially important if wider scale policies will develop across the UK.

As highlighted by Table 2, targets and standards for LEVs are not static and it is

⁴The London Ultra-Low Emission Zone (ULEZ) requires that cars (including private hire vehicles) and small vans are compliant with Euro 6 for diesel engines (5 years old or less in 2020) and Euro 4 for petrol engines (14 years old or less in 2020). Taxi requirements will be announced in the Summer 2015. For full details see: <http://www.tfl.gov.uk/modes/driving/ultra-low-emission-zone?cid=ultra-low-emission-zone>

important that local authorities review such changes in the classifications and definitions that they use for LEVs over time. A further consideration is the time that it takes for changes to come into effect. As shown in Figure 3, there is a lag between the introduction of a new standard and the lowering of emissions of cars on the road. This is largely a reflection of the rate of turnover of vehicles, with the average age of a car in the UK currently 7 years and rising (13 years at the end of its life and rising).

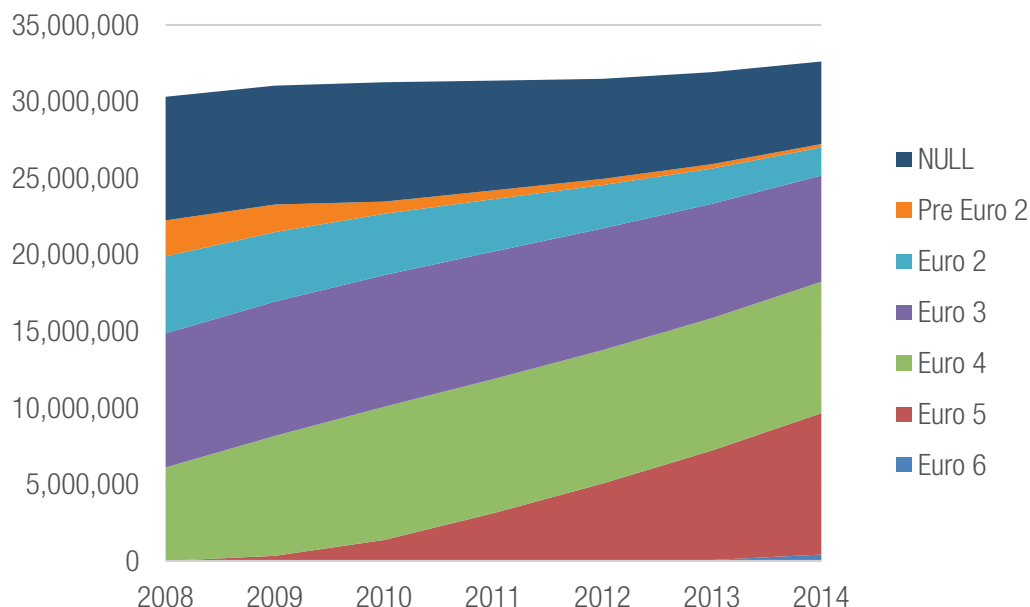
Local authorities can define LEVs by using Euro standards set for various air pollutants including NO_x and PM. As shown in Table 2, the Euro 6 standard applies to all new car registrations from 1 September 2015 and will apply to all vans by 1st September 2016. The introduction of Euro 6 shows a large reduction in NO_x emissions compared to Euro 5; this is particularly relevant given the challenges which the UK faces with achieving the EU Limit Value for NO₂.

Table 2 – Euro engine emissions standards (SMMT)

| EURO STANDARD | NEW TYPE APPROVALS | ALL NEW CARS REGISTERED | PETROL NO_x (mg/km) | DIESEL NO_x (mg/km) |
|----------------------|---------------------------|--------------------------------|--------------------------------------|--------------------------------------|
| Euro 1* | 1 Jul 1992 | 31 Dec 1992 | 490 | 780 |
| Euro 2* | 1 Jan 1996 | 1 Jan 1997 | 250 | 730 |
| Euro 3 | 1 Jan 2000 | 1 Jan 2001 | 150 | 500 |
| Euro 4 | 1 Jan 2005 | 1 Jan 2006 | 80 | 250 |
| Euro 5 | 1 Sep 2009 | 1 Jan 2011 | 60 | 180 |
| Euro 6 | 1 Sep 2014 | 1 Sep 2015 | 60 | 80 |

* Euro standards 1 and 2 did not cover just NO_x, but also HC. Subsequent Euro standards have considered NO_x alone.

Figure 3 – Cars on the road in the UK by Euro standard (2008-2014) (SMMT)



Different standards also exist for taxi and van fleets. Accordingly local authorities need to be mindful of the fact that there are multiple standards to be aware of and to keep up to date with changing requirements.

In 2014, the average CO₂ emission of new cars in the UK was 124.6g/km (SMMT). Details on historical new car CO₂ emissions and market share can be found in Appendix 3. The European Parliament and the Council of the European Union have set mandatory fleet average CO₂ emission targets that new cars and vans have to meet in 2020. For new cars an ambitious target of 95 g/km for 2020 and for light commercial vehicles 147g/km CO₂ (fleet averages).

Various performance standards have been given CO₂ emissions for light duty vehicles in local and national policy. The most recent CO₂ thresholds for ULEVs have been provided by OLEV:

- » To be eligible for the plug-in car grant, the following criteria must be met:
 - » Category 1: CO₂ emissions of less than 50g/km and a zero emission range of at least 70 miles.
 - » Category 2: CO₂ emissions of less than 50g/km and a zero emission range between 10 and 69 miles.
 - » Category 3: CO₂ emissions of 50-75g/km and a zero emission range of at least 20 miles.
- » To gain support from plug-in van grant, vehicles must be less than 3.5 tonnes and emit less than 75g/km with a zero emission range of at least 60 miles.
- » To gain support for the low emission taxi grant, taxis are required to meet the same criteria as those set for the plug-in car grant.

2.5 RESPONSIBILITIES

The diversity of measures available to local authorities to promote LEVs means that the responsibilities to action such measures are distributed across local authorities.

Figure 4 gives an overview of which officers and departments have a lead and

supporting responsibility for each of the measures considered in this guide. It is clear that local authority departments need to be working together and that measures will need to be delivered through cross-departmental implementation.

Figure 4 – Overview of departmental responsibilities across different policy areas

| | | Department | | | | | | | | | | | | | |
|--------|--|------------------|-------------------|---------------|----------------------|--------------------|-------------------------------------|---------|------------------|-------|-----------|---------------------|----------|-------------|------------------|
| | | Building Control | Customer Services | Communication | Economic Development | Education Services | Environment and Regulatory Services | Finance | Fleet Management | Legal | Licensing | Parking Enforcement | Planning | Procurement | Transport Policy |
| Policy | Planning | | | | | | | | | | | | | | |
| | Procurement | | | | | | | | | | | | | | |
| | Infrastructure Provision | | | | | | | | | | | | | | |
| | Education and Promotion | | | | | | | | | | | | | | |
| | Road Access and Charging | | | | | | | | | | | | | | |
| | Parking | | | | | | | | | | | | | | |
| | Car Clubs | | | | | | | | | | | | | | |
| | Taxis & Private Hire Vehicles | | | | | | | | | | | | | | |
| | Integration with the Wider Transport Network | | | | | | | | | | | | | | |
| | Pilots & Trials | | | | | | | | | | | | | | |
| | Financial Measures | | | | | | | | | | | | | | |
| | Links to Economic Development & Tourism | | | | | | | | | | | | | | |

Lead responsibility
 Supporting responsibility

2.6 IMPLEMENTATION

This diversity of responsibilities across local authorities also creates a number of opportunities to embed commitments into a range of strategies and action plans. These include:

- » Local Transport Plans
- » Local Development Plans/
Unitary Development Plans
- » Local Implementation Plan (London Councils)
- » Air Quality Action Plans
- » Climate Change Action Plans/Obligations
- » Low Emissions Strategies
- » Fleet and Sustainability
Procurement Strategies
- » Health Outcomes Framework and
responsibilities related to the Health
and Social Care Act 2012⁵

There are a number of additional factors that can contribute to the effective implementation of these different measures.

Integrating policy areas and measures related to LEVs and the provision of infrastructure across a range of local authority plans, strategies and policy domains. As is demonstrated in the measures discussed in this report, there is significant cross over between policy areas such as planning, parking, infrastructure development, which needs to be considered, but more generally the role of LEVs needs to be thought of as part of the broader overarching policy landscape.

Identifying a champion within a local authority can be greatly beneficial, both in terms of policy creation and implementation. This was held to be most successful when the same individual saw this process through from the inception of policy through to final implementation.

The ability to demonstrate **longer-term savings** can be crucial in new projects with relatively high capital cost in the current economic climate. This includes quantifying the cost-benefits of air quality improvements and carbon emission savings, as well as the indirect associated costs, i.e. to health, to strengthen the case for different measures.

Collaboration and knowledge-sharing can also support the effective implementation of measures. This includes cooperation within and between local authorities. It also extends to the value of engaging with government, the private sector (including local businesses) and existing networks.

Local authorities also have an important role in supporting, coordinating and **mobilising local stakeholders** from across the public and private sectors to encourage uptake of LEVs. Many of the structures to achieve this exist in the form of Local Enterprise Partnerships, Community Planning Partnerships and various other established networks and committees in which local authorities have a central role.

This can also take the form of **PPPs**, which can provide local authorities with access to capital, expertise and manpower to implement measures to promote LEVs. In practice, many of the examples considered in this guide have used such an approach. This includes the use of shared funding models to catalyse deployment of infrastructure and partnerships to trial new technologies or business models.

⁵As of April 2013 upper tier and unitary local authorities have new responsibilities for health improvement

2.7 CHALLENGES

A number of common challenges and barriers to action can influence the ease of implementation and relative success of different measures.

The lack of a clear, common **definition of an LEV** can make it challenging to prepare and implement policies and legislation.

Many local authorities have **limited resources**, and are facing the prospect of further cuts as a result of the current economic climate. In such situations, it is necessary to quantify the positive impacts and potential cost and emissions savings of different measures.

A related issue is that many authorities have **competing priorities** that will influence

whether resources are allocated to measures to promote LEVs. One such example is a perceived inconsistency between measures to promote LEVs and initiatives to discourage vehicle use. Similarly, measures to make it less expensive to use vehicles that are perceived to only be affordable to higher earning individuals can be seen to be contrary to objectives of reducing inequality.

A number of **political factors** can also challenge the implementation of measures. This includes: the degree of support amongst council members, changing priorities between election terms and a lack of continuity in funding.

2.8 OUTLOOK

Effective promotion of LEVs and their associated infrastructure can be supported by ensuring that measures across the UK are coordinated and coherent. This requires regional and national bodies to facilitate cooperation between local authorities, avoiding a patchwork of measures developing across the UK. Inconsistent implementation of measures across municipal or regional boundaries would be confusing to the public and could undermine the perceived benefits of such initiatives. However, it is also important that frameworks to achieve this alignment do not hold back local authorities that have begun to implement measures.

A key starting point for alignment will be consensus on the definitions of what constitutes an LEV. Because LEV technologies are developing apace, the threshold for what is considered 'low' emission is also continuously changing. This requires local authorities to anticipate and respond to these changes, perhaps setting limits on particular measures, or to review the incentives periodically, ensuring that corresponding policies and regulation are and remain sufficiently stringent and ambitious.

Many of the local authorities engaged in this research were principally focused on the promotion of ULEVs, and in particular electric vehicles. As markets for these technologies are at a relatively early stage in their development, such support will continue to play an important role in the short to medium-term. However, opportunities to eliminate the highest emitting vehicles and to promote uptake of more efficient fossil fuelled vehicles can also contribute to a reduction in emissions from road transport at the local level.

For many local authorities, air quality will be the main driver for the promotion of LEVs. Cost-benefit analysis that shows the expected health and economic benefits can help local authorities to prioritise investments in such measures at times when capital budgets and human resources are limited.

Cooperation within and between local authorities, and the development of public-private partnerships will also help to maximise the resources and expertise available to promote LEVs and advance a comprehensive range of measures to support uptake.

Local authorities are also well positioned to show leadership through commitments to LEVs. This can help to create markets for new low emission technologies as well as giving other local stakeholders confidence to switch to such vehicles.

No single measure is likely to create a step change in LEV uptake; with areas that achieve greater uptake likely to be implementing a comprehensive package of measures that connect with different motivations and enhance the cost and convenience benefits of these vehicles. However, efficient allocation of resources by local authorities may require that certain measures are priorities in the short to medium-term. Whilst not comprehensive and drawn from participants' perspectives, Figure 5 highlights some analysis undertaken in this study to illustrate the expected impact and ease of implementation of selected measures.

Figure 5 – Assessment of impact/ease of implementation of measures considered in this guide (informed by survey participants and LowCVP Steering Group)

| | | EASE OF IMPLEMENTATION | | |
|--------|----------|--|--|---|
| | | Less Challenging | Moderate | Challenging |
| IMPACT | High | <ul style="list-style-type: none"> » Discounted parking for LEVs » Discounted residential parking permits for LEVs » Reduced fees for taxi and private hire licenses » Business support » Educational and promotional activities » Information exchange | <ul style="list-style-type: none"> » Discounted road charges or tolls for bridges/tunnels » Flexible taxi licensing caps » Taxi emission standards » Discounted and integrated travel » Freight consolidation centres » LEV-based car clubs » Local authority trials of new technologies and business models » Facilitating local demonstration projects and trials | <ul style="list-style-type: none"> » Access to bus lanes » Access to high occupancy vehicle lanes » Links to economic development and regeneration |
| | Moderate | <ul style="list-style-type: none"> » Dedicated parking for LEV car club vehicles » Workplace parking levy » Dedicated LEV taxi ranks » Rebates/incentives for LEV taxi purchase » Discounted parking fee at park and ride sites » Travel plans » Links to tourism » Advisory services » 'One-stop shop'/promotion office » Demonstration | <ul style="list-style-type: none"> » Reduced waiting time for parking permits for LEVs » Discounted electricity for recharging » Access to refuelling/ recharging infrastructure » Discounted recharging/ refuelling at park & ride sites » Dedicated parking bays for LEV-based car clubs » Procurement of LEVs » Setting LEV standards for procurement of transport services for local government » Salary sacrifice schemes | <ul style="list-style-type: none"> » Reduced parking spaces for high emission vehicles » Dedicated LEV parking (not including recharging) » Low emission zones/ultra low emission zones and exemption from congestion charges » Financing and contracting models for fleets |
| | Low | <ul style="list-style-type: none"> » Planning conditions in development frameworks » LEV specifications in building codes » Permitted development rights for charging infrastructure » Discounted car ferry tariff | <ul style="list-style-type: none"> » Grants/loans for refuelling/ recharging infrastructure » Infrastructure installation in rental properties » Setting LEV standards for procurement of municipal services » LEV-preferred personal leases » Discounts for local public services | <ul style="list-style-type: none"> » Business rate relief |



Image credit: Håkan Dahlström

3 Planning

3.1 INTRODUCTION Planning has a major impact on the way in which people move around towns, cities and communities, and therefore influences the uptake of LEVs and the provision of infrastructure to support them. Strong planning policies can protect city centres against out-of-town developments, and forethought in planning can save costs in the longer-term, ensuring that the infrastructure is in place as the number of LEVs grows.

There are a number of measures that can be undertaken by local authorities to foster the uptake of LEVs which are considered in more detail elsewhere in this guide. Planning can facilitate development of the LEV market by supporting parking policy (see chapter 8), introducing car clubs (see chapter 9) and installing infrastructure for a range of alternative fuels, including electricity, CNG, biomethane and hydrogen (see chapter 5).

The planning processes can sometimes delay the installation of new infrastructure, which is in turn a barrier for implementing LEV initiatives. Planning for and installing infrastructure (see chapter 5) should therefore be strongly linked.

Planning is an area of policy where it is important for local tier councils to work with upper tier/district councils to ensure that developments are suitable and compatible. Such measures can be implemented via a combination of planning and transport teams, regeneration and environmental services, as well as the Highways Authority outside the local government, considering in the regional context.

3.2 OVERVIEW

A range of local authority measures to encourage uptake of LEVs that relate directly with planning is outlined in Table 3.

Table 3 – Planning measures to promote LEVs

| MEASURE | DETAILS |
|---|--|
| Planning conditions in development frameworks | Specify a minimum requirement for provision of LEV spaces (and associated infrastructure) in new developments |
| (U)LEV specifications in building codes | Specify the need for (U)LEV vehicle readiness in new and renovated buildings |
| Permitted development rights for charging infrastructure | Electric vehicle charge point installation designated as a permitted development right |
| Infrastructure installation in rental properties | Makes a term in a lease, contract, security instrument, or similar void to be unenforceable if it prohibits or unreasonably restricts the installation of electric vehicle charging in a lessee's designated parking space |
| Developer contributions | Planning obligations (section 106/section 75), community infrastructure levy, highway contributions |
| Local Development Orders securing land for infrastructure | Using Local Development Orders to secure land for infrastructure |

3.3 IMPLEMENTATION

Planning conditions and building regulations can be used to encourage the routine installation of charging infrastructure in new developments or to make sure that the necessary servicing and ductwork is in place to allow for easy installation in the future. Making such provisions at the time of construction can offer considerable savings over the cost of retrofitting such infrastructure.

Planning gain agreements made under Section 106 of the Town and Country Planning Act 1990 (as amended) and Section 75 of the Town and Country Planning (Scotland) Act 1997 are by far the most widely-used tools. These agreements can be used for a wide range of purposes, including governing large developments, mitigating the impact of development, and for environmental improvements in the urban environment.

Low emission zones in new developments can be enforced using planning gain conditions. In such instances, developers would receive permission under a set of conditions and they would be required to produce compliant plans and documentation to discharge these requirements. More information on low emission zones can be found in chapter 7.

