LOW EMISSION STRATEGIES: SUPPLEMENTARY PLANNING DOCUMENT GUIDANCE

January 2011

Low Emission Strategies
Building on Good Practice

INTRODUCTION

The Low Emission Strategies Partnership (LESP) was formed in 2007, by the 'Delivering Cleaner Air' Beacon Councils and the UK Centre of Excellence for Low Carbon and Fuel Cell Technologies (Cenex), to promote best practice in reducing road transport emissions, primarily, through the land-use planning system and, also, by considering the ability to influence emission improvements through the implementation of integrated local transport plans and procurement strategies.

The over-arching aim of the LESP is to improve air quality and reduce Greenhouse Gas (GHG) emissions, simultaneously, by encouraging the accelerated uptake of cleaner vehicle fuels and technologies. While guidance exists to promote trip reduction and modal shift, the LESP seeks to compliment such approaches through residual, road transport emission improvements.

Funded through DEFRA Air Quality Grant, Communities & Local Government (CLG) Beacon Council - Peer Support funding and local authority contributions, the LESP undertakes programmes to promote understanding among local authorities of policies and measures that can be adopted, cost effectively, to improve detrimental emissions, thus increasing capability and capacity to effect necessary change.

Further information about the LESP can be found on the website – www.lowemissionstrategies.org

In January 2010 DEFRA published good practice guidance prepared by the LESP – ***Low Emission Strategies: Using the Planning System to Reduce Transport Emissions*** *as part of the Local Air Quality Management (LAQM) Technical Series. The report can be downloaded from DEFRA's website at -http://ww2.defra.gov.uk/environment/quality/air/air-quality/laqm/guidance/policy/*. It is also available to download from: *www.lowemissionstrategies.org*

The LESP has produced the following Supplementary Planning Document Guidance to build on the approaches outlined in the original 2010 Guidance, thus assisting local authorities wishing to promote Low Emission Strategies in their area. The Guidance provides an update on approaches to Low Emission Strategies Assessment Methodology, Low Emission Mitigation Measures (including availability and applicability of Low Emission Technology and Fuel Options) and approaches to Off-Set Formulae and Tariffs. The Guidance may be tailored to the specific circumstances of each local authority while also providing a national framework, in respect of the Low Emission Strategies approach. In producing this Guidance, it is believed that developers will also benefit from improved clarity and consistency while local authorities will be better equipped to co-ordinate, and deliver, their environmental improvement strategies.

Further assistance for local authorities implementing Low Emission Strategies can be obtained by contacting the LESP – info@lowemissionstrategies.org

PRINCIPLES OF IMPLEMENTING A DEVELOPMENT SCHEME LOW EMISSION STRATEGY

- Integrated, evidence based approach to residual, road transport emission reduction via the simultaneous assessment and mitigation of both regulated air quality pollutants and Greenhouse Gases (GHG)
- Improve residual road transport emissions via the accelerated uptake of cleaner fuels and technologies
- Recognition of road transport emissions creep, due to the aggregated impact of development schemes, and the need to improve assessment methods for establishing impact and options for mitigation
- Recognition of the incremental benefits of individual development schemes and residual road transport emissions improvement, aggregated across an area
- Pro-active, integrated approach to land-use planning with other key, local authority low emission strategies to reduce road transport emissions i.e. transport plans, community/social fleet emission improvement strategies, economic development and procurement strategies
- Achieve development scheme acceptability through the implementation of reasonably practicable on and off-site low emission mitigation measures, including the consideration of compensatory damage costs (off-set tariff), required by a combination of planning conditions and obligations
- Consideration of the use of Community Infrastructure Levy, where adopted, or in situations where it is likely to be triggered, for the implementation of low emission, road transport infrastructure

CONTENTS OF THE SPD GUIDANCE

Each local authority will develop guidance pertinent to their local circumstances, in line with national policies and strategies. This guidance seeks to provide a recommended framework of key issues to be considered, and standards that may be adopted, in pursuit of residual road transport emissions improvements, effected through development planning and control.

Local authorities may choose to follow the LES SPD guidance in developing a Low Emission Strategies SPD, however, it may be appropriate to select key components of the document and integrate them within existing, related SPD e.g. Air Quality, Transport, Sustainability or Climate Change SPD.