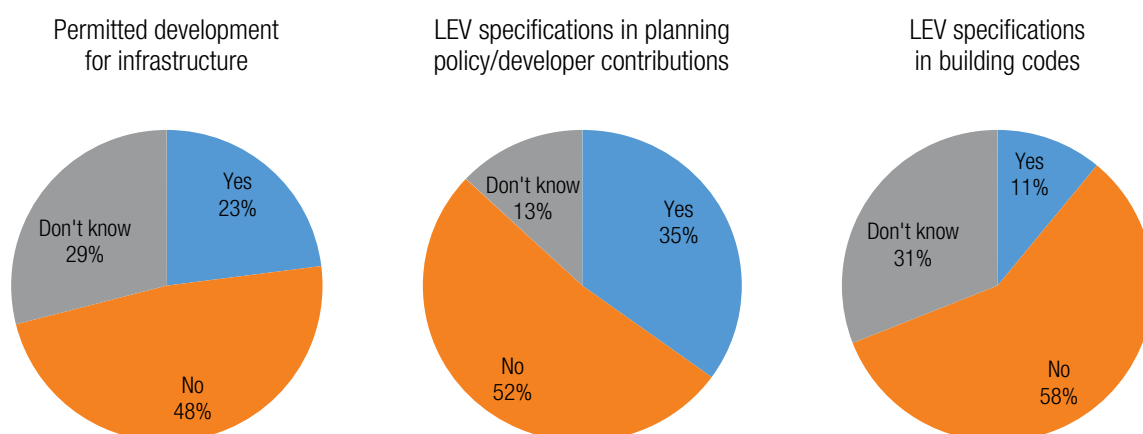
Planning authorities can encourage provisions to be made for LEV measures through **Supplementary Planning Guidance**, as part of a Local Development, or added on to planning conditions and enforced via planning permission. Non-compliant developers can be served with planning enforcement notices.

In the UK, the Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2011 has been amended to introduce **permitted development rights** for electric vehicle charging points in off-street public and private car parking areas and clarified that local authorities can install on-street electric vehicle charging points as permitted development, which should encourage increased uptake of such measures in local authorities nationwide. Similarly, in Scotland, new permitted development rights came into effect on 30 June 2014 via The Town and Country Planning (General Permitted

Development) (Scotland) Amendment Order 2014 including electric vehicle charging points in a series of amendments.

As can be seen in Figure 6, most local authorities surveyed in the research undertaken for this guide have not used planning measures to promote the uptake of LEVs to date. Developer contributions were found to be the most utilised measure, with 35% of the local authorities surveyed implementing such policies. Only 11% of surveyed local authorities include LEV specifications in building regulations.

V



3.4 CASE STUDIES Planning Conditions

By specifying the need for a minimum amount of spaces (and associated infrastructure where relevant) for ULEVs in new residential and commercial developments, local authorities can assure potential buyers that they can use their vehicles after purchase. Many examples exist of local authorities that have integrated provision for ULEVs in development ordinances. **Barcelona** for example, has an ordinance that 2% of all new off-street parking construction must be equipped with electric vehicle charging posts.

In **Vancouver** Building By-law No. 9419, § 13.2.1 Electric Vehicle Charging (effective from 2011) states that new residential constructions are required to provide an electrical circuit for home charging. The ordinance also requires multiunit dwellings to allocate 20% of all parking spaces to electric vehicles (with charge points).

Westminster City Council has a target that 100% of planning permits for all new parking spaces will be electric vehicle ready. For the development of new buildings, specifications can be made to accommodate for LEVs in the building codes.

Low Emission Zones



Image credit: The Royal Borough of Greenwich

FOCUS ON – GREENWICH PENINSULA LOW EMISSION ZONE

The Royal Borough of Greenwich was the first local authority in the country to declare a Low Emission Zone (LEZ). The Greenwich Peninsula Low Emission Zone was established in 2004 as part of the long term regeneration of the Peninsula – one of the largest regeneration sites in Europe. Planning approval for the LEZ was authorized by the Royal Borough of Greenwich via the section 106 agreement for the site.

The zone was established as part of a strategy to prohibit the most polluting vehicles, whilst promoting use of the cleanest vehicles. The low emission strategy sets a minimum Euro standard for the majority of commercial vehicles entering the designated zone.

For residential vehicles other methods such as parking controls, car clubs and information provision are being used to ensure that the tailpipe CO₂ emissions are as low as possible.

Rental Properties

California passed a law in 2014 (AB-2565 Rental property: electric vehicle charging stations) which prevents landlords from forbidding the installation of charge points where the tenant wishes to do so and is prepared to cover this expense. It applies to both commercial and residential properties where off-street parking is provided in the lease and where electric vehicles will take less than 10% of the parking spaces.

Developer Contributions

In 2014, the proposed development of a Community Stadium for **York** secured 30 electric bike and car charging points with Section 106 contributions of £20,244 to support local air quality monitoring in the vicinity of the site.

Land Development Orders

When it comes to installation of charging infrastructure for existing private dwellings, Act 186, **Hawaii** Revised Statutes Section 196-2.5 mandates that no person in the state shall be prevented from installing an electric vehicle charging system in the parking bays of multi-family dwelling or townhouse that they own. Local Development Orders can be made by a planning authority to extend the permitted development rights for particular types of development. In March 2014, **Swindon Borough Council**'s planning committee approved plans to use local development orders to speed up the construction of low carbon infrastructure, including hydrogen and electric car refuelling stations.

3.5 CHALLENGES

There are a number of challenges that need to be considered relating to planning measures to promote LEVs. These include:

- » Rapid chargers are over the 1.2 metre height limit for permitted development rights, and thus are subject to planning permission.
- » Restrictions on the utilisation of such planning measures exist for development in conservation areas.
- » Planning gain budgets might be reduced when the community infrastructure levy is introduced.

3.6 OUTLOOK

The research in this study found that a number of local authorities have not used planning measures to date to promote the uptake of LEVs. However, recent amendments to the planning law to make it easier for councils to do so could mark a change in direction here.

Placing more emphasis on ordinances and specifications to enable private installation of recharging and refuelling infrastructure in the medium-term is an area where the UK can learn a lot from international examples. And planning will play an important role in electric vehicle charging through encouraging more renewable energy development in towns and cities. Future planning guidance may need to be prepared to take into account technical as well as health and safety requirements for natural gas and hydrogen vehicle infrastructure. As highlighted in chapter 2, planning policy needs to be sensitive to the speed of vehicle and infrastructure development and technology changes, meaning that regular review of the broader landscape will help to ensure procedures are followed that are neither too far ahead of the curve, nor out-of-date.

Planning is a crucial policy area which will offer up access to a number of the other measures discussed in this report and can therefore have a very large impact on the extent to which local authorities are able to encourage the uptake of LEVs. For example, planning can facilitate the establishment of LEV-based car clubs (see chapter 9 for more information) and influence parking policy (see chapter 8) to encourage the uptake of LEVs through setting emission-based parking standards or incentives for LEVs.

Understanding the connections between these areas, and the incentives that can be promoted in each of them, and in combination is important for local authorities to deliver effective and efficient policy.

Local authorities have the autonomy and planning tools at their disposal to be bold, ambitious and future-oriented in thinking about the urban and rural landscapes of the coming decades and how to maximise the uptake of LEVs in this time.

FURTHER INFORMATION

Low Emission Strategies

<http://www.lowemissionstrategies.org/>

Planning Practice Guidance Portal

<http://planningguidance.planningportal.gov.uk/>

Local Government Association, Planning Advisory Service

<http://www.pas.gov.uk/>



Image credit: Mattbuck

4 Procurement

4.1 INTRODUCTION

Local authorities across the UK have large fleets of vehicles, many of which present immediate opportunities for LEV uptake. Local authorities also procure multiple services that could also encourage the use of LEVs as an integral part of these contracts. There is significant potential for local authorities to lead by example in the procurement of LEVs and demonstrate the viability of such vehicles to the wider community and local businesses alike.

Measures in this area can be implemented at council level, most notably via the

Procurement department, in addition to Fleet Management, Transport and Environment teams as applicable. Where additional policy is required, the involvement of directors and elected members may be necessary.

Through procurement of LEVs, local authorities and public sector organisations – such as the NHS for example – can implement wider policy objectives, while also achieving economic and environmental improvements in their fleet operations.

4.2 OVERVIEW

A range of procurement-related measures available to local government is outlined in Table 4.

Table 4 – Procurement measures to promote LEVs

| MEASURE | DETAILS |
|--|--|
| Procurement of LEVs | Local authorities purchase LEVs for use in their own fleet |
| Financing and contracting models for fleets | New public-private partnerships to provide resources and expertise to reduce operating costs and emissions in fleets |
| Setting LEV standards for procurement of transport services for local government | Procurement contracts specify/encourage the provision of LEVs for staff transport, logistics services, and public services from private hire firms and car clubs |
| Setting LEV standards for procurement of municipal services | Procurement contracts specify/encourage the provision of LEVs for municipal services such as refuse collection, street sweeping and outsourced public services |
| LEV-preferred personal leases | Employees that are entitled to subsidised leases are encouraged to select LEVs |

4.3 IMPLEMENTATION

Fleet Strategies or Sustainable Procurement Strategies

are particularly important in this area, as well as broader low emissions strategies. For lower tier authorities, it may be helpful for upper tier transport strategies to be consulted for guidance.

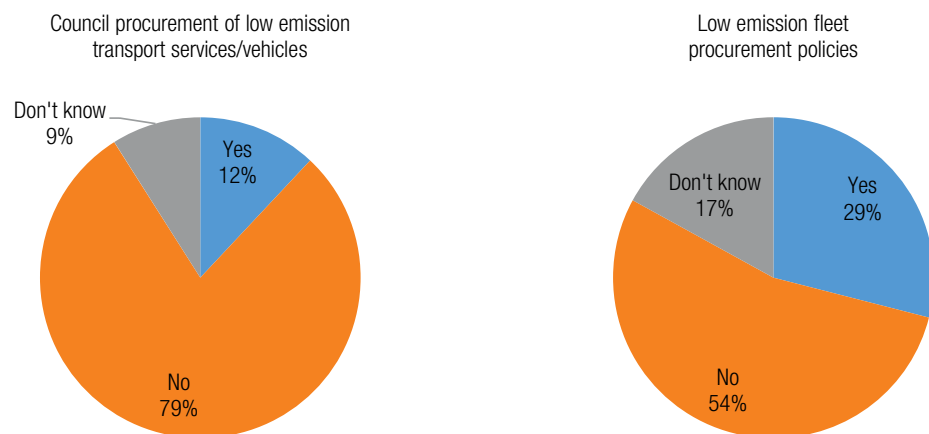
In 2012, DEFRA issued guidance on **Official Government Buying Standards** for Transport (vehicles), which states that the fleet average for new cars should not exceed 130g CO₂/km, new vans should not exceed 175g CO₂/km and that vehicles (cars and vans) must comply with Euro 5 standards. It is a central government requirement, but local authorities and other agencies are encouraged to use these standards as well.

Consulting EU law is useful for this range of measures, particularly the EU Directive on Public Sector Vehicle Emissions Standards and legislation on open procurement. The Cleaner Road Transport Vehicles Regulation may also be relevant here.

The commitment and buy-in of fleet management staff at local authorities is important for recognising the business case for LEVs and ULEVs.

As shown in Figure 7, 29% of local authorities that responded to the survey have policies to support procurement of LEVs. However, only 12% make similar provision for low emission transport services.

Figure 7 – Percentage of local authorities in the survey that had implemented different procurement measures to promote LEVs



4.4 CASE STUDIES Fleet Procurement

Dundee City Council has had an ULEV procurement policy for light duty vehicles since 2012. In early 2015, Dundee had the UK's largest local authority fleet of electric vehicles, with 60 all-electric vehicles, representing almost a quarter of the city's LDV fleet. The council's investments in electric vehicles were supported by calculating the operational savings and emissions reductions achieved by running these vehicles.

Presenting a business case for LEVs has been an important element of **Camden's** green fleet strategy. The council has set policies in their Air Quality Action Plan and prepared a Green Fleet Procurement Strategy for their own fleet and contractors vehicles, setting vehicle performance specifications in the tendering of council services. This requires cars, vans, buses and trucks to meet time-based emission standards and adopt clean fuels and technologies.

Berlin has taken steps to switch its police fleet to lower emission vehicles following the Procurement and Environmental Regulation (November 2012). Under the law, consideration must be given to life cycle costs in evaluating tenders. Euro 5 standards must be met as well as German 4 standard

for particle emissions. Diesel vehicles must be fitted with a carbon particulate filter.

Performance-Based Contracting

In 2012, Executive Order 6 was proposed by the Mayor of **Indianapolis** to deliver a 'post-oil fleet' to the city by 2025. It committed to purchasing a 500-strong fleet of electric or plug-in hybrid vehicles. The city has partnered with Vision Fleet Capital to access the necessary expertise and finance to use an innovative ESCO-type business model to develop and deploy these electric vehicles.

In **Madrid**, the city council gives preference in the tendering process to companies that can offer LEVs in their bid. This includes rental companies and vehicles for broader municipal contracts.

Joint Procurement

The City of **Stockholm** and Swedish utility company Vattenfall, together with procurement agency SKL Kommentus Inköpscental AB, have carried out a procurement effort resulting in framework agreements for electric vehicles (pure electric vehicles and plug-in hybrids) from

four different suppliers. Public bodies and private companies were invited to join the procurement consortium. This resulted in a total of 335 partners/buyers stating a requirement for an estimated purchase volume of 1,250 electric vehicles per year. The Swedish Energy Agency is providing financial support by compensating for the additional cost of the first 550 vehicles that are bought through the procurement framework contracts. This means that organizations will receive up to 50% funding of the additional cost to a maximum SEK 100,000 (approximately £8,690). The additional cost is the difference between the cost of an electric vehicle and its closest counterpart among combustion

engine vehicles. Already, 500 vehicles have been purchased, with another 300 being evaluated. The overall budget support is about SEK 248 million (£21.5 million).

Suppliers

Both **Sefton** and **Leicester** councils have embedded LEV specifications into their procurement policy. In Leicester, the city council considers vehicles that meet Euro emission standards or equivalent at the time of purchase. It is also actively investigating the suitability of low carbon vehicle technologies where best value can be demonstrated.



Image credit: Transport For London

FOCUS ON – LONDON: PROCUREMENT

The Mayor of London stated in his Air Quality Strategy 2010 that the Greater London Authority (GLA) group and boroughs would work together to promote best practice procurement for cleaner vehicles using the combined purchasing power of the public sector. Transport for London (TfL) and GLA established vehicle and infrastructure procurement frameworks to lower costs and simplify the purchase process. Other organisations, such as local authorities, could also take advantage of both London frameworks and realise the financial benefits delivered by bulk procurement.

This framework expired in 2015 so TfL is now looking into implementing a new procurement process, open to more suppliers, to provide best value for procurers.

4.5 CHALLENGES

Existing **tendering and contract cycles** can restrict opportunities to implement new procurement activities. Therefore, considering changes in the medium-term and allowing for a transition to a new procurement regime could allow an appropriate adjustment time and embrace more existing contracts as they come up for renewal.

Analysis, justification and approval of **revenue impact** is important in order to gain acceptance for such measures, especially where procurement may currently focus on capital costs and initial investment instead of running costs and savings to be made. Similarly, steps should be taken to ensure that the benefits of such policies are understood in the broader context across the local authority.

Meeting the terms of more specific procurement contracts can prove difficult for small providers due to the costs involved – this may result in a more restricted supply chain and less competition in tender bids and could even distort the market.

A key challenge related to joint procurement is that it works best when multiple orders are being made for a single **vehicle specification**. However, the reality is that different organisations invariably have multiple different specifications of vehicles that they require for their fleet, making the process more difficult to manage and reducing the savings achievable from bulk buying a single vehicle specification.

4.6 OUTLOOK

Public sector leadership can help to create markets for new LEVs. This applies both in terms of giving automotive manufacturers confidence in long-term demand for these vehicles, as well as exposing employees and other organisations to the performance and benefits of LEVs. Emphasis has been placed on integrating electric vehicles into local authority fleets in recent years, although some local authority fleet managers have acknowledged that other alternatively-fuelled LEVs – such as LPG, CNG and biomethane – can also play a role.

The volumes at which local authorities and other public sector organisations procure vehicles can provide opportunities to negotiate favourable contracts. This was confirmed in the research undertaken for this study, with a number of local authorities reporting that they had been offered a significant reduction in the purchase and lease price of electric vehicles. Moreover, the lower operating costs achievable

with LEVs can further strengthen the economic justification for making such investments.

In addition to a local authority's own fleet, there are also opportunities to work with suppliers to reduce the emissions and cost associated with delivering public services. Integrating emissions based performance standards in procurement will help achieve further uptake of LEV by contractors. Provision of infrastructure for contractors could also help encourage the adoption of cleaner vehicles.

Greater uptake of LEVs will be supported by decision-making based on the total cost of ownership compared to fossil fuelled vehicles. Similarly, organisations placing a greater store on the environmental and social impacts of their transport operations, and developing supportive procurement policies to reflect this can play a major role in increasing the uptake of LEVs.

FURTHER INFORMATION

DEFRA, Sustainable procurement: the GBS for transport (vehicles)

<https://www.gov.uk/government/publications/sustainable-procurement-the-gbs-for-transport-vehicles>

Clean Fleets, Procurement clean and efficient road vehicles

http://www.cleanfleets.eu/fileadmin/files/documents/Publications/Clean_Fleets_Guide_-_Final__Nov_2014.pdf

Transport for London, Sustainable fleet management guide

<http://www.tfl.gov.uk/cdn/static/cms/documents/fuel-and-fleet-management-guide.pdf>

Cenex, Low Carbon Vehicle Public Procurement Programme (LCVPPP) Reports

<http://www.cenex.co.uk/press-releases/lcvppp-summary-report/>



Image credit: ESB

5 Infrastructure Provision

5.1 INTRODUCTION

The provision of new recharging or refuelling infrastructure is a key focus for many local authorities in the promotion of LEVs. These measures are closely linked to planning and parking policy, which are considered separately in chapters 3 and 8 of this guide.

The general availability and ease of access of this infrastructure can greatly influence the convenience and confidence associated with using an alternatively-fuelled LEV. For electric vehicles, this not only includes public infrastructure, but also the ability to recharge at work and at home. This can remove the need to regularly make a special journey or detour to refuel, ultimately making electric vehicles more convenient to use than fossil fuelled vehicles. Public

charge points are important to giving drivers comfort over the range that can be achieved

Local authorities have an important role in providing infrastructure to serve taxi and van fleets. In addition to electrification, these vehicles can also use alternative fuels such as natural gas, biomethane, LPG and hydrogen. Such infrastructure can be flexible and serve a variety of LEV fleets.

Measures relating to infrastructure provision are generally implemented at local authority level via a combination of the Planning, Parking, Environmental and Transport teams. Public private partnerships are also often used to facilitate LEV infrastructure development.

5.2 OVERVIEW A range of infrastructure provision-related measures available to local government is outlined in Table 5. Some of the measures facilitate the physical installation of new infrastructure; others have to do with providing access to this infrastructure. Measures associated with planning policy framework are considered in chapter 3 and parking measures are considered in chapter 8.

Table 5 – Infrastructure provision measures to promote LEVs

| MEASURE | DETAILS |
|--|---|
| Discounted electricity for recharging | Electric vehicle drivers have access to recharging at reduced cost/free |
| Access to refuelling/recharging infrastructure | Infrastructure is provided for a range of LEVs as they enter the market |
| Grants/loans | Grants or loans to local businesses to support installation of recharging/refuelling infrastructure |

5.3 IMPLEMENTATION As with parking measures, TOs are a key mechanism for infrastructure provision.

More information on the development aspects of infrastructure provision can be found in chapter 3 on planning. This explains how planning can be used to streamline the installation of infrastructure, and avoid the associated delays and costs of full applications. Measures include:

- » Permitted development rights can make it easier to install charging points. This includes on-street charging points and wall mounted electrical outlets and stands for recharging electric vehicles within off-street parking areas.
- » Through the New Road and Street Works Act (1991) it is possible to provide notification of prior approval for setting up charge points, rather than necessitating full planning applications.

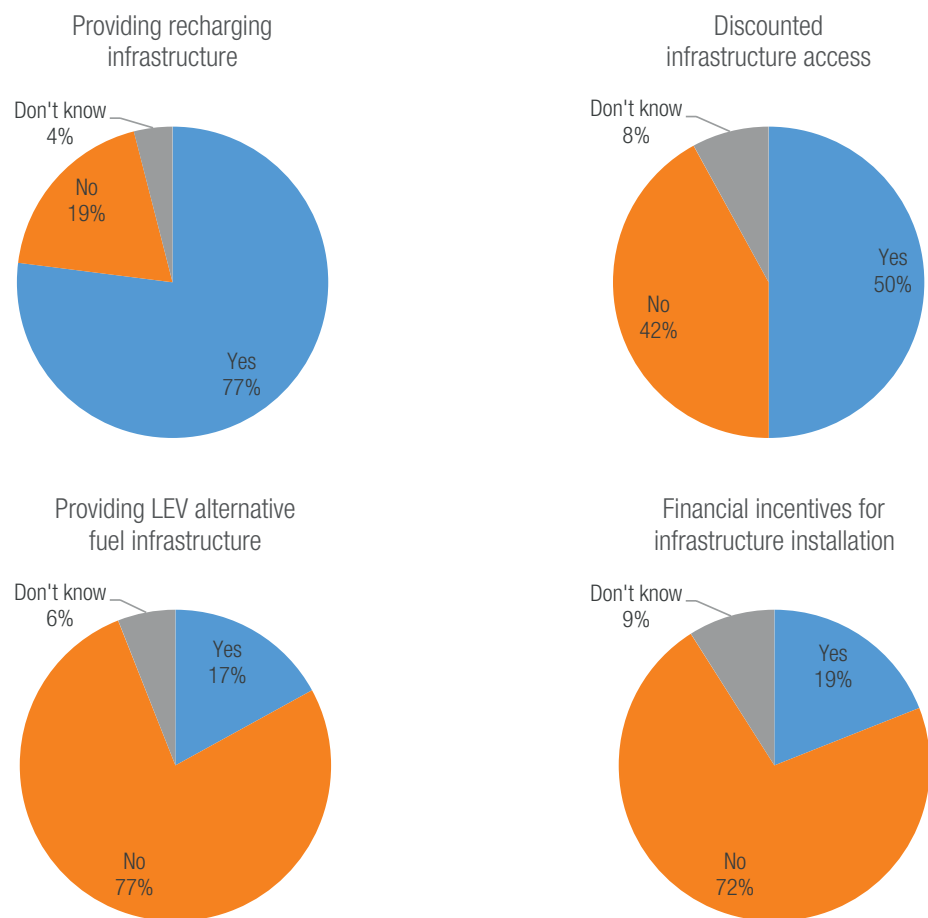
Public-private partnerships can offer an effective means to implement infrastructure, providing access to necessary expertise and funding. Working with the private sector can also be necessary in providing infrastructure on privately owned land, such as shopping centres, supermarkets and other key destinations. Local authorities

can also use their own land and fleet depots to install infrastructure that can serve a range of LEVs, including taxis and vans, but also buses and trucks.

The UK and devolved governments have provided much of the funding for infrastructure installation and local authorities have also contributed funds from their own budgets. Local Implementation Plans and Local Transport Plans can be leveraged for infrastructure development, as can air quality grant funding.

As can be seen in Figure 8, research undertaken for this guide found that 77% of the local authorities surveyed are providing recharging infrastructure for electric vehicles. About 50% offer discounted access to recharging and refuelling infrastructure, around 19% offer grants or loans to support installation of recharging/refuelling infrastructure. With regards to other LEV refuelling infrastructure, only a small number of local authorities surveyed (less than 20%) in this research were implementing such measures. It is, however, expected that more alternatively-fuelled vehicles will begin to enter the market in the coming years and hence additional infrastructure will eventually be required.

Figure 8 – Percentage of local authorities in the survey that had implemented different infrastructure measures to promote LEVs



5.4 CASE STUDIES **Discounted Electricity for Recharging**

In **Glasgow**, electricity for charging electric vehicles is free, and whilst being recharged, parking on or off-street is also free. Charges apply if the vehicle is not being charged. Users need a swipe card to activate the chargers, which can be bought for £20/year or borrowed for one-time access if the parking facility is at a manned site. Some bays in Glasgow are dual purpose, reserved for both electric vehicles and/or disabled 'blue badge' holders.



Image credit: Source West, Bristol City Council

FOCUS ON – BRISTOL AND SOURCE WEST: NETWORK OF ELECTRIC VEHICLE RECHARGING

Bristol City Council has installed a network of electric vehicle charging points that are currently free to use. The network was established through the city's General Air Quality Management Strategy and was guided by national policy to increase the use of LEVs. With funding from the UK Department of Transport and the EU, Bristol has joined forces with other councils in the West Country (Bath and North East Somerset, and the counties of South Gloucestershire, North Somerset and Gloucestershire) to introduce a scheme called Source West to ensure that the charging network is interoperable in the region. Such a scheme demonstrates that it is possible to link up local schemes to avoid a patchwork of initiatives from developing.

In addition to providing recharging infrastructure, Source West also provides information about electric vehicle ownership and following the successful incentive of offering free access to the first 150 businesses and individuals signed up to the scheme, this offer has been extended to an additional 150 users.

Access to Recharging/ Refuelling Infrastructure

The London Borough of **Camden** operates a variety of alternatively-fuelled vans such as LPG, electric, hybrid and the largest biomethane van fleet in the UK. The council operates a compressed biomethane gas refuelling station at their depot in central London. The station supplies biomethane to several companies operating CNG vans.

Camden's fleet depot also has a fast-charging point to encourage local business fleets to invest in electric vans. For several years the council operated a mobile hydrogen fuel cell generator that was used to provide clean power at the council transport events. Financial support for Camden's low emissions fleet initiatives has been sourced from local and national funding streams in their Local Implementation Plan and DEFRA's Air Quality Grant.

Strategic Infrastructure Planning

Birmingham City Council's Blueprint for Low Carbon Refuelling Infrastructure was a mapping study to understand the future needs for low emission fuel infrastructure – including electricity, hydrogen and gas vehicle refuelling. Stakeholder consultation workshops have been carried out to gain insight on siting, fuel specification and vehicle operation issues, as well as some of the constraints surrounding

fuel distribution. The quantification of CO₂ emissions following investment in refuelling stations was undertaken in the analysis and recommendations have been made for the initial steps the council can take to support the delivery of the plan. This is an example of evidence-based policy development and in setting a strategic vision for LEV infrastructure that will not only influence the council's own procurement, but will also encourage the wider uptake of LEVs in Birmingham.

5.5 CHALLENGES

There are a number of challenges which relate to the provision of recharging and refuelling infrastructure which include:

- » Traffic Order legislation in its current form restricts on-street electric vehicle charging due to it not being possible to assign spaces to individuals.
- » A lack of available kerb space and opposition to the removal of waiting and loading provision can restrict opportunities for on-street infrastructure.
- » Even where funding is available, it can be restrictive in scope, e.g. only to be used on capital expenditure for infrastructure itself and not for the ongoing maintenance and operation.
- » There is a movement to reduce "street clutter" in certain local authorities which can make it difficult to install additional infrastructure.
- » The local grid capacity/need for additional substations can significantly increase the cost and limit opportunities to install rapid charge points.
- » The provision of charge points and methods of access and payment are inconsistent between authorities and this is a source of frustration for some electric vehicle drivers.
- » Where infrastructure is provided in car parks that are closed at certain times of the day this also restricts access to these recharging/refuelling stations.
- » Communities that have high numbers of high density housing, such as flats and tenements, are faced with the challenge of providing access to charge points for residents that do not have dedicated parking spaces.
- » The UK government's Carbon Reduction Commitment places a requirement on local authorities to reduce their electricity use and to pay CO₂ credits for the energy used. Developing public electric vehicle charging infrastructure needs to be factored into a council's overall obligations around energy use in this sense.

5.6 OUTLOOK The main infrastructure focus for many local authorities in recent years has been on providing public charge points for electric vehicles. Funding for this has mainly come from the UK government and devolved administrations, but recent years have also seen an increase in privately funded charge points.

Much of this early deployment was focused on providing large amounts of standard 3-7kW public charge points across towns and cities. Some of these charge points were installed in central locations providing the twin benefit of giving electric vehicle drivers access to prime parking locations, as well being highly visible and hence supporting public confidence. Rapid charging infrastructure is also becoming increasingly more commonplace, which is of benefit to all EV drivers, but particularly to business fleets and taxis that opt for a switch to an electric fleet.

As a legacy of the public funding, and also the time taken to develop effective commercial models for paid access to charge points, many local authorities still offer free parking and recharging in 2015. This is a benefit widely appreciated by many electric vehicle drivers, but it is recognised that this is not sustainable in the long-term for local authorities. While the cost of providing electricity is marginal, the costs to maintain charge points, fund the provision of back office services and the loss of revenue from parking charges mean that many local authorities are likely to phase out this incentive in the near future. Moving towards more commercial models for charge point provision creates a challenge to ensure that infrastructure is not just provided in the highest revenue generating locations

and that the needs of electric vehicle drivers in more rural locations are also met.

Local authorities also have opportunities to develop refuelling infrastructure to serve LEVs capable of running on gaseous fuels, such as taxis and vans (as well as public transport and trucks). Supporting the growth in markets for alternatively fuelled vehicles is unlikely to require blanket provision of charge points and refuelling stations, which would be both unnecessary and uneconomic. Furthermore underutilised infrastructure can actually damage public confidence. Therefore local authorities are increasingly focusing on providing infrastructure in the places where it is most needed. This relates to the locations where it will be most used, and where it enables drivers to make the journeys that they wish to make.

In towns and cities where a large number of residents do not have access to dedicated parking, a particular challenge is to develop infrastructure solutions that enable residents of these properties to use an electric vehicle. This is likely to be a combination of on-street, workplace and rapid charging solutions.

Infrastructure for LEVs also closely relates to electricity networks. The ability of local grids to accommodate clusters of electric vehicle charging is a key concern for Distribution Network Operators (DNOs). Similarly the provision of several rapid chargers at one location can require expensive upgrades to grid infrastructure. Local authorities can both work with to understand the requirements necessary, but also to encourage the exploitation of renewable energy to help manage the increased load.

FURTHER INFORMATION

Office of Low Emission Vehicles – Making the Connection: The Plug-in Vehicle Infrastructure Strategy
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/39866/plug-in-vehicle-infrastructure-strategy.pdf

European Parliament/Council, Directive of the European Parliament and of the Council on the Deployment of Alternative Fuels Infrastructure – Directive 2014/94/EU
<http://register.consilium.europa.eu/doc/srv?l=EN&f=PE%2079%202014%20INIT>



Image credit: GreenFleet

6 Education and Communication

6.1 INTRODUCTION Local authorities have an important role in building confidence and awareness in LEV technologies. This requires engagement with individuals, organisations and key influencers in the public and private sector.

A number of local authority departments may be involved in these measures, including Fleet Management, Transport, Communications, and Environmental Teams. National funding can also be provided for local awareness raising campaigns.

6.2 OVERVIEW A range of education and communication-related measures available to local government is outlined in Table 6.

Table 6 – Education and communication measures to promote LEVs

| MEASURE | DETAILS |
|--|--|
| Educational and promotional activities | Awareness campaigns/events to promote the benefits of LEVs |
| Advisory services | Providing tools and information on the use of LEVs |
| 'One-stop shop'/promotion office | A single physical location to access more information, advice, guidance, permits and access cards for infrastructure |
| Information exchange | Measures to share/access information internally and externally to a local authority |
| Demonstration | Offering 'try and drive' experiences for local businesses and the public |

6.3 IMPLEMENTATION Many local authorities also have well established communications channels and expertise that can be used to disseminate messaging on LEVs. This is often linked to awareness raising work linked to air quality and sustainable travel.

There is also a wealth of **educational material and resources** provided by various organisations. This includes OLEV's GoUltraLow campaign, advice provided by the Energy Saving Trust, materials produced by manufacturers of LEVs and the Low Carbon Vehicle Partnership.

Focusing activities towards **specific user groups**, e.g. schools, bus operators, businesses and taxis companies, can be a more efficient and easier way to affect change than focusing events on individuals. Connecting with large non-governmental organisations, such as the

NHS for example, could prove an important policy making tool – in this case, helping people make the health connection with LEVs, and influencing behaviour with new measures.

Peers and trusted advocates are often key in influencing people's behaviours and therefore are likely to be a valuable asset in encouraging further adoption of LEVs. This can be achieved by promoting case studies and by making connections between similar organisations to share experiences of successfully using LEVs.

Other promotional or educational measures could include: green driving courses for staff; demonstrator fleets such as branded waste collection vehicles; partnership with vehicle manufacturers; and websites providing advice and technical information.

6.4 CASE STUDIES Education

In 2008 **Camden** organised an LEV event for business to provide advice from fleet experts on the cost and environmental benefit of different LEVs. In 2009, Camden also organised a Green Motor Expo for the public and local businesses, which showcased a range of alternatively-fuelled LEVs (cars and vans) including electric, hybrid, biomethane and hydrogen fuel cells. Visitors were able to test drive the vehicles at the event. And in 2013, Camden created an electric car guide video in partnership with the Green Car Guide website. The video explains how electric, plug-in hybrid and range extended cars operate, their cost and environmental benefits.

Fife Council is working in partnership with local organisations on an outreach programme that demonstrates the link between renewables as a source of energy and transport through school workshops. By engaging the children with the technology, including electric vehicles, they can spread the word on the benefits to parents and family. The workshops have engaged 30,000 school children and feedback has been positive.

The **London** Hydrogen Partnership has undertaken various activities with school children to raise awareness of hydrogen fuel cell vehicles including the London School's Hydrogen Challenge.



Image credit: Scottish Borders Council

FOCUS ON – SCOTTISH BORDERS COUNCIL EV ROADSHOW

The Scottish Borders Council has held a number of electric vehicle roadshows inviting members of the public and local business to speak to council staff and vehicle manufacturers, as well as test drive a selection of electric vehicles. The scheme is run in partnership with the Energy Saving Trust and is led by the Commercial Services department of the Council.

The kind of information shared at these events includes:

- » The different types of EVs available
- » Battery charging speeds
- » Fitting home sockets for charging, and the associated grants available
- » The national charging network across Scotland and into Northumberland
- » Public rapid chargers, such as the ones at Scottish Borders Council's Headquarters and in Peebles
- » Leasing electric vehicles
- » Insurance

Promotion

Östersund in Sweden hosted an electric car rally to increase media attention and widen public awareness on LEVs.

Rotterdam has an Electric Vehicle Centre which offers companies and individuals an opportunity to test drive a range of vehicles and experience electro-mobility away from the pressure of a car show room.

The centre also offers information about grants, charging, insurance and leasing.

Demonstration

Both the London Boroughs of **Westminster** and **Camden** have offered free electric vehicle trials for businesses.

6.5 CHALLENGES

Measures relating to education and promotion are often relatively straightforward to implement and are subject to fewer challenges than other measures to promote LEV uptake. Nevertheless, such measures are invariably dependent on there being sufficient **political will** and buy-in and an **available budget** to communicate messages effectively.

The challenge for these initiatives is not just to simply give people more information, but also to address **negative perceptions** that people may have about LEV technologies. Therefore, helping to dispel scepticism, bias, misconceptions and concerns should also be a

priority for communications activities, not just around the specific vehicles and technologies, but also around some of the policy measures that may be implemented. Engaging in a positive dialogue about the changes to the town or city that might take place may be one of the most convincing means of encouraging uptake.

Enlisting and engaging with experts in such education and communication activities may be useful to directly address specific fears or concerns that members of the public and businesses may have.

6.6 OUTLOOK

The successful implementation of almost all of the measures discussed in this guide will be greatly impacted by the level of public awareness and buy-in. It is therefore important that LEV messages are communicated and reinforced at the local level.

To maximise the influence and effectiveness of these measures it is essential that they are promoted to as wide an audience as possible, with the associated benefits and opportunities clearly explained.

Education and outreach activities will also address the fact that a low level of awareness and understanding of LEVs will undoubtedly temper demand. For an individual or organisation to consider using an LEV they first need to know that this is an option.

Moreover, widespread awareness of the imperatives for LEVs will also help to encourage uptake. This can be achieved by promoting the benefits of LEVs as well as the negative impacts of road transport emissions on human health and the environment. This raises a related requirement to help people to understand how LEVs can fit with their lifestyles or business needs and how they would go about switching. At the basic level this requires provision of information on issues such as vehicle use, vehicle options, range, incentives, infrastructure, costs and potential savings.

To ensure that the information provided is accurate, local authorities need to maintain access to the latest knowledge and remain engaged with the fast pace of technology developments in the LEV sector. This will be facilitated by partnerships with a range of public and private stakeholders. These partnerships will in turn offer the potential to engage, enthuse and inform individuals and organisations across the UK.