Recommended contents of a Low Emission Strategy SPD:

1) **Background to the SPD**
   - Local authorities may wish to provide some context as to the needs for, and benefits of, a Low Emission Strategy approach. This is likely to include the pertinent principles of the low emission strategy approach, with reference to local and national policies, regarding Local Air Quality Management and Climate Change (suggested references are provided in **Annex A**), but may also include other key strategies for reducing road transport emissions, including local transport plans, economic development and procurement strategies.

- The SPD will outline the regulated air pollutants and greenhouse gases of concern, for which emission reduction is sought, and make reference to national and local planning policies that have been introduced to assist in this process.

2) **Low Emission Assessment Methodology (LEAM)**
   - Local authorities will provide details on methodology for undertaking a low emission assessment, including the triggering development criteria and recommended tools and techniques for carrying out the scheme impact assessment and evaluating the options for mitigation
3) **Low Emission Mitigation and Off-Set Measures**
   - Local authorities should provide details of recommended low emission vehicle technologies and fuels that they would wish to see implemented as part of, either, on or off-site mitigation, associated with development scheme types. Infrastructure needed to support these measures will form part of the recommendations, including, where relevant, considerations of the Community Infrastructure Levy.
4) **Low Emission Off-Set Formulae and Tariffs**
   - Local authorities will develop formula, relevant to their local circumstances, for the consideration of compensation for the unmitigated, residual road transport emission impact resulting from a development scheme (examples of differing local authority approaches to financial contributions through the planning system can be found in **Annex C**)

Annexes:

A) Socio-Environmental Context
B) Land-Use Planning Context
C) Examples of Existing LES Related SPD
D) Sustainability and Equal Opportunities Appraisals

LOW EMISSION ASSESSMENT METHODOLOGY (LEAM)

Guidance on the assessment of development impact, to date, has been concerned with the modelling of predicted air quality concentrations, both with and without development taking place. It is acknowledged that such modelling has inherent errors, compounded by the accuracy of both input data and the capability of the modelling tools and techniques themselves.

In assessing the impact of development it may be pertinent to consider the likely exposure of future residents of a scheme to regulated air pollutant concentrations, in most cases Nitrogen Dioxide and PM_{10} (particulate matter less than 10 microns in size), or assess the increase in exposure of existing residents affected by a scheme. Local authorities usually have protocols detailing the methodology required for air pollutant concentration modelling and the development scheme criteria necessitating such modelling.

Guidance on air pollution modelling, in relation to development planning, has been produced and updated by Environmental Protection UK (EPUK 2010).

There is much evidence to show that air pollutant modelling lacks the accuracy and resolution to definitively classify the impact of a development scheme as either significant or not. The result is often described as an adversarial process between developer and local authority. The importance of meteorological data in modelling often provides wide fluctuations in output data that renders the assessment and quantification of scheme modification and mitigation scenarios irrelevant and incapable of assessing the aggregation of development schemes within an area.

Current pollution analysis of a development does not include the assessment of GHG arising from residual road transport emissions, associated with a development scheme proposal.

Given the imperative need to quantify the emissions creep, due to the accumulation of development within an area, to scenario test options for scheme mitigation and to combine the assessment of both regulated air pollutants and GHG, arising from a scheme, a Low Emission Assessment Methodology LEAM) is proposed by the Low Emission Strategies Partnership. This methodology is outlined below.

Emission assessment protocols currently exist and provide input data for air quality modelling. However, they tend to ignore the improvements that can be made to residual road transport emissions, once trip reduction analysis has been applied to a scheme. The Low Emissions Assessment Methodology (LEAM) seeks to improve current assessment techniques, standardise approaches and increase applicability, making them more relevant to the development schemes submitted to local authorities.

To assist local authorities and developers, in undertaking a LEAM, the Low Emission Strategies Partnership is developing a Low Emission Toolkit (LET). While the outlined LEAM may be undertaken using other, approved tools and techniques, the LET aims to provide a best available technique in emission analysis, capable of providing robust data that is fit for purpose in underpinning evidence based decision making. A ‘beta version’ of the LET has now been produced and testing will now be undertaken and modifications made prior to general release in 2011. Further information about the LET can be obtained by contacting info@lowemissionstrategies.org

Local authorities will determine exactly how they would like a Low Emission Assessment (LEA) to be carried out, including details of accepted tools and techniques. Emission analysis is reliant on input data and assumptions that may vary in robustness, although they are likely to improve over time. This may be recognised and a precautionary approach adopted. Where there are knowledge gaps, reasonable default data may be used, e.g. the LET provides default trip distances for a variety of land uses per given land-use both in and outside London, allowing for a calculation of overall annual GHG emissions associated with the development. It is envisaged that both developers and local authorities alike will be motivated to improve understanding of transport emissions, arising from development.