Local authorities have a key role to play in the provision of information regarding LEVs and providing information about the capabilities of different technologies, incentives (fiscal and practical), location of infrastructure, costs and environmental benefits which could aid in educating consumers about new technologies. Local authorities can influence both private buyers and fleets. Such measures would be complimented by demonstration trials and allow residents and businesses to experience these types of vehicles. Making links between the environmental, health and cost benefits of LEVs should be highlighted in awareness raising campaigns.

Social media is becoming an increasingly popular method for communicating information to the public. Local authorities should also explore how evolving communication methods can be exploited to promote LEVs.

FURTHER INFORMATION

Go Ultra Low

<https://www.goultralow.com/>

VCA Car Fuel Data

<http://carfueldata.direct.gov.uk/>

LowCVP, Electric vehicles: Improving consumer information to encourage adoption

<http://www.lowcvp.org.uk/assets/reports/Electric%20vehicles%20Improving%20consumer%20information%20to%20encourage%20adoption%20%28ceeee%20paper,%20June%202013%29.pdf>



Image credit: Norsk Elbilforening

7 Road Charging and Access

7.1 INTRODUCTION An important incentive to encourage drivers to opt for a LEV is to enable them to save time. Giving them access to dedicated road space, such as bus corridors or high occupancy vehicle lanes, can speed up travel time by avoiding congestion. Giving LEVs free access to areas of a town or city where more polluting vehicles are charged can also offer financial savings, convenience and status benefits. Low emission zones are gaining increasing attention as means to accelerate the introduction of cleaner vehicles. International experience – in California and Norway for example – demonstrates that road access has

been a very influential measure in incentivising the purchase of LEVs and is likely to be significant for UK local authorities to consider.

Road charging and access measures can be implemented by the local authority and can involve a range of departments including Parking Services, Sustainable Transport, Planning, and Environmental Health. External agencies including local Passenger Transport Executives and public transport operators may also have a role in implementing such measures, as well as the Highways Authority in considering in the regional context.

7.2 OVERVIEW

Table 7 summarises the various road charging and access measures considered in this chapter.

Table 7 – Road charging and access measures to promote LEVs

| MEASURE | DETAILS |
|---|--|
| Access to bus lanes/corridors | LEVs given permission to drive in bus lanes/corridors |
| Access to high occupancy vehicle lanes | LEVs given access to high occupancy vehicle lanes even with a single driver |
| Low emission zones/ultra low emission zones and exemption from congestion charges | Charges/restrictions on high emitting vehicles accessing areas of city/discounts or no charge for LEVs |
| Discounted road charges or tolls for bridges/tunnels | Discounts or no charge for LEVs where conventional vehicles are charged |

7.3 IMPLEMENTATION

Traffic Orders (TOs) (or Traffic Regulation Orders – TROs) are used as a mechanism to regulate, restrict or prohibit the use of a road or any part of the width of a road by vehicular traffic.

Road access restrictions may also be enforced by the installation of **rising bollards** to allow freight delivery and/or LEV-only access at certain times of the day.

Providing access to **bus lanes and corridors** requires updates to existing signage, with LEVs defined as a separate class of vehicles. Experience of opening up lanes to powered two-wheelers and taxis can provide a basis for such amendments. These changes may also require that local authorities standardise hours of operation of bus lanes, bus driver training and potential changes to national legislation.

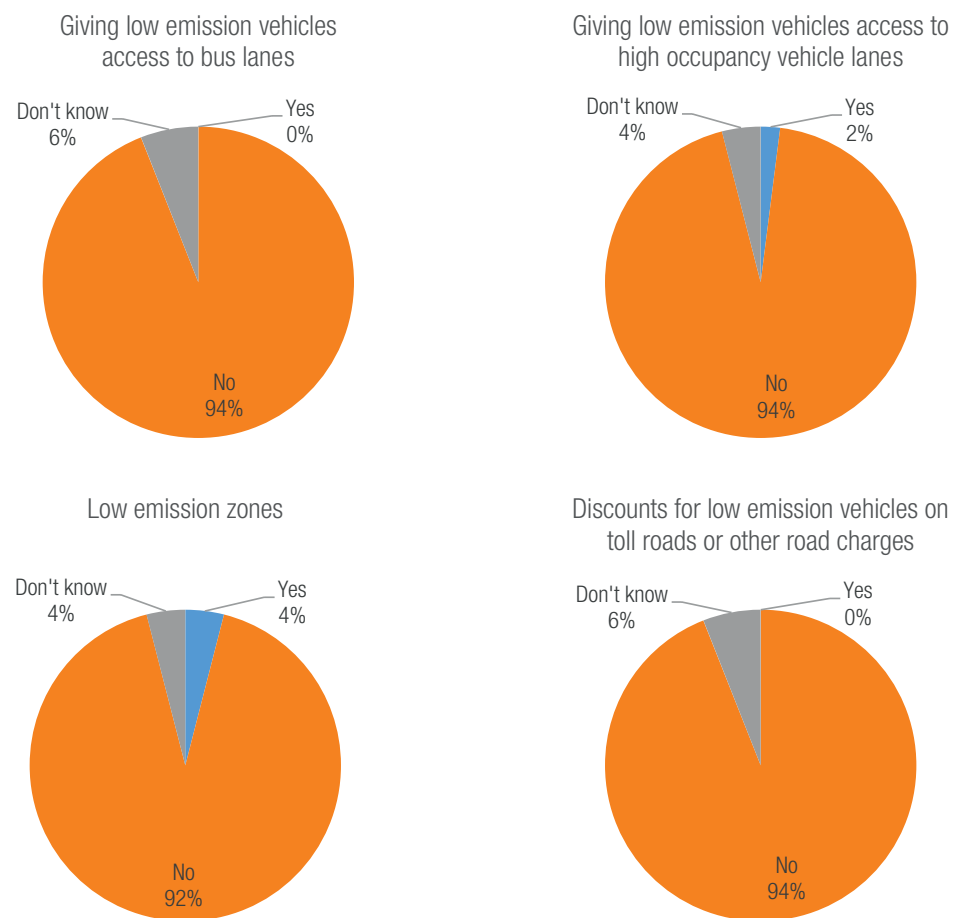
Authorities that already have CCTV cameras or other **enforcement infrastructure** in place in bus lanes might find it easier to win approval for implementing such an incentive.

Low Emission Zones commonly set entry requirements based on Euro standards for certain types of vehicles and can either impose charges on high emitting vehicles or prohibit their access altogether.

In the UK context, there are a limited number of **toll roads** that are locally administered, but as with the other forms of preferential access discussed in this section, ensuring that all relevant roads were operating under standard terms would be a priority step.

As shown in Figure 9, the survey data shows that road access and charging measures are scarcely implemented by local authorities. No local authorities cited any measures regarding access to bus lanes or discounts for LEVs on certain road charges. Only 4% of the local authorities in the survey stated that they had low emission zones in operation.

Figure 9 – Percentage of local authorities in the survey that had implemented different road access and charging measures to promote LEVs



7.4 CASE STUDIES **Bus Lanes and Corridors**

In September 2014, the **German Government** signed the Elektromobilitätsgesetz into law. This new mandate will give electric vehicles new number plates (or stickers for vehicles registered outside Germany) and will give municipalities access to a series of measures, access to bus lanes is just one. The law will come into effect early in 2015 and run until 2030. Decisions about which measures will be implemented locally are to be made by each municipality.



Image credit: Urban Foresight

FOCUS ON – OSLO: PREFERENTIAL ACCESS FOR LEVs

Norway has adopted a very comprehensive combination of measures over the last 20 years to transform its car market. As of February 2015, there are almost 45,000 all-electric vehicles registered in the country and a further 3,000 more plug-in hybrids. Oslo accounts for 20% of these vehicles. Air pollution in the cities, particularly Oslo, was a major driver behind the switch. All electric vehicles have registration plates that start with EL, so that they can be identified.

Some of the important measures, such as the preferential taxation rates for electric cars, have been implemented at the national level, but there are a number of the other essential benefits, such as free parking and charging facilities, which are managed in the city.

Two of the most popular local measures to promote electric vehicles have been to give them access to the bus lanes in Oslo and to provide exemption from toll road charges (electric vehicles are also permitted to use bus lanes and free toll roads across Norway). Local incentives have been a major factor in the growing popularity of electric vehicles in Norway. Motorists in Oslo have reported saving an hour on their daily commute by driving in bus lanes and by gaining easy access to dedicated electric vehicle only parking lots across the city.

These local incentives are administered and funded by the municipalities themselves. A cross-party political agreement set the intention for incentives to remain until 2017 or when 50,000 electric vehicles are registered in Norway. However, as the market grows the continuing viability of certain measures is to be kept under review. One such example is access to bus lanes, with cities such as Oslo monitoring local conditions to ensure any impact on public transport, traffic flow and congestion remains marginal.

High Occupancy Vehicle Lanes

Since 2010, in **Ontario**, Canada, green licence plates have been used to determine access rights on the HOV highway lanes and this measure will be in place until June 2015. Only plug-in hybrids and pure electric vehicles are eligible for the plates.

In **California** a window sticker determines access to the lanes. Other states use 'clean fuel' plates. States such as including Virginia and Maryland also have schemes in place for HOV access.

HOV lanes are less common in the UK. **Leeds**, for example, has had a HOV lane on the A647 since 1998.

Congestion Charging and Low Emission Zones

London's congestion charge, which has been in place since 2003, is a weekday fee charged for entry into the zone between 7am and 6pm, Monday to Friday. The standard charge is £11.50. The Ultra Low Emission Discount was introduced in 2013 and provides a 100% discount for cars or vans which emit 75g/km or less of CO₂ and that meet the Euro 5 standard for air quality. This discount replaces the previous Greener Vehicle Discount (GVD) and the Electrically Propelled Vehicle (EVD), reflecting the improving emissions standards of vehicles on the market.

Following a public consultation, the Mayor of London confirmed that an Ultra Low Emission Zone would be introduced in the capital in 2020 to encourage the use of newer, cleaner vehicles. It will operate 24 hours a day, 7 days a week in the current congestion zone. All vehicles (cars, motorbikes, vans, minibuses and lorries) will need to meet exhaust emission standards or pay a charge to enter the zone. Emissions standards have been set based on type, fuel and age of vehicle. Concessions will be granted for residents in

the zone for 3 years, after which time they must pay the charge if their vehicle does not meet the zone's emission standards.

Milan is currently trialling a congestion scheme, having formerly had a system linked to pollution charges. It is the first city to be able to compare the experience between two schemes.

In 2006, the 'Umweltplakette' was developed in Germany through legislation designed to address air pollution. All drivers in the country are required to have a sticker on their cars entitling them to enter the Umweltzone in many German towns and cities. **Berlin**, **Cologne** and **Hannover** were the first cities to introduce restricted zones in 2008 but many more cities and towns have subsequently introduced Umweltzonen. Initially the stickers were colour coded: a green sticker denotes that the vehicle meets the highest environmental standard; a yellow sticker is for a less compliant vehicle; and red stickers are reserved for the dirtiest cars. Since introduction, yellow and red stickers have been phased out. Signs in the cities clarify which sticker a car must have in order to enter the Umweltzone. Cars without a sticker are refused entry to the city regardless of the vehicles' emissions.

Utrecht banned large heavy vehicles in the city centre and subsequently a small-scale electric freight distribution scheme has been set up to manage the last mile distribution. Cargohopper, is a small electric-powered van, which connects to multiple trailers to form a road train, provides two way services between the distribution centre and is eligible for entry into the city centre.

Toll/Road Charge Discounts

The NJ EZ-Pass offers drivers of vehicles that have a fuel economy of 45 MPG or higher a 10% discount on off-peak **New Jersey** Turnpike and Garden State Parkway toll rates.

7.5 CHALLENGES

Enforcement is a major challenge for road charging and access measures. The difficulty in identifying LEVs that qualify for particular measures is a primary consideration here. Whilst automatic number plate recognition (ANPR) cameras are the easiest means to manage enforcement, they can be costly to establish.

Public and political resistance to the implementation of such measures can also sometimes be an issue. In some towns and cities businesses have voiced concerns on the potential effects on trade of any such restrictions. Similarly, providing LEVs with access to bus lanes has raised concerns related to safety and the possible disruption this could

cause to bus services. London conducted a review and deemed the measure untenable> however, experience elsewhere has shown that mitigating steps, such as the timeframe/ vehicle threshold set on the incentive in Oslo, can manage negative impacts on existing services. York similarly held a feasibility study for a low emission zone which suggested it was not the right measure for the city. These experiences highlight that not every measure will be feasible in every city, but with careful consideration, particular measures may work in particular contexts and local authorities should not be dissuaded from trying a range of measures and learning from the experiences elsewhere and drawing on their own knowledge of their particular town or city.

7.6 OUTLOOK

Road charging and access measures are widely seen to offer considerable benefits in promoting uptake of LEVs in the early market. Such measures offer both time and cost savings, as well as additional status to LEV drivers. Because the measures discussed need careful consideration, feasibility studies and public consultation may inform the optimal approach to more widespread implementation.

The Norwegian case has shown that access to bus lanes has been one of the most highly valued benefits in promoting the impressive uptake of ULEVs. Moreover, Norwegian cities have shown that enforcement and monitoring mechanisms can be put in place to ensure that the benefits of such measures are only afforded to the rightful beneficiaries and that disruption to bus services is limited. This incentive has been introduced in Norway with the expectation that it will be phased out before such problems arise, and it can therefore only be considered a short-term benefit to boost the early market for ULEVs.

In the UK very few areas outside of London currently have road charging measures in place. Public rejection of congestion charging schemes in referenda held in cities such as Manchester and Edinburgh

also indicate that there will be challenges in implementing this type of measure. However, the experience in cities such as London shows that road charging and access restrictions can be successfully delivered in the UK and in very different locations.

Air quality concerns have led many UK local authorities to formally explore the feasibility of implementing low emission zones. The Scottish Government is also currently developing a national strategy for low emission zones. Low emission zones can play a role in the adoption of cleaner fossil fuel LEVs through access requirements related to the latest Euro standards. Incentives can be integrated with low emission zones to encourage use of ULEVs by private buyers and fleets.

A key focus in successful deployment of road charging and access measures will be in making it straightforward for the public to understand the different restrictions, conditions and charges. This requires effective outreach and communication. It will also be greatly supported by standardisation and partnership working to implement targeted measures and maximise the associated benefits for LEV uptake.

FURTHER INFORMATION

Norwegian Centre for Transport Research 'Electromobility in Norway - experiences and opportunities with Electric vehicles'

<https://www.toi.no/getfile.php/Publikasjoner/T%C3%98I%20rapporter/2013/1281-2013/1281-2013-elektronisk.pdf>

Transport for London, Congestion Charging

<https://www.tfl.gov.uk/modes/driving/congestion-charge>

Transport for London, Ultra Low Emission Zone

<http://www.tfl.gov.uk/modes/driving/ultra-low-emission-zone?cid=ultra-low-emission-zone>

Urban Access Regulations in Europe

<http://www.urbanaccessregulations.eu/home>



Image credit: Urban Foresight

8 Parking

8.1 INTRODUCTION

Parking is an important policy area for incentivising LEV uptake because it has a direct impact on drivers' behaviour and choices. The parking measures discussed in this chapter can: save drivers money where discounts or free parking are offered; save time by providing easy access to dedicated parking and preventing the need for searching in multiple locations; and offer convenience and status, by locating LEV spaces closer to amenities. Given these benefits, parking measures are likely to be highly effective.

There is much that can be done by local authorities in this area because parking policy is administered at the local level. An overarching objective for such measures, however, is that parking policy is consistent and contributes to overall transport policy.

8.2 OVERVIEW A range of parking-related measures available to local government is outlined in Table 8. The inclusion of recharging/refuelling facilities with parking spaces is considered in chapter 5.

Table 8 – Parking measures to promote LEVs

| MEASURE | DETAILS |
|---|--|
| Discounted on- and off-street parking for LEVs | LEVs permitted to use public parking facilities free or at a reduced cost |
| Dedicated LEV parking (not including recharging) | LEV-only car parking spaces that do not include charge points |
| Discounted residential parking permits for LEVs | Cost of parking permit reduced or waived for LEV owners |
| Reduced waiting time for parking permits for LEVs | Priority for parking permit applications given to LEV cars |
| Reduced parking spaces for high emission vehicles | Parking for conventional vehicles reduced |
| Workplace parking levy | Local authorities can charge businesses for every employee who parks in the area |
| Dedicated parking for LEV car club vehicles | Allocating parking for sole use by LEV car clubs (see chapter 9 for details) |

8.3 IMPLEMENTATION Local authorities are responsible for different elements of parking policy including restrictions, tariff rates, penalties, public communication and signage, so there is much autonomy in the approach that can be taken to incentivise the uptake of LEVs by the council.

As with road charging and access measures, TOs are the main mechanism for implementing any new parking measures, on road or in car parks. TOs are designed to regulate, restrict or prohibit the use of a road or any part of the width of a road by vehicular traffic or pedestrians.

TOs can apply at all times or during specific periods, and certain classes of traffic may be exempted. Public notification is given of a TO before it is discussed in an internal local authority committee. Proposals must be signed off by senior management and elected members before being implemented.

If parking measures are related to a planning application, then the process would involve the use of **planning gain** (such as Section 106 agreements – for more details, see chapters 3 and 5).

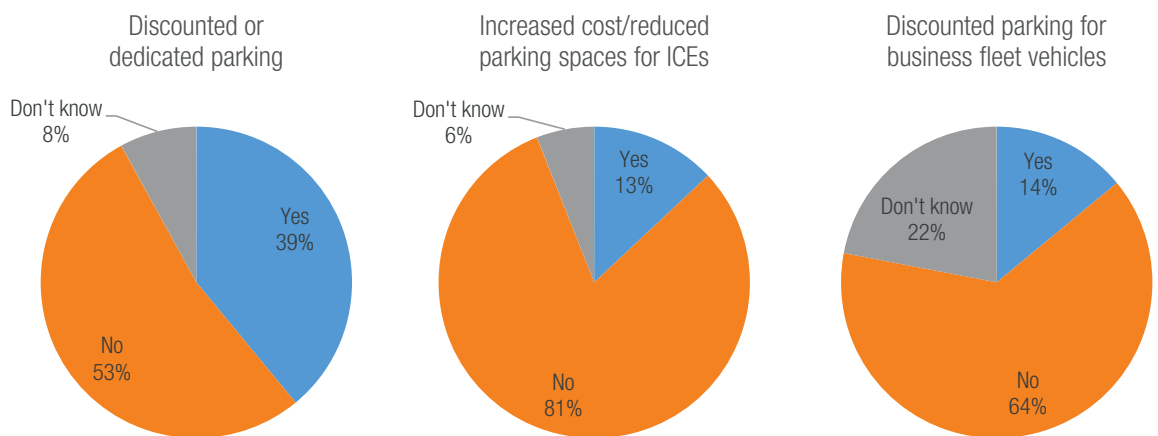
Local authorities are provided with guidance on parking and traffic management duties from the Department for Transport under the Road Traffic Regulation Act 1984. Under the Transport Act 2000 local traffic authorities in England and Wales, outside London, may introduce a **workplace parking levy** to help tackle congestion in towns and cities. The levy is collected by way of a licensing scheme, whereby an owner of premises applies to their local authority for a licence to park up to a maximum number of vehicles, and pays the appropriate sum based on the charge per unit. Local authorities are obliged to issue the licence for the number of units requested: they may not use this

mechanism as a means of directly controlling the number of parking places provided.

A key issue related to parking measures is **enforcement**. To make provision for LEVs at scale would require an extension of time- or space-based fines that currently exist to ensure that only eligible vehicles were benefitting from the favourable conditions set for LEVs.

As can be seen in Figure 10, some 40% of the local authorities surveyed implement some form of discounted parking for LEVs. Reducing the available space for conventional cars is a less common measure in these local authorities, though it is being implemented in 13% of them.

Figure 10 – Percentage of local authorities in the survey that had implemented different parking measures to promote LEVs



8.4 CASE STUDIES

Dedicated LEV Spaces

In **Oslo**, a number of the council-owned car parks in the city centre have been allocated exclusively for use by electric vehicles. This has not only promoted the switch to LEVs, but has also reduced the number of parking spaces for higher emission vehicles in the city. More in-depth details on the package of measures to support electric vehicle uptake are provided in chapter 7.

Bury St Edmunds has also reserved a car park exclusively for use by LEVs.

Free Parking

In **Westminster**, as in a number of the other London Boroughs, the City Council allows electric-powered and plug-in hybrids to park in metered, pay-and-display and pay-by-phone bays, as well as recharging bays

for free throughout the Borough. Drivers registered to Westminster City Council Car Park Electric Vehicle Card receive a further discount to park in a car park of their choice.

Barcelona's smart card allows electric car owners across the city to park and charge their vehicles for free. Putting a time limit on the offer helps to keep the spaces turning over. As more electric vehicles enter the fleet, the council recognises that it may be necessary to limit the use of charging bays to vehicles that are recharging. It is likely that over time, low emission spaces (without charging) facilities will need to be offered in addition to charging spots.

Permits

In the London Borough of **Islington** and in **Newcastle**, free resident parking permits are offered to electric vehicle owners.

In Islington, residents can also buy an electric vehicle charging point permit to use a dedicated on-street charging point.

Permits in **Brighton** and **Hove** are free for electric vehicle owners or business users. Here the permit gives permission to park at a charging point whilst charging. Resident parking permits are also 50% cheaper for other LEVs.

Driven by poor air quality, and the direct responsibility for public health afforded to them by the Health and Social Care Act 2012, **Hackney Borough Council** recently reviewed its parking permit approach and decided to switch from an engine size-based charging to a CO₂ emissions-based charging system. From July 2015, motorists who receive an increase in permit charges can renew for one year at the existing price, and from July 2016 motorists can renew for one year at 50% discount of the difference between the old and the new price. Full charges will be implemented from 2017 and the council is currently investigating whether support will be offered to help residents scrap their older, polluting vehicles.

Amsterdam is reducing the waiting time for parking permit applications from electric vehicle drivers. There is currently a 5-year waiting list for a resident's parking permit, but electric car owners are given priority on the list and can park for a reduced fee once successful. An alternative approach has been taken in **York**, where higher CO₂ emitting vehicles (in tax bands J, K, L, and M) are subject to higher resident permit charges and vehicles that emit up to 120g CO₂/km or are electric or LPG powered are entitled to a 50% discount off the price of a permit. And in **Edinburgh**, parking permits are issued on a banded scheme proportional to vehicle CO₂ emissions.

The Love Lane development in Woolwich Town Centre in the Royal Borough of **Greenwich** introduced emission-based charging according to vehicle tax banding for 500 residential parking spaces in 2007. Charges ranged from £0-£300. This was a part of a package of measures that were introduced through a single site planning agreement. More details and examples on the role of planning in facilitating such incentives can be found in chapter 3.

Between 2007 and 2014, **Stockport** Council offered free parking in all its car parks and on-street to all electric vehicles, hybrids and very low emission cars using the tax disc to identify these Band 'A' vehicles. Now that tax discs have been abolished, the scheme continues with a nominal annual fee of £10 for a permit.

As part of the council's comprehensive Green Ambition Plan for **Kirklees** to be a place for green living, the Green One is an annual parking season ticket covering car parks in 7 areas within the council's administrative boundary, which is available to electric vehicles and all cars that emit less than 100gCO₂/km. Drivers with fully electric cars are entitled 100% discount on the cost of parking. Other vehicles are eligible for 50% reduction in parking costs, so long as they are within the 100gCO₂/km threshold and are not solely fuelled with petrol or diesel. The permit covers both on and off-street parking and is flexible in terms of the number of days of the week and car parks that are covered. Where costs do apply, the payment can be made annually or monthly.



Image credit: Sheffield City Council

FOCUS ON – SHEFFIELD: GREEN PARKING PERMIT

Specifically as a part of the city's effort to encourage LEVs, in Sheffield, electric, LPG and hybrid vehicles are eligible for the city's green permit, which covers city centre parking – both on-street parking bays and car parks. The joining fee is £10 and the annual fee is £100 – all permits are 12 months in duration. Time limits for parking are varied; some on-street parking has no time limit, whilst others have a 2-hour limit.

Car parks generally have no time limits, but some are set at 6 hours. Once registered, holders are issued with a permit showing the vehicle registration number and a cardboard clock. When parking, both the permit and the clock (set to the arrival time) need to be clearly displayed in the vehicle windscreen in order to avoid a parking fine. Since 2009 the city council has also operated residents and business parking permits which benefit from a 50% fee reduction if vehicles using the permit are in tax bands A and B.

Workplace Parking Levy

Nottingham was the first local authority in the UK to implement a workplace parking levy. The scheme came into force in 2012 and is focused on reducing congestion, with revenues raised used to fund alternatives to private car use. This is being used to fund public transport and the city's car club scheme. The levy does offer exemptions and discounts for certain types of vehicles, but this is not currently based on emissions profile.

8.5 CHALLENGES

Whilst leveraging parking policy can be effective, there is a trade-off for local authorities between encouraging LEVs and obtaining parking revenue as a secure income in times of austerity. The degree of reliance on revenues generated from parking will be different between local authorities. In 2010/11, local authorities' receipts from parking totalled £1.27 billion, while the net income from both on and off-street parking service revenues for that year was £511.6 million, rising to £565.4 million in 2011/12.⁶ Introducing discounted parking for LEVs will have an impact on this revenue and councils may therefore need to manage any loss of surplus funds and such measures would require support from elected members and senior finance officers.

Additional challenges which need to be considered:

- » Changes to parking regulations can be time consuming to implement, especially where new measures are being tested.
- » There is a lack of clear guidelines, policy and legislation on enforcement, especially in terms of non-LEV use of LEV-only spaces.
- » Availability of parking spaces can be highly limited in urban local authorities, making it difficult to justify allocating dedicated bays for LEVs.
- » Difficulty transitioning from free parking in some locations to paid parking at others due to psychological barriers and lack of precedent.
- » The future tipping point, where LEVs become the norm, could cause problems for discounted permits. Oslo set a clear time frame for its measures, and this approach could help overcome such an issue.
- » Local authorities may have limited influence over car parks that are privately owned or managed.

8.6 OUTLOOK

The research in this study found that 40% of the local authorities surveyed had implemented parking measures to promote LEV uptake. And as demonstrated by the experiences outside the UK highlighted in the case studies in this chapter, parking has been an important policy area in terms of incentivising the shift to a lower emission fleet. It can therefore be reasonably expected that parking incentives for LEVs will become increasingly commonplace across the UK.

This will be supported by local authorities having considerable autonomy over parking. Moreover, as these measures can provide highly valued benefits to individuals and organisations, they offer significant potential to boost sales of LEVs to both private buyers and business fleets.

Implementation of these measures will also be supported by decoupling the provision of LEV parking from the installation of recharging/refuelling infrastructure. Providing conveniently located dedicated parking for LEVs will itself become increasingly recognised as a significant benefit. This is especially the case with electric vehicles, where the majority of urban journeys will continue to be short enough not to require top up public charging. Furthermore, decoupling infrastructure from parking incentives also removes the need to install charge points, making the measure more cost effective and easier for local authorities to implement.

Many local authorities will need to address the concern over any potential reduction in parking revenues. This may require

⁶ <https://www.gov.uk/government/news/town-hall-transparency-to-expose-car-parking-charges>

that measures are restricted to prescribed timelines, or that reduced parking revenues are balanced against the potential air quality fines or associated public health costs in a local area. It may also result in variable tariffs, which make discounts for LEVs cost neutral by charging more for the most polluting vehicles.

Parking enforcement and clear signage are fundamental to ensuring that benefits are available, communicated clearly and easily understood by LEV drivers. This will also help ensure that measures are manageable in the long-term.

The overarching objective for many local authorities will be to ensure that parking policy is consistent with, and contributes to, overall transport policy and efforts to incentivise LEVs through parking are also integrated into local transport and development plans. This will enable measures to promote intelligent use of LEVs to become a part of a wider sustainable transport system.

FURTHER INFORMATION

British Parking Association

<http://www.britishparking.co.uk/>

UK Parliamentary Briefing Paper—Roads: Traffic Regulation Orders

<http://www.parliament.uk/briefing-papers/SN06013.pdf>

RAC Foundation – The Control of Parking by Local Authorities

http://www.racfoundation.org/assets/rac_foundation/content/downloadables/elliott%20-%20parking%20enforcement%20-%20main%20report%20-%2016082010.pdf



Image credit: Autolib'

9 Car Clubs

9.1 INTRODUCTION

Recent years has seen a significant increase in car club membership across the UK. Facilitating the sign-up of businesses and individuals to car clubs can help reduce the numbers of vehicles travelling into a town or city, which in turn supports objectives on air quality and congestion.

There has also been an increase in recent years in the roll-out of electric and hybrid electric vehicles. This includes the growth of City Car Club's fleet of petrol-electric hybrids, the launch of E-Car Club which only operates electric vehicles and Co-wheels making further investment in electric vehicles and trialling the UK's first shared hydrogen fuelled car club vehicle.

Local authorities often play an important role in the establishment of car clubs and

to encourage existing car club operators to invest in LEVs. This can help to increase the number of LEVs on the road, while reducing the total number of vehicles in a city or community. It can also provide an opportunity for members of the public to drive LEVs, building confidence in new technologies and encouraging greater uptake.

Measures in this area can be implemented at council level, with the lead role being taken by the Transport department, working with Parking Services, Planning as well as the Highways Authority, taking into account the regional context. As local authorities may want to sign up to using a car club, procurement teams would also need to get involved (see chapter 4 for more on procurement).

9.2 OVERVIEW

Car club-related measures available to local government are outlined in Table 9.

Table 9 – Overview of car club measures to promote LEVs

| MEASURE | DETAILS |
|---|--|
| Dedicated parking bays for low emission car club vehicles | Parking spaces for back-to-base car club operators designated for exclusive use for LEVs |
| LEV-based car clubs | Encouraging the development of car clubs where the fleet is made up largely/entirely of LEVs |

9.3 IMPLEMENTATION

Facilitating the establishment of LEV-based car clubs should not require any changes to policy, as Air Quality Action Plans and Local Transport Plans would contain the necessary provisions. However, where any legislative changes might be required, the Traffic Management Act, Traffic Orders and Local Implementation Plans/Local Development Plans may be of wider relevance.

Local authorities may also take into account ISO14000 standards as a benchmark to procure goods, the European Directive on Public Sector Vehicles Emissions Standards/Clean Vehicles Directive and EU legislation on open procurement, when setting up initiatives to encourage car clubs to use LEVs.

Where related to development, planning gain and highways legislation would be applicable – car clubs could work with developers to write access provision for the schemes into planning gain requirements.

Where charging infrastructure is not to be provided by the local authority, the implementation of car club-related measures should not require new legislation as the relevant licenses and agreements are contained within the Highways Act.

The expansion of car clubs in Scotland has been supported by the Developing Car Clubs in Scotland (DCCS) programme, which is funded by Transport Scotland (the national transport agency for Scotland). The DCCS programme is managed by Carplus and has funded the provision of financial and technical support to enable the growth of car clubs in urban and rural locations across Scotland. It has also provided funding to facilitate the introduction of an additional 58 new electric car club vehicles. This meant that at the start of 2015 there were 73 all electric car club vehicles in Scotland, which was more than the rest of the UK combined.

9.4 CASE STUDIES

The case studies outlined in this section, show that where LEV-based car clubs are promoted, parking bays are often part of the package of measures a local authority supports. A further common theme is that public-private partnerships often play a major role in facilitating the development of car clubs.

The London Borough of **Camden** is placing a significant emphasis in switching conventional parking spaces to car club spaces

and will give preference to LEV-based car clubs. Through planning policy, the council is setting requirements for electric vehicle car clubs. Camden has also reduced its staff pool cars and is using a local car club.

In 2014, **Dundee** Council's development committee approved £150,000 of public money to support the Co-wheels Car Club in purchasing two electric vehicles, with further funding provided by Transport

Scotland's Developing Car Clubs programme to purchase a further six electric cars and one electric van. The council is also providing parking infrastructure in 2015 that will serve the dual purpose of being both a publicly accessible electric vehicle charging spot as well as a car club parking bay.

Co-wheels also offer fleet and pool car management solutions for NHS Trusts in the UK. **Derbyshire** Community Health Services NHS Trust, for example, has 10 Co-wheels pool cars in its fleet including one electric vehicle. All models have been chosen specifically because of their low CO₂ emissions and can be booked online. As the NHS is often one of the biggest employers in many local authority areas, understanding where the potential exists for collaboration to help meet council objectives is important for local authorities in the promotion of LEVs.

Between 2012 and 2013 Transport Scotland gave the **Edinburgh** Partnership (led by the City of Edinburgh Council) £260,000 to install publicly accessible electric vehicle charging points. The delivery partner agencies for the project included Edinburgh University, Queen Margaret University and NHS Lothian. As a part of the project, the Edinburgh Centre for Carbon Innovation launched an electric car-sharing scheme with City Car Club, with vehicles located at Edinburgh University. This is part of a wider strategy of engaging with local actors through Community Planning Partnerships – an approach that has proven successful in administering grants, sharing knowledge and mobilising relevant actors.

Aberdeen is one of the UK's fastest growing car clubs and has been at the forefront in promoting ULEVs. In early 2015, there were 16 electric car club vehicles in Aberdeen, more than any other city in the UK, including London. Aberdeen was also the first car club in the world to trial hydrogen vehicles, allowing ordinary members to experience this new technology. The city has also developed an innovative partnership with Co-wheels whereby the car club operator manages some of the councils own pool cars and makes these available to the public outside of working hours.

Travelwise **Merseyside** has developed a Car Share Marketing Guide, more information on measures like this can be found in chapter 6.

In 2015, **London**'s Car Club Coalition, a partnership between stakeholders including car club operators, the London Councils, the GLA and TfL established a Car Club Strategy for London, which outlines a 10-point action plan to help grow the car club market in London. Action 7 in the strategy is driving the uptake of LEVs through car clubs.



Image credit: Copyleft

FOCUS ON – AUTOLIB', PARIS: ELECTRIC CAR CLUB

Autolib' is an all-electric car-sharing service, based in Paris and launched in 2011. The service has been extremely successful since its inception: it now has more than 3,300 cars, 5,200 charging stations, 220,000 subscribers and 100,000 usages per week. Autolib' was established through a PPP that was commissioned by then-Mayor Bertrand Delanoë in 2009. Its success demonstrates how effective such cross-cutting initiatives can be.

IER/Bolloré developed the vehicles and the system together and now run the scheme. The Île de France regional government, the city government and the surrounding 75 municipalities have all been actively involved in establishing the scheme.

The reason Autolib' differs from other car sharing schemes like Car2Go or Zipcar lies in the business model that was established between the public and private partners. Paris invested €35 million and designated a number of parking spaces for Autolib'. In this parking space leasing agreement, Bolloré in return provides the vehicles and pays back the city's investment with the revenues generated by member subscription.

9.5 CHALLENGES

A particular challenge for electric car club vehicles is **recharging**. Who pays for the electricity and how charging time can be accommodated for in a real-time booking car club scheme are issues that will need to be clarified in order for LEV car clubs to become viable at scale.

A **financial barrier** is that LEVs can be more expensive than small low cost fossil fuel vehicles, which are typically used in car clubs. Similarly, the **utilisation** of pure electric car club vehicles can be lower because of the need to allow for recharging between uses, which reduces the revenues that can be realised

by operators. This, however, can sometimes be balanced out by the lower maintenance and fuel costs offered by electric vehicles.

There are also **operational barriers** to introducing new low emission technologies to car clubs. This includes the need to give members the necessary information to enable them to confidently use new vehicles (such as how to plug-in an electric vehicle or drive an automatic car).

A lack of **available kerb space** or removal of existing waiting and loading provision can be a challenge in implementing car club

parking bays in certain local authorities. Indeed, with specific regard to London, the public transport acceptability level (PTAL)⁷ must be taken into account. In the research for this study it was suggested that new developments including car use in London is capped at PTAL level 3 downwards and areas set at PTAL level 3 and lower can push for car clubs, but spaces will come at the expense of currently available parking. Examples like those evidenced in Camden demonstrate that overcoming such challenges is possible.

An internal challenge for local authorities is that **fleet managers** may perceive their role can be made obsolete by using car clubs instead of pool cars. The reality is however, that fleet managers will be required to manage the integration of shared cars into the mix offered. Car clubs offer an opportunity for fleet managers to optimise their operations – saving money and making more demand responsive decisions that can give greater flexibility to the entire fleet.