Low Emission Assessment Methodology (LEAM) Considerations

The following methodology provides a framework for a consistent approach nationally, and also allows for variations to accommodate local considerations, such as low emission mitigation feasibility, scheme viability and refinements in approach that may integrate with other environmental assessment methodologies.

The basic, recommended steps of the LEAM are summarised in **Table 1**.

Step 1 - It is essential that **pre-application discussions** take place between the local authority and the developer, to agree approaches to LEAM and scenarios for implementing low emission strategies.

Local authorities will determine development scheme criteria for triggering a LEAM, dependent on local circumstances. An example of how this may look is provided in **Table 2**. At this stage, the regulated air pollutants and GHG to be assessed should be established. The years of interest for assessment should also be agreed. The latter will be influenced by the anticipated, operational commencement and lifespan of the development, years of interest for achieving specified national targets (eg Air Quality Regulations) and availability of robust emissions data (the LET uses data projected up to 2020). Additionally, consideration of construction phases may be relevant where extended build programmes are anticipated

A LEAM will not be considered appropriate for specified small-scale development (see Table 2). However, such developments may contribute to increased road transport emissions and, as such, may be required to pay a nominal off-set tariff (for non-CIL measures) e.g. towards the cost of providing community electric vehicle recharging (EVR) facilities. Policies determining applicability of off-set tariffs should be determined according to local circumstances (see section on Low Emission Off-Set Formulae and Tariffs).

Step 2 - Using approved tools and techniques calculate the baseline residual road transport emissions from a development, for the first operational year and specified future years (dependent on future use and lifespan) after development trips have been reduced as far as is reasonably practicable. The calculation should be based on business as usual scenarios (i.e. without the introduction of low emission mitigation).

When assessing residual emissions, the evaluation should be standardised to reflect annualised emissions.

Step 3 – Evaluate the impact on residual road transport of applying low emission mitigation measures, both on and off-site, against business as usual baseline levels, for specified years of interest. Local authorities should provide a list of feasible mitigation measures that can be applied by a developer (using reasonable or best endeavours), dependent on development type. Examples of recommended Low Emission Mitigation Measures and available Low Emission Technologies can be found in **Table 3 and 4**, respectively.

Consideration is needed as to whether mitigation can be applied through planning conditions or via a Section 106 Agreement. In respect of the latter, consideration needs to be given to the three policy tests that are to be applied, i.e. that measures are necessary to make the proposed development acceptable, directly related to the scheme and are fairly and reasonably related in scale and kind etc. Details of the Section 106 policy tests are provided in **Annex B.**

Depending on development scheme type, scale and impact, local authorities may consider opportunities to introduce non-mass market technology mitigation options, thus assisting in market transformation, by accelerating the wider introduction of new technologies. It may be possible to weight technologies according to future potential and not only in respect of their current emission profiles.

***[Note** – Care is needed in evaluating off-set road transport infrastructure where Community Infrastructure Levy (CIL) has been adopted, or is likely to be triggered through infrastructure requirements on five or more developments. There is no requirement on a local authority to spend CIL funding on all infrastructure measures listed as such, nor to provide the infrastructure in any particular location (CIL removes a development from its impact). The former point is relevant when determining that a development is acceptable, the latter may be relevant if specific measures are required in relation to an Air Quality Management Area, although as final arbiter, the local authority is in a position to ensure that they are discharging their duties properly.**]*

There is the possibility that some low emission technologies may cause an increase in one emission type, while ameliorating another. For example, a diesel particulate filter (DPF) may result in a marginal increase in fuel consumption, thus marginally increasing CO_2 emissions. Local authorities will need to determine how they treat such trade-offs, depending on which emission reductions are the driving force behind their low emission strategy.(In terms of DPFs, the significant particulate reduction benefit gained from their introduction – over 85% fine particulate reduction, is likely to outweigh the marginal CO_2 increase, particularly where air pollutant exposure is of concern).