9.6 OUTLOOK

Car clubs can play an important role in mainstreaming LEVs by introducing them to a wide range of new users. Similarly the provision of innovative ULEVs also provides an opportunity to attract new members to car clubs. Whilst financial and operational barriers to widespread adoption of electric and plug-in hybrid vehicles as part of the car club fleet do still exist, there is growing market interest making it more feasible to expand provision.

Local authorities can play an important role in ensuring that there is the necessary infrastructure in place to support these schemes and to encourage the provision of LEVs.

Similarly, by subscribing to car clubs as customers, local authorities can help to create a critical mass of demand to establish these services in cities and promote new ownership models, whilst also accessing the benefit of more flexible fleet solutions than offered by wholly-owned pool cars. This can help to cut costs and meet changing needs, especially where LEVs are integral to this offer.

Promoting LEV-based car clubs can be part of wider strategies and can also bring economic and tourism-related benefits, more information on measures relating to these areas can be found in chapter 14.

FURTHER INFORMATION

Car Plus, Car Clubs Starter Pack for Local Authorities

<http://www.carplus.org.uk/wp-content/uploads/2012/04/2-Car-Clubs-Starter-Pack-for-Local-Authorities.pdf>

Car Plus, A cost-effective route to a Low Carbon Britain

http://www.carplus.org.uk/wp-content/uploads/2012/08/Car-Clubs-a-Cost-Effective-Route-to-a-Low-Carbon-Britain_Carplus-Vision-Document_2010.pdf

Car Plus, Annual Survey of Car Clubs 2013/4: Summary Report

http://www.carplus.org.uk/wp-content/uploads/2014/04/England-and-Wales_Final-with-cover_2.pdf

⁷The public transport accessibility level (PTAL) is a method sometimes used in United Kingdom transport planning to assess the access level (distance from any point to the nearest public transport stop and frequency of service from this stop) of geographical areas to public transport.



Image credit: Urban Foresight

10 Taxis and Private Hire Vehicles

10.1 INTRODUCTION

The taxi fleet in any given local area contributes significantly to the total vehicle miles travelled, with many short journeys concentrated in a small area. They are therefore a key source of air pollutants in many towns and cities. As such, incentivising the owners of taxis and private hire vehicles to switch to LEVs offers significant environmental benefits. The high mileage driven by these vehicles means that drivers can also enjoy considerable financial savings from switching to less expensive cleaner fuels. Furthermore, taxis can also have a key role to play in increasing public exposure to LEVs and in doing so raise awareness

and improve perceptions of and confidence in the operation of these vehicles.

Measures regarding taxis and private hire vehicles can be implemented at council level, primarily via the licensing department but with Environmental Health where such measures are applicable, and by working with relevant external stakeholders including taxi/private hire operators, unions and taxi associations where applicable.

10.2 OVERVIEW Either by offering reduced licence fees for low emission taxis, relaxing licence caps for firms that employ less impactful vehicles, or offering rebates to firms or drivers to reduce the initial outlay costs for upgrading to a LEV, there are multiple ways through which a local authority can facilitate the switch to a cleaner taxi fleet. Table 10 outlines the measures that are considered in this chapter.

Table 10 – Taxi and private hire vehicle measures to promote LEVs

| MEASURE | DETAILS |
|---|---|
| Reduced fees for taxi and private hire licenses | Taxi and private hire firms pay less for licensing LEVs |
| Flexible licensing caps | The cap on Hackney carriage licenses in a given area or awarded to a particular company could be altered for LEVs |
| Taxi emission standards | A requirement for a particular amount of LEVs in any given fleet to meet a particular emission standard |
| Dedicated LEV taxi ranks | Taxi ranks set aside for exclusive use by LEVs |
| Rebates and other financial incentives | Financial incentives to encourage purchase of LEV taxis |

10.3 IMPLEMENTATION Policy implementation in this area is relatively straightforward. **Taxi licensing regulations** are the primary means of implementation, and local authority licensing departments can set emissions thresholds, licenses and types of vehicles to be used.

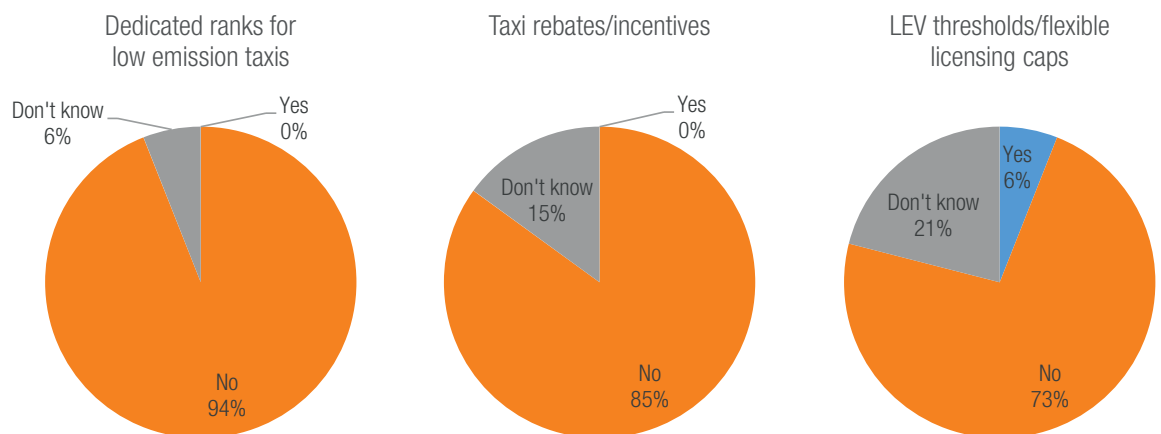
Councils can differentiate the **licensing fees** charged to drivers or firms and offer a lower rate for LEVs. Although rebates offer a starting point to encourage lower emission vehicles into the fleet, it is not a guaranteed measure as it relies on the willingness of owners to buy a new vehicle. Promoting awareness of the availability of the grant and the benefits to the drivers in opting for a LEV over a conventional vehicle will also be required.

Similarly, councils can remove or alter the **cap placed on the number of licenses** available in the local area. This would give drivers and operators of LEVs priority in accessing new licenses. However, any such changes would need to be proportionate and give due consideration to local demand and potential impacts on the revenue of drivers.

In London the Mayor sets policy and TfL regulates the taxi and private hire industry and is responsible for the implementation of any changes to licensing or related measures.

As shown in Figure 11, the research undertaken to prepare this guide found that a relatively small number of local authorities have adopted measures in this area. Flexible licensing caps or minimum thresholds for LEVs in taxi fleets are the only measure to be adopted (6% of local authorities in the survey).

Figure 11 – Percentage of local authorities in the survey that had implemented different taxi-related measures to promote LEVs



10.4 CASE STUDIES

Reduced Licence Fees

Since 2011, taxis and private hire vehicle owners in **Wigan** are entitled to a licence fee reduction of £20 per year for LPG vehicles, or those with tailpipe emissions of less than 150gCO₂/km. For ultra low emission electric plug-in vehicles, the annual fee is halved.

Although there are a fixed maximum number of 1,300 licences in the **Brussels-Capital** region, as only 1,227 were granted in 2013, Brussels granted 50 taxi licences specifically for electric vehicles, which were divided up between the city's 19 operators. The operators were given 6 months to bring the taxis into circulation and the concession will be available for 7 years.

Taxi Emission Standards

In **London**, the Mayor's Air Quality Strategy (2010) introduced a new 15-year age limit for taxis and a requirement for all new taxis entering the fleet to meet a minimum Euro 5 standard from 1 April 2012. In 2014, TfL consulted on the proposed Ultra Low Emission Zone for central London, which proposes to introduce stricter requirements for taxi and private hire vehicles. It proposes that taxi and private hire vehicles presented for licence from 2018 must be zero emission capable (a minimum electric range of 30 miles and emissions of less than 50g/km CO₂). The Ultra Low Emission Zone also includes a proposal to reduce the age limit for taxis from 15 to 10 years.



Image credit: City of York Council

FOCUS ON – YORK: LEV TAXIS

Activities to promote low emission taxis in York are integrated – licensing, financial and access incentives are on offer to encourage owners to opt for cleaner vehicles.

York's Low Emission Strategy highlighted in 2012 that the city would use licensing controls to improve the emissions profile of its local taxis and private hire vehicles. Subsequently, since 2013, taxi owners in York have had access to half price taxi licensing, and the City of York Council is also offering drivers a percentage discount worth up to £3,000 towards the cost of a new or used LEV. Petrol hybrid or full electric vehicles that either emit less than 100gCO₂/km or meet Euro 5 standards are eligible. Drivers must be registered to work in York to obtain the discount.

The efforts undertaken by the Council to date have largely been driven by the need to reduce air pollution. The measures have enabled over 45 low emission taxis to be incorporated into the fleet in York, including Hackney and Private Hires and has been seeding knowledge and confidence in the taxi trade of new vehicle technology. The city's Streamline Taxis who own the first electric taxi in the city has also made a commitment to becoming York's first fully 'low emission taxi' company.

Rebates and Subsidies

In 2011 and 2012 subsidies were given to **Madrid**'s taxi drivers to enable them to replace their vehicles with taxis that emitted 160gCO₂/km or less.

Dedicated Taxi Ranks

As part of its Electric Vehicle Strategy 2014-2024, the **Liverpool** City Region has stated that it will develop electric taxi ranks and facilitate the provision and installation of a supporting rapid charging infrastructure.

Private Hire

Phoenix Taxis, a private hire firm operating in **South Northumberland** and **Newcastle**, was one of the UK's first taxi firms to operate electric vehicles as an integral part of its fleet. In 1997, the company introduced LPG vehicles, and hybrids were introduced to the range in 1999. At the end of 2014 the company had 20 electric vehicles in its fleet. Between 2010 and 2013, the company managed to reduce its carbon footprint by one third and achieve a doubling of turnover. The company has collaborated with local organisations to manage the recharging of its fleet – offering preferential fares to staff and students at Newcastle University and at the same time gaining access to the university's rapid charger.

LPG Conversions

In 2014, **Birmingham** City Council secured £500,000 from the Government's Clean Vehicle Technology fund to work with taxi operators to convert up to 80 Hackney Carriage Cabs to run on LPG. The scheme will be marketed through the council's existing licensing networks with the taxi community, with the intention of reducing nitrogen dioxide emissions in certain hotspots across the city.

10.5 CHALLENGES

One crucial factor in the implementation of such measures is the buy-in from taxi drivers themselves. They may consider risks of not meeting range, or losing revenue when the vehicle is charging, as threats to the viability of the business when there are a lot of unknowns to factor in to making the decision to switch to a LEV. This is largely a community of self-employed business people and the choice of vehicle and associated running costs can significantly affect their take home pay. However, this also creates the opportunity whereby being able to demonstrate savings or providing other benefits will undoubtedly encourage uptake of LEVs. Local authorities have a role to play in supporting these decisions.

Other challenges for local authorities include:

- » LEV taxis need to be designed with accessibility requirements in mind to meet local authority licensing conditions, but at the current time, vehicle design and battery technology may pose space constraints that render them incompatible.

- » Discounted low emission taxi licences can deprive councils of revenue from the costs of licensing.
- » The land ownership of certain sites where taxi ranks are currently situated would require buy-in from other stakeholders, such as Network Rail for example, in order to establish low emission taxi ranks.
- » Similarly, not all local authorities have jurisdiction over taxi ranks. Whilst some ranks are managed through traffic regulation orders, this differs between local authorities. In some local authorities the Police are responsible for taxi rank enforcement.

10.6 OUTLOOK

While taxis and private vehicles may only constitute a small percentage of a vehicle fleet in a local area, the high mileage driven by these vehicles makes them a disproportionately large source of emissions within towns and cities across the UK.

This high mileage also means that LEVs offering lower running costs can offer attractive financial benefits to taxi drivers and operators. Moreover, as many taxi and private hire vehicles make short, regular trips they can be well suited to use of LEVs in particular electric and plug-in hybrid technologies.

High mileage also increases the need for suitable infrastructure. For electric vehicles this is likely to mean rapid chargers installed at taxi offices and across cities; and potentially wireless charging at taxi ranks.

CNG, LPG and in the future hydrogen fuel cells will also offer opportunities to achieve higher mileage and much reduced emissions. This will require the establishment complementary refuelling infrastructure.

Whilst there has been limited action taken to date by the UK local authorities surveyed to promote LEV taxis and private hire vehicles, places such as York that have implemented these measures have had clear successes and suggest that such schemes offer significant potential to support uptake across the UK.

Whilst there are some challenges that relate to the complexities of governing taxi licenses and ranks in the UK, with cooperation and collaboration between the involved stakeholders these can be overcome and mutually beneficial to all involved.

With the implementation of these measures across the UK's local authorities, low emission taxi and private hire vehicles stand to boost overall LEV uptake and to expose the passengers that they carry to the performance and benefits of these vehicles.

FURTHER INFORMATION

Department for Transport, Taxi and private hire vehicle licensing: best practice guidance
<https://www.gov.uk/government/publications/taxi-and-private-hire-vehicle-licensing-best-practice-guidance>

Office for Low Emission Vehicles, Ultra low emission vehicle taxi scheme: preliminary guidance
<https://www.gov.uk/government/publications/ultra-low-emission-vehicle-taxi-scheme-preliminary-guidance>

The RSA, Cabbies, Costs and Climate Change
<https://www.thersa.org/globalassets/pdfs/blogs/cabbies-costs-and-climate-change.pdf>



Image credit: Chrischerf

11 Integration with the Wider Transport Network

11.1 INTRODUCTION

Local authorities can promote LEVs as part of a more integrated transport network to help realise broader sustainable transport strategy goals. By enabling access to parking and infrastructure for LEVs alongside public transport, bike and car sharing schemes, drivers are given options to make journeys in their own vehicles part of an integrated mobility network. This can make it more convenient and practical for many people to use public transport, as well as providing a targeted way to reduce emissions and traffic in urban areas.

Because the measures in this category are quite wide-ranging, a host of departments within a council may be involved in their implementation, including Parking Services, Transport and Planning as well as external agencies including the Highways Authority, transport operators, Integrated Transport Authorities and Passenger Transport Executives. In London all public transport is managed by TfL, but links between the Borough Councils' transport departments and TfL will be relevant.

11.2 OVERVIEW A range measures to integrate LEVs into the wider transport available to local government is outlined in Table 11.

Table 11 – Measures to promote LEV integration with the wider transport network

| MEASURE | DETAILS |
|---|--|
| Discounted and integrated travel | One integrated payment card for parking, park and ride, vehicle refuelling/charging, car sharing, bike hire and public transport |
| Discounted parking fee at park and ride sites | LEVs permitted to park at park and ride sites for free or at a reduced cost |
| Discounted recharging/refuelling at park and ride sites | LEVs permitted to recharge/refuel at park and ride sites for free or at a reduced cost |
| Discounted car ferry tariff | LEVs permitted to travel for free/at reduced cost on car ferries |
| Freight consolidation centres | The use of LEV vans are facilitated for the movement of urban freight and logistics |
| Travel plans | Supporting businesses in developing and implementing travel plans that make provision for LEVs |

11.3 IMPLEMENTATION Because of the wide-ranging implications of measures in this area, there are a number of related strategies and implementation mechanisms – such as Local Transport Plans, Local Implementation Plans and City Deal Bids. Such schemes generally fit with overall transport strategy and policy set at a council level.

Passenger Transport Executives can provide funding for subsidised or free park and ride facilities for LEVs.

Under current circumstances, the ability to demonstrate that economic development benefits will be delivered by any given initiative is key to the successful delivery of any such measures.

Certain local areas will have authority over local car ferry services, offering the potential to differentiate the cost of use between conventionally-fuelled and LEVs to encourage uptake.

11.4 CASE STUDIES Links to Public Transport

‘Mi Nuovo Elettrico’ is a programme launched in 2010 by **Emilia-Romagna** in Italy. The regional mobility chip card allows electric vehicle drivers to charge their vehicles, access public transport, as well as bike and car sharing.

‘eTicket RheinMain’ operates as the key for rental of electric cars, bicycles, ebikes and car club vehicles and all bus and train travel in the **Frankfurt** area of Germany. More details on the role of car clubs as a means to encourage the uptake of LEVs are offered in chapter 9.

The ‘Ha:mo’ project in **Toyota City**, Japan, is a multi-modal navigation system with the capability to incorporate multiple forms of transport into one route, including: cars, trains, buses, taxis, power-assisted bicycles and a network of over 100 shared ultra compact electric vehicles. The Ha:mo smartphone app gives real time information on the availability of parking spaces, traffic forecasts and provides reservations for a car sharing network aimed to enable the planning of fully integrated door-to-door journeys.



Image credit: Bernd Schwabe

FOCUS ON – HANNOVER: INTEGRATED TRANSPORT SERVICES

Since 2004, HANNOVERmobil has been a service offered by the regional transport association (GVH) and üstra (Hannover’s public transport operator) to integrate car clubs, public transport and taxi options.

In 2007, the car club part of the scheme began running on hybrid vehicles.

As a ‘comprehensive mobility provider’ GVH offered passengers different options to ensure seamless mobility depending on the needs of the traveller.

In 2014, the üstra/GVH card was connected to VW’s own mobility card to further extend the services offered. Linking the VW mobility card with HANNOVERmobil’s existing offer has enabled parking and charging for electric vehicles to be added to the list of services offered in the region into a single platform.

Discounted Park and Ride

There are a number of park and ride sites in the UK offering free or discounted recharging for electric vehicles. **Taunton** installed charging points at Henlade park and ride in 2011 and users can charge their vehicles for free. **Coventry** Memorial Park also offers free electricity and free parking for electric vehicle owners, with standard bus fares into the city charged.

Discounted Car Ferries

Norway's car ferries offer free passage to electric vehicles and since 2013 car passengers on **Bute and Mull** ferries are offered a 50% fare discount for electric vehicles.

A very successful example of this is the Broadmead Freight Consolidation Scheme in **Bristol**. Despite being set up initially for a trial period of eight months in May 2004, the scheme is still running and has helped to reduce congestion and associated emissions in one of the UK's busiest cities. Not only is the scheme still going, it has been extended to take in **Bath**, and DHL Supply Chain now delivers to 115 businesses. The consolidation centre works by acting as a central delivery hub on the periphery of the city where deliveries are streamlined and the number of delivery vehicles travelling into Broadmead is reduced, whilst at the same time it provides an improved delivery service to retailers. Two electric vehicles are in operation as dedicated delivery vehicles and Euro 5-compliant vehicles are available for back-up when required.

Freight Consolidation

A further mechanism through which LEVs can be integrated with the wider transport network is the introduction of freight consolidation centres (also known as City Logistic Consolidation Centres) that use low emission light goods vehicles to distribute goods around city areas.

11.5 CHALLENGES

The types of measures outlined here require more **long-term planning** to implement successfully, due to the changes required to the current system and also because multiple diverse stakeholders are likely to be involved in development and implementation.

Wider challenges related to **encouraging people to use public transport or active travel** also come into play.

Similarly, **siloed operation** and ownership of different transport networks can mean that multiple stakeholders need to be engaged and that the commercial and technical integration of inter-modal journeys can be a challenge.

11.6 OUTLOOK

Efficient and sustainable transport systems are essential to local economies, communities, environments, public health and wellbeing. Measures to promote LEVs need to advance improvements in the overall quality and sustainability of local transport rather than adding to existing problems. LEVs need to be embedded as an integral part of the wider transport system.

To ensure that measures to promote LEV uptake do not contradict initiatives to discourage car use, an important objective for local authorities is to integrate LEVs with wider public transport networks. The provision of measures such as preferred parking or infrastructure at transport interchanges can incentivise LEV uptake while also encouraging people to use public transport who would otherwise find it difficult or inconvenient.

As public transport becomes more networked with integrated ticketing, payment and management systems being rolled out in more regions and urban areas, there is an opportunity to integrate LEVs into this broader offering as part of a more holistic mobility system. There are multiple established technologies to facilitate this integration, as well as a number of approaches. This makes integration with the wider transport network one of the main areas where fragmented approaches stand to deliver a patchwork of measures across the local authorities in the UK. Therefore working together to

ensure early standardisation at both the local and regional level will be important.

Opportunities to reduce emissions from freight are also an area of considerable potential. Measures to remove large trucks from local areas and replace them with LEVs can improve local air quality and congestion and also support the emerging low emission van market. Note however, that commercial vehicles need to be the right size for their duties and replacing one big truck with several smaller ones can add to rather than improve congestion, CO₂ and air pollution.

Promoting the thoughtful use of LEVs offers the wider benefit of educating individuals and organisations to consider the economic and environmental cost of how they work and travel generally – thinking more of door-to-door trips than of particular modes. This in turn can support an overarching ambition to reduce the total number of vehicle miles travelled on UK roads. Therefore, a further area for alignment is behaviour change ambitions of active and sustainable travel campaigns (see chapter 6).

FURTHER INFORMATION

Office for Low Emission Vehicles, Driving the Future Today: A strategy for ultra low emission vehicles in the UK
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239317/ultra-low-emission-vehicle-strategy.pdf

Transport Scotland, Switched On Scotland: A Roadmap to Widespread Adoption of Plug-in Vehicles
http://www.transportscotland.gov.uk/sites/default/files/documents/rrd_reports/uploaded_reports/j272736/j272736.pdf



Image credit: Urban Foresight

12 Pilots and Trials

12.1 INTRODUCTION There are a number of ways in which local authorities can support pilots and trials of LEVs and infrastructure. This includes: directly testing new products, facilitating collaborative projects, providing a testing ground for new initiatives, or offering more general support to developers of new technologies and business models.

Supporting or engaging in pilots or trials is a way for local authorities to raise the profile of LEVs, as well as understand the long-term implications of new fuels and technologies. Such projects can raise confidence in vehicle and infrastructure performance and help increase understanding of economic, social and environmental costs and impacts. Important lessons can be learned from

participating in demonstration projects that can help move the whole LEV market forward as well as creating the necessary policies and infrastructure to increase the scale of uptake.

Pilot and trial projects can also be useful in changing the perception of parties less receptive to implementing LEV measures, play a role in supporting investment in new technology and create new entrepreneurial opportunities for local businesses.

Local authorities in the UK have the opportunity to undertake their own demonstration trials, as well as participate in national and European pilot programmes.

12.2 OVERVIEW Two key measures relating to pilots and trials available to local government are outlined in Table 12.

Table 12 – Pilot and trial measures to promote LEVs

| MEASURE | DETAILS |
|--|--|
| Local authority trials of new technologies and business models | The local authority itself invests in and trials new technologies and business models |
| Facilitating local demonstration projects and trials | The role of local authorities in supporting the development of pilots and demonstrations |

12.3 IMPLEMENTATION

Identifying potential **funding** is perhaps the most important step in establishing demonstration projects. The funding sources available to a local authority are likely to depend on the nature of the scheme. This includes sustainable transport funds, air quality grants or private sector funding. The government and linked agencies such as Innovate UK have also developed programmes and challenges to encourage the development and uptake of LEVs.

Working in partnership can be an important element of a successful pilot or trial. This includes working with other local authorities and/or other public

and private partners, such as OEMs, technology providers, energy/fuel suppliers, universities and local businesses.

The scope of potential projects means that the level of implementation and parties involved can be diverse and may include local authority transport departments, councillors and fleet managers, as well as external agencies including taxi operators and vehicle manufacturers and fuel suppliers.

Project champions can be particularly important to develop and secure funding, drive an initiative and lead implementation both inside and outside a local authority.

12.4 CASE STUDIES

The **Cross River Partnership** in London was the lead partner of Electric Vehicles in Urban Europe II (EVUE) during 2009 – 2013. The project’s nine city partners focused on developing integrated, sustainable and dynamic leadership techniques for cities to promote the use of electric vehicles. The success of EVUE led to the establishment of FREVUE, which is based on the same core partners and is looking at opportunities for freight electric vehicles.

The London Borough of **Camden** trialled a biomethane waste collection vehicle in partnership with Gasrec, Iveco and CENEX. The demonstration trial was successful

and resulted in Camden purchasing 15 biomethane vans and installing the UK’s first biomethane refuelling station.

The Hydrogen Highway in **California**, first conceived in the 1990 Zero Emission Vehicle Regulation of the state’s Air Resource Board, is a scheme that aims to promote the development of hydrogen fuel cells as a vehicle technology to address the state’s air quality issues and reduce greenhouse gas emissions. The state currently has 13 research and 9 public hydrogen refuelling stations, with 18 more soon to become operational.

The Hydrogen Infrastructure for Transport (HIT) project, is a recent EU TEN-T programme funded initiative which is facilitating the establishment of 3 pilot hydrogen refuelling stations, one in **Rotterdam** and two in Denmark – in **Aalborg** and **Vejle**. HIT will link up to initiatives in the UK and Germany in the

development of an emerging network of infrastructure. The **London** Hydrogen Partnership is also involved in developing hydrogen fuel cell taxis, cars and vans coupled with infrastructure (including renewable hydrogen) demonstration trials, also with the assistance of European funding.



Image credit: Miljöbilar i Stockholm

FOCUS ON – STOCKHOLM: BIOMETHANE FUEL PILOTS

Since 1994, Clean Vehicles in Stockholm has been working to increase the number of electric, ethanol and biomethane vehicles in the city. The scheme first focused on introducing clean vehicles into the city fleet to demonstrate the viability of the vehicles in practice and to provide the necessary infrastructure to support these vehicles.

In 1996 Stockholm introduced 200 dual fuel (petrol/biomethane) cars and opened a pilot anaerobic digester plant to create the biogas, which in turn is converted to biomethane. In 1999 the city brought together 3,000 buyers to introduce ethanol (E85) cars onto the market and in 2002, 5,000 biomethane and hybrid vehicles were purchased through framework agreements.

By testing and trialling new technologies and providing the associated infrastructure along the way, by the time the city began offering incentives to private car owners to switch, the city already had experience with a host of technologies and could provide for these new cars. Public procurement of clean vehicles and clean transportation service (i.e. waste collection, taxi, school transports, internal mail delivery, security services) has been an important tool in the transmission.

Stockholm is now a producer of biogas from waste, which it sells to distributors, and all waste collection trucks that are privately owned are also biomethane fuelled, creating a vibrant local market operating on low emission fuel.

12.5 CHALLENGES

A **lack of resources or expertise** within a local authority can restrict opportunities to participate in pilots and trials.

As in some of the other areas, **funding** can be a challenge and while such projects can be highly beneficial to local authorities, in most instances external funding is required to support such activity.

Failed trials are also seen to carry certain reputational risks and these factors can inhibit authorities in involvement in trials. However, such learning is important to the development of new ideas and should not be seen as a barrier.

12.6 OUTLOOK

The opportunities and challenges that will impact uptake of LEVs can vary considerably between local authorities. Pilots and trials can offer an effective way to develop tailored solutions that harness the expertise and resources of local stakeholders. This can also support job creation by supporting local companies in developing new products and services, as well as helping to facilitate access to new market opportunities.

Local authorities could be encouraged to facilitate LEV trials with local business fleets and taxi companies to raise exposure and confidence in using new technologies and alternative fuels.

Pilots and trials can also provide an effective means to expose the performance and financial benefits of using LEVs, building confidence and encouraging further investments. It is important for local authorities to share information about their demonstration trials and provide insight into the knowledge derived from their experiences.

However, perpetual trials and pilots of LEVs can also create a sense that these technologies are experimental or unproven, which can dent public confidence. Moreover, it should not be necessary for every local authority to undertake formal trials of LEVs, with the sharing of learning from early adopters providing a basis for following authorities to confidently make similar investments.

Similarly, trials of emerging LEV technologies can also raise concerns that currently available technologies may ultimately be superseded and become obsolete. This requires considered messaging and clarity on the purpose of such trials.

FURTHER INFORMATION

Centre for Climate Change Economics and Policy, Funding Low Carbon Cities: Mapping the Risks and Opportunities

<http://www.ccecep.ac.uk/Publications/Working-papers/Papers/110-119/WP113-funding-low-carbon-cities.pdf>

Office for Low Emission Vehicles, Lessons Learnt from the Plugged-in Places Project

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/236750/plugged-in-places-lessons-learnt.pdf



Image credit: kloniwotski

13 Financial Measures

13.1 INTRODUCTION

Local authorities have access to a number of financial measures to encourage adoption of LEVs. This includes: the taxes that they collect and administer from both their residents and

local businesses; the charges that they make for public amenities and services; and the benefits that they offer to their workforce.

13.2 OVERVIEW

The financial measures available to local government considered in this chapter are summarised in Table 13.

Table 13 – Financial measures to promote LEVs

| MEASURE | DETAILS |
|-------------------------------------|---|
| Business rate relief | Businesses are eligible for business rate relief based on contributions to environmental and air quality objectives |
| Finance and grants | Finance and incentives offered by Economic Development Offices to support LEV uptake by businesses |
| Discounts for local public services | Discounts provided to LEV drivers in using public services, public transport, leisure facilities or cultural facilities |
| Salary sacrifice schemes | Employees to give up part of their salary under their terms of employment, in return for their employer providing the employee with a LEV |

13.3 IMPLEMENTATION

Local authorities charge **business rates** on most non-domestic properties, including: shops, offices, factories, warehouses and holiday accommodation. A number of exemptions exist which means that certain types of buildings are not required to pay, such as farm buildings and places of worship. Moreover, local councils also provide some discounts, known as business rate relief. These apply to small businesses, enterprise zones, charities and rural businesses. Theoretically these measures could be extended to recognise commitments to reduce vehicle emissions. This could be based on a scheme similar to business rate relief offered by a number of councils to businesses that achieve living wage accreditation.

Many local authorities offer **finance and grants** towards setting up new premises, staff training, equipment, machinery, and

advertising. This is typically administered through an Economic Development Office and is dependent on the business fulfilling a number of eligibility requirements. This assistance could potentially be used to give businesses the necessary training or financial support to invest in LEVs.

Discounted public services could be an extension or complementary approach to the integration of LEVs into the wider transport network, with a 'local services smart card' extended to give LEV drivers discounts on leisure and community services in the area, such as libraries, leisure centres and cultural venues. As these are usually locally administered services, the links between these services exist and could easily be expanded to include low emission transport considerations, such as electric vehicle charging, car sharing and public transport.

13.4 CASE STUDIES

Caerphilly Council's salary sacrifice scheme for cars scheme is capped at 120g CO₂ emission per kilometre, supporting the council's carbon reduction objectives. The scheme was launched in 2011 with support from an internal project team and officers from corporate services. The scheme was available to the Authority by a Pan-Government Procurement Framework led by **North Yorkshire** Council. As Caerphilly Council is making a saving on the employee's reduced gross salary, it is giving a monthly payment of £70 to each employee; this is cost neutral to the council.

13.5 CHALLENGES Measures related to local authority finances are perhaps some of the most politically sensitive. The ability to implement such measures is likely to vary greatly between local authorities, reflecting the different economic pressures faced across the country.

A further challenge is where measures have not previously been implemented in the UK

or in a local authority context. This could make the development and implementation of such measures more difficult. However, there is also significant political capital to be gained from being innovative, ambitious and bold with new ideas.

13.6 OUTLOOK Recent political developments have been increasing the focus on the ability of local authorities to raise and retain revenues. This increased local autonomy could theoretically bring greater ability to use financial measures to promote LEV adoption.

Any such measures will likely need to be balanced against competing priorities and challenges related to austerity and cuts to public spending. There is also a need to consider the appropriate timescales for such policies, with the inevitable need to phase out financial incentives before revenues are impacted too greatly.

One way to achieve this would be to adopt a bonus/malus type approach whereby discounts for LEVs are offset by increased charges for more polluting vehicles. This makes such policies revenue neutral for local authorities and removes the need for them to be phased out in the short to medium-term.

Rather, as the average emissions of vehicles decrease, the incentive framework can be adjusted accordingly. Such schemes also help vehicle buyers to understand the full societal cost of such vehicles.

The costs of inaction should also be factored into any justification for these measures and all others considered in this guide. In 2011, the Environmental Audit Committee noted that the costs to UK society from poor air quality are on a par with those from smoking and obesity,⁸ reducing life expectancy on average by six months at a cost of around £16 billion per annum.⁹ With many urban local authorities facing the prospect of large air quality fines, and bad air representing a considerable burden on local healthcare budgets, it is clear that a more holistic view of the costs and savings resulting from measures to promote LEVs is necessary.

FURTHER INFORMATION

Urban Foresight, EV City Casebook: 50 Big Ideas Shaping the Future of Electric Mobility
<http://urbanforesight.org/casebook.html>

Committee on Climate Change, Pathways to high penetration of electric vehicles
http://www.theccc.org.uk/wp-content/uploads/2013/12/CCC-EV-pathways_FINAL-REPORT_17-12-13-Final.pdf

⁸ House of Commons Environmental Audit Committee Report, Air Quality: A follow up report, Ninth Report of Session 2010-12, HC1024

⁹ DEFRA (2010), Valuing the Overall Impacts of Air Pollution



Image credit: National Theatre of Scotland

14 Economic Development and Tourism

14.1 INTRODUCTION

For many public sector organisations, links to economic development can be an important justification for any new investments or policy commitments. Investments in LEVs can offer such benefits. Areas where this is perhaps most apparent is related to tourism and regeneration projects.

Promoting LEVs not only offers the potential to limit the effects of climate change and poor air quality, but also to capitalise on the new economic opportunities that this will bring, such as the development of supply chains and infrastructure for LEVs.

At the national level, local initiatives can support the creation of a more secure domestic economy that is less dependent on imported fossil fuels and underpinned by new low emission technologies and services.

The individual department that takes primary responsibility for delivery of economic development services can vary across councils. Moreover, there are considerable differences between local authorities in the scale, scope, and delivery of economic development activities.

14.2
OVERVIEW

The measures considered in this chapter broadly correspond with the two areas identified in Table 14.

Table 14 – Economic development and tourism measures to promote LEVs

| MEASURE | DETAILS |
|--|--|
| Links to economic development and regeneration | Using LEVs as a centrepiece for industrial development and community regeneration |
| Links to tourism | Encouraging tourists to use LEVs in the area |
| Business support | Provision of business support services to help organisations to capitalise on commercial opportunities related to LEVs |

14.3
IMPLEMENTATION

The level at which such measures can be implemented, and the responsible departments, very much depend on the nature of the initiative or programme and the links that would need to be established to carry it out. Local authority departments that are likely to be involved include: Tourism, Economic Development, Planning, Transport (especially Sustainable Transport) and Communications. Wider commercial stakeholders are also likely to contribute to such measures including transport operators, property developers, estate managers and owners of commercial developments.

Due to the broad-ranging scope, work in this area will often be guided by high-level overarching frameworks such as tourism strategies or development plans. Organisations such as Local Enterprise Partnerships and departments for Regeneration, Enterprise and Skills may also have a role to play, to ensure effective delivery.

14.4
CASE STUDIES

Links to Economic Development

Drive Electric **Las Vegas** is an initiative that is focused on developing and growing the electric transport sector in the city and the state of Nevada. Part of its mission is to promote the economic feasibility of electric vehicles, to build support for the economic

case of the industry and create employment opportunities for the sector within the area. Through providing high-end electric vehicles in a car club, private developers are hoping to change people’s perceptions of a formerly run down area of the city, attracting new residents, workers and increasing property values.



Image credit: Richard Rayner

FOCUS ON – SUNDERLAND: LEVs AND ECONOMIC DEVELOPMENT

Nissan's pure electric vehicle, the LEAF, is manufactured in the UK's largest car plant in Sunderland. This has encouraged the city and wider region to make strategic investments to capitalise on the economic opportunities provided by this rapidly developing sector.

As expressed in the city's Corporate Plan 2012/13-2014/15, Sunderland aims to become a hub for the low carbon economy and will showcase electric vehicle projects as a part of this.

The A19 Ultra Low Carbon Vehicles Corridor Enterprise in the vicinity of the Nissan plant offering opportunities for growth, new jobs and investment in the area. The city has over 50 EV charging bays (including 30 council owned) that are free to use for up to four hours whilst charging. The University of Sunderland also recently opened the Future Technology Centre.

Links to Tourism

The Eco Travel Network (ETN) is a not-for-profit company which operates a hire and charging network for electric vehicles in the **Brecon Beacons National Park**. Established in 2012 with a grant from the Brecon Beacons Sustainable Development Fund, the ETN has a fleet of Renault Twizys which provide residents, businesses and visitors with a fun and low energy means to travel around the national park. The vehicles

are funded, hosted and hired out by ETN member businesses, which are typically accommodation providers, who share any revenues generated by the rentals. The ETN also has an additional 40 businesses that welcome and recharge visiting pure electric Twizys, including pubs, restaurants, visitor attractions and activity providers. This creates a virtuous circle where businesses are promoted to users of LEVs while the businesses themselves also promote LEVs.