Step 4 – Once on and off-site mitigation measures have been agreed, the remaining residual road transport emissions should be quantified.

Careful consideration is needed in respect of low emission recharging and refuelling infrastructure. Such facilitating technology, necessary for the uptake of key low emission technologies, can have non-direct emission benefits. Ways to accommodate these considerations within the LEAM, should be outlined within the SPD. Alignment of approach with the wider, local authority low emission strategy is required.

***[Step 4a** - **Table 1** includes an option for applying a LEAM, allowing the introduction of a Low Emission Scheme Classification System, similar to that associated with the Building Research*

Establishment Environmental Assessment Methodology (BREEAM). Emission reduction targets could be established by development type, allowing for low emission classifications to be applied for developments achieving a specified emission reduction target or level of low emission mitigation intensity. For example, a scheme could be described as 'low emission excellent' if it meets a specified % reduction in residual road transport emissions, at a given point in time, compared with baseline levels. Low emission mitigation scenarios would be continually compared to baseline emission levels until a specified target has been met. See also ***Considerations for Streamlining LEAM****. In situations where all feasible mitigation has been exhausted and the target emission reduction has not been achieved, an off-set tariff, representing the damage costs (or ratio of) of the emission reduction shortfall could be considered.*

*The LESP will provide further guidance on this approach in 2011. Integration of LEAM with other assessment frameworks, such as BREEAM and Code for Sustainable Homes, is currently being considered by the LESP.**]***

Step 5 – Translate the calculated remaining residual road transport emissions, arising from the development scheme into damage costs for the pollutants of concern. In evaluating damage costs, consideration should be given to discrepancies in pricing, established nationally and by the EU. The pricing option chosen to evaluate damage costs should be clearly stated within the local authority SPD. Damage costs differ, dependent on pollutant type – at the discretion of the local authority, the final reckoning may refer to a single, chosen pollutant of interest or a combination of pollutants. *Further information on damage costs is available from the DEFRA Interdepartmental Group on Costs and Benefits (IGCB) – see updated DEFRA website.*

Step 6 – Local authorities will develop formulae, relevant to their local circumstances, to determine the compensation payment they would wish to levy for the residual, road transport emission impact of a development. This payment is termed the **Low Emission Off-Set Tariff** (often referred to as a developer contribution). Formulae development and Off-Set Tariff considerations are outlined in the section below – **Low Emission Off-Setting Formulae and Tariffs.**

Local authorities will determine whether to levy the tariff or not, on the basis of a fair and transparent policy laid out in the SPD.

Local authorities should provide a list of pre-evaluated low emission projects that Off-Set Tariffs will be used to fund. Such projects should be aligned to the wider, local authority low emission strategy.

Step 7 – Local authorities should maintain a database of all low emission development scheme approvals within their area. Details should be recorded of development scheme emission impacts, effect of mitigation, quantified damage costs, any off-set tariffs set and received and the low emission projects that such funding has been used for. The database should be made publicly available.

The costs of maintaining such a database may be recovered via Section 106 Agreements

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Considerations for Streamlining LEAM

Local authorities may be able to streamline their LEAM. Some, or all, development proposals within an area are often of a similar nature and would lend themselves to categorisation. Local authorities could pre-evaluate the likely residual road transport emissions impact of such schemes, informing the categorisation process. Depending on the development scheme category, local authorities could stipulate a package of recommended on and off-site mitigation measures, including the likely, additional off-set tariff that would be incurred, depending on the package of measures agreed. The mitigation measures would be pre-evaluated as to their emission benefits and, in addition to the pre-quantified damage costs, the overall low emission strategy settlement (mitigation and off-set) could be determined by a sliding scale formula.

This approach could tie in with Option 4a, discussed above, whereby scheme-classification is dependent on the implementation of pre-evaluated, categorised, mitigation measures and off-set payment, depending on development type.

Local authorities will be mindful of the advantages and disadvantages of streamlining the LEAM procedure. One disadvantage is that the onus of emissions assessment is placed, initially, on local authorities (costs may be recovered via Section 106 Agreements), however, there may be benefits arising from the integration of scheme emission impact analysis with LAQM, Local Transport Plan and Carbon reduction strategy