Image credit: Co-Wheels

FOCUS ON – THE LAKE DISTRICT: LEV CAR SHARING AND TOURISM

In 2014 Co-Wheels together with First Pennine Rail and the Lake District Park Authority, developed a scheme allowing visitors to arrive by train and pick up a car club vehicle upon arrival to explore the area. The University of Cumbria also has bays for the Co-Wheels vehicles.

In addition, the car has a fleet of Twizy electric vehicles based in the Lake District based at hotels or tourist attractions that operates on a pay as you go basis, instead of membership – offering flexibility and short-term access.

Vehicle keys and driver approval are left with the hotelier and the main challenge that the scheme has experienced is getting buy-in from the hotels, but with a strong base now, there is more demand than available cars in the area. The company also operates a similar scheme in the Brecon Beacons.

Funding from the County Council via the Lake District Park Authority was instrumental in establishing the scheme.

Since 2009, the **Goto Islands** in Nagasaki prefecture, Japan have been working to promote sightseeing in rented electric vehicles. Solar photovoltaic (PV) stations with quick charging infrastructure are being installed and over 100 electric and plug-in hybrid vehicles are available for rental to tourists. This is further enhanced by intelligent transport systems that give tourists automated guided tours and help to easily locate charge points.

The Swiss resort **Zermatt** has restricted access to petrol and diesel vehicles since 1966. Non-electric vehicles are parked on the outskirts of the town, with electric buses and electric taxis provided to bring visitors into the centre of town. The town council issues special permits to residents wishing to own small electric vehicles; permits are also available to taxis and hotel owners subject to strict conditions such as the size of the hotel, number of guests and availability of parking.

14.5 CHALLENGES

Changes to the funding structure for large capital projects with the introduction of the Local Enterprise Partnerships (LEPs) in England may see local authorities in **competition** with each other for investment that was previously, at least in part, an element of their own budget.

By working in partnership and helping the LEPs to understand the potential for green growth and jobs through the introduction of such schemes, there is potential that many regions can still stand to benefit from integrated thinking across policy areas.

Links to economic development may be difficult to quantify, especially if the visibility of such measures being introduced is low. Measures to counter such issues include developing clearly understood terminology about the incentives available and the vehicles to which such benefits apply, which can help raise awareness of the implementation of a measure and also help to determine success criteria.

14.6 OUTLOOK

An increasing number of businesses across the UK are involved in the development and manufacture of LEV technologies and supporting infrastructure. Commitment and support of the local authorities where these companies are based can create and safeguard jobs and help to create markets for locally developed technologies and services.

Such activity can also enhance a local area's reputation as a key destination for low carbon investments and help to make local businesses more efficient, profitable and competitive by using LEVs.

In a world where travellers are increasingly mobile, and there is heightened competition nationally and globally between tourist destinations, failures to reduce noise and emissions from road transport could also have a profound effect on tourism flows – a sector which is an important contributor to many local urban and rural economies across the UK. LEVs can help protect the natural environment and assets on which this industry depends, as well as enhancing the experience of visiting these locations.

FURTHER INFORMATION

Institute of Public Policy Research, Leading the Charge: Can Britain Develop a Global Advantage in Ultra Low Emission Vehicles?

http://www.ippr.org/assets/media/images/media/files/publication/2013/04/leading-the-charge_ULEVs_Apr2013_10620.pdf

National Parks England, Getting there: Sustainable Transport in UK National Parks

http://www.nationalparksengland.org.uk/__data/assets/pdf_file/0005/336506/National-Parks-Sustainable-Transport-Case-Studies-Nov-2012.pdf

15 Conclusion

Research undertaken in developing this guide revealed the primary objective for adopting low emission policies by the local authorities surveyed is improving air quality, followed by mitigating climate change. The level of adoption is however variable and fragmented, with numerous challenges being identified. It is clear that there are many measures that have yet to be capitalised on to their full potential. A number of local authorities are showing leadership in this area and provide excellent examples of good practice. At international level, innovative policy measures have been implemented to encourage the take-up of low emission cars, vans and taxis; these provide important learnings for the UK.

Action taken at the local level can help to make LEVs more convenient, cost effective or desirable to use than higher-emitting vehicles. There are immense opportunities to exploit local policy measures to stimulate the take-up of LEVs, and facilitate the development of infrastructure for alternatively fuelled vehicles. A number of policy areas have been highlighted as particularly important – planning and parking, performance standards for a local authority’s own vehicles and their contractors, the introduction of low emission zones and targeting taxis and car club fleets which have high usage and visibility in cities. Demonstration and promotional activities to increase awareness of LEVs have a key role in improving public perception and understanding of new vehicle technologies and fuels.

Policy measures related to LEVs should be embedded across a range of council policies and strategies in order to maximise beneficial impacts. This requires collaborative work, with contributions from officers in a range of departments across a single local authority. Similarly partnership working with the private sector and wider public sector will be essential to roll out different measures and encourage LEV uptake. Policies should look to embrace air pollution and GHG emission reduction in synergy. Reviewing the impact of policies over time is advocated to ensure measures continue to achieve their goals and do not result in unfavourable consequences. Setting timeframes to amend policies in order to reflect advances in vehicle technology and introduction of more stringent emission standards and motivate ambition is additionally important.

Local policy can provide an effective framework for encouraging and incentivising the adoption of low emission light duty vehicles, it is however imperative that measures are coherent and coordinated across different regions. A patchwork of measures in different local authority areas that change across boundaries will be confusing to the public and will be less effective in stimulating early markets for LEVs.

Appendix 1

Market Share of Alternative Fuelled Vehicles

Figure A – Market Share of Alternative Fuelled Vehicles (SMMT)

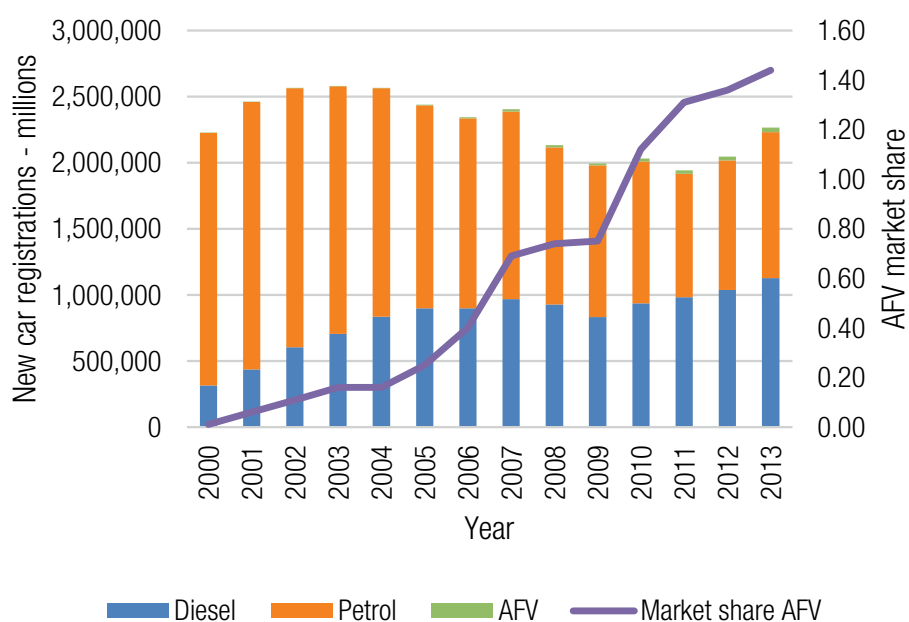
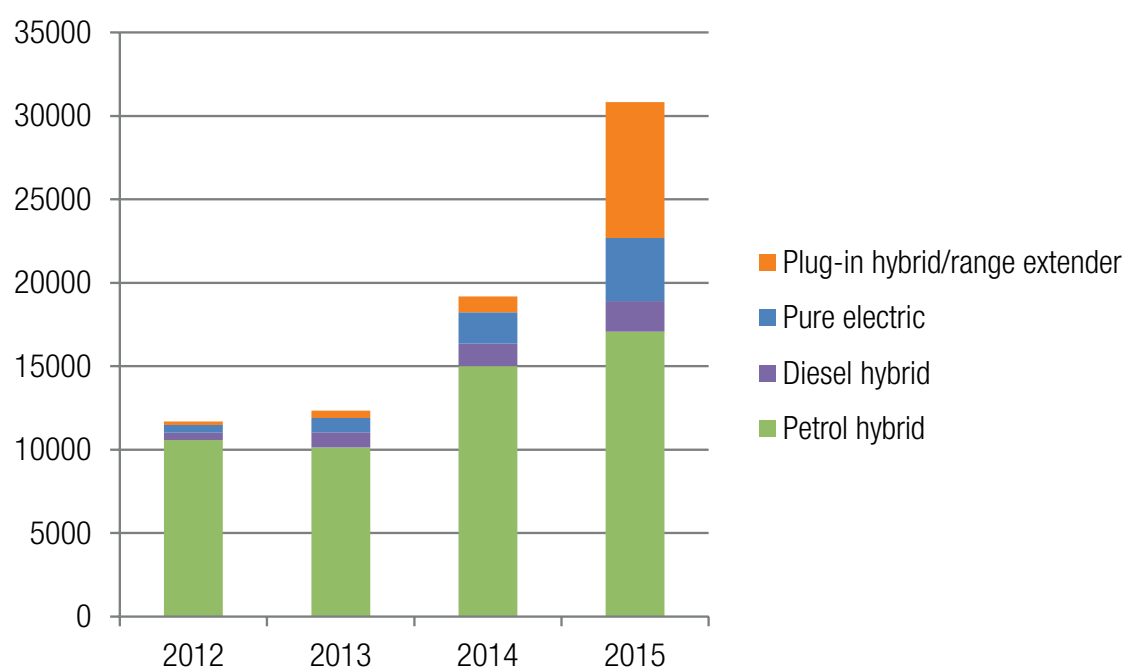


Figure B – Alternative Fuel Vehicle Registrations (SMMT)



Appendix 2

Research Participants

INTERVIEWS

27 telephone interviews were undertaken between 6th November 2014 and 9th December 2014. Interviewees were jointly identified with LowCVP and informed by the previously completed desk study research. The interview participants were comprised of:

- » 15 UK local authorities¹⁰
- » 3 European organisations
- » 3 public private partnerships
- » 4 non-government organisations involved in promoting LEVs at the local level¹¹

Of the 15 UK local authorities interviewed, 10 of these were known to be actively implementing measures to promote low emission vehicle uptake, with 5 selected that were understood to be less active in this area. The types of local authorities interviewed can be further segmented as shown in Figure C.

Figure C – Segmentation of the 15 local authorities interviewed

| | | Geography | |
|---------------|------------|-----------|-------|
| | | Urban | Rural |
| Council types | Upper Tier | 2 | 2 |
| | Lower tier | 10 | 1 |

ONLINE SURVEY

An online survey was open for participation between 4th November 2014 and 1st December 2014. The survey invite was sent to a total of 430 contacts across 123 local authorities, 6 Local Enterprise Partnerships, 2 Public Transport Executives and 5 other organisations involved at the local government level.¹²

There were a total of 92 respondents across 69 local authorities. 45 provided responses marked as complete and 47 provided partial responses. This comprised:

- » 69 UK local authorities
- » 1 Passenger Transport Executive
- » 3 other organisations involved at the local government level

The types of local authorities that responded to the survey can be further segmented as shown in Figure D. Details on the location of all of the survey respondents can be seen in Figure E.

Figure D – Segmentation of the 69 local authorities represented in the survey responses

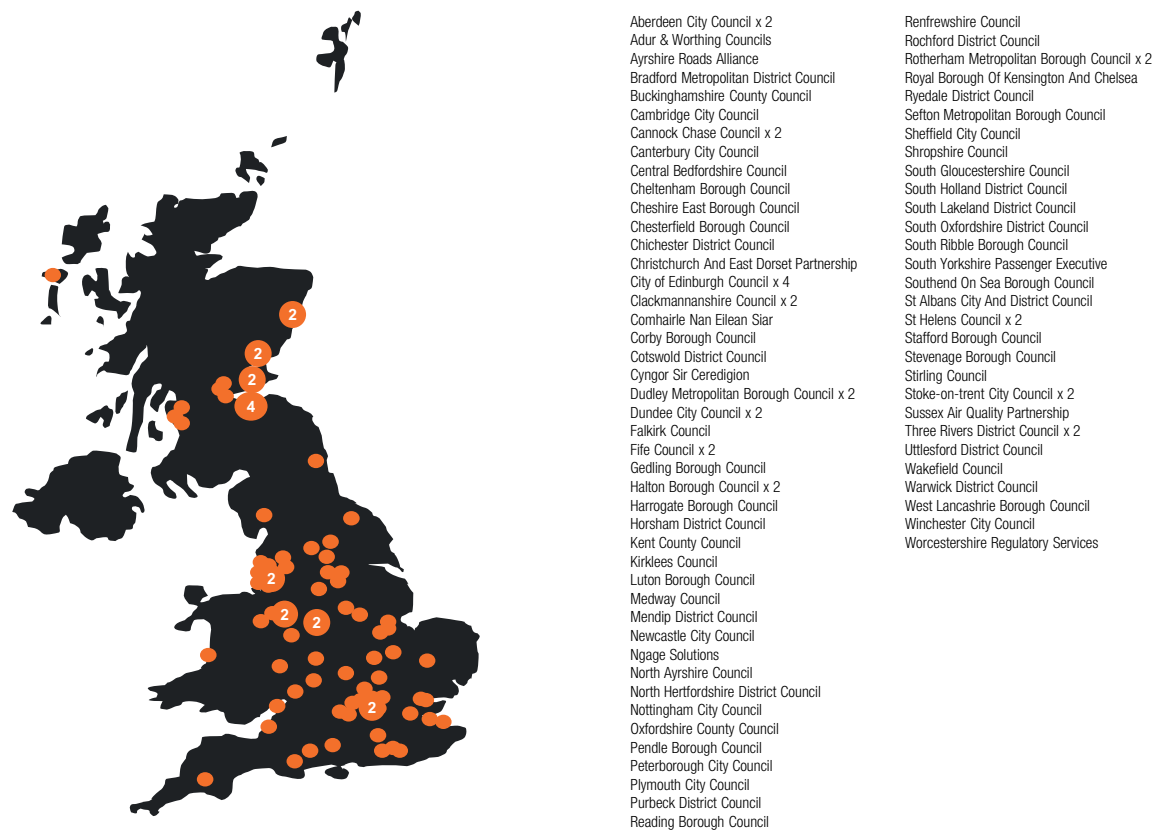
| | | Geography | |
|---------------|------------|-----------|-------|
| | | Urban | Rural |
| Council types | Upper Tier | 18 | 7 |
| | Lower tier | 24 | 20 |

¹⁰ 2 representatives of one local authority were separately interviewed.

¹¹ 1 non-government organization (IER) is based in Paris.

¹² Includes the representative body for government in NE England, a public body responsible for co-ordinating public transport services throughout Greater Manchester, a non-profit organisation and the executive body to Liverpool City Region Combined Authority.

Figure E – Geographical location of the survey respondents



Appendix 3

New Car CO₂ Emissions

Table A – New car emissions and market share (SMMT)

| | 2000 | 2007 | 2012 | 2013 |
|--|------------------|------------------|------------------|------------------|
| Average new car CO₂ emissions | 181.0g/km | 164.9g/km | 133.1g/km | 128.3g/km |
| % change on 2000 | | -8.9% | -26.5% | -29.1% |
| Share of market with CO₂ emissions | | | | |
| Up to and including 95g/km | 0.0% | 0.0% | 2.3% | 3.3% |
| Up to and including 130g/km | 0.9% | 10.6% | 55.4% | 63.3% |
| Total new car share | 2,221,647 | 2,404,707 | 2,044,609 | 2,264,737 |
| Diesel share | 14.1% | 40.2% | 50.8% | 49.8% |
| Alternatively-fuelled car share | 0.0% | 0.7% | 1.4% | 1.4% |

Glossary

| ABBREVIATION | TERM | DETAILS |
|----------------|--------------------------------------|--|
| CNG | Compressed natural gas | Methane derived from fossil fuel sources, stored at high pressure and used to power spark ignition engines. |
| EV | Electric Vehicle | A vehicle powered, in part or in full, by a battery that can be directly plugged into the mains. In short: any vehicle that can be plugged in. |
| HOV | High occupancy vehicle | A vehicle carrying a required minimum number of passengers. |
| Hybrid | Hybrid | A hybrid vehicle is powered by, either or both, a battery and an ICE. |
| ICE | Internal combustion engine | An engine which generates motive power by the burning of petrol, oil, or other fuel with air inside the engine. |
| LEV | Low emission vehicle | For description of definitions of a low emission vehicle see section 2.4. |
| LowCVP | Low Carbon Vehicle Partnership | Public-private partnership that exists to accelerate a sustainable shift to lower carbon vehicles and fuels and create opportunities for UK business. |
| LPG | Liquefied petroleum gas | Also referred to as propane or butane – flammable mixtures of hydrocarbon gases used as fuel. |
| OLEV | Office for Low Emission Vehicles | Cross-departmental office of UK government. |
| Pure-EV | Pure-electric vehicle | A vehicle powered solely by a battery charged from mains electricity. |
| PHEV | Plug-in Hybrid Electric Vehicle | A vehicle with a plug-in battery and an internal combustion engine (ICE). |
| PPP | Public-private partnership | An initiative which is operated and funded through a partnership between government and private sector representatives. |
| PTAL | Public transport accessibility level | An assessment method to determine access to public transport (distance from any point to the nearest stop and frequency of service). |
| TfL | Transport for London | Agency responsible for the operation of London's public transport network, managing the city's main roads and planning and building new infrastructure. |
| TO | Traffic Order | Statutory instruments to impose traffic restrictions such as road closures, introduction or varying of speed limits, prohibition of turns (such as right turns and u-turns) and introduction of waiting or loading restrictions. |
| TRO | Traffic Regulation Order | Another name for a Traffic Order (above). |
| ULEV | Ultra low emission vehicle | For definitions of an ultra low emission vehicle see section 2.4. |



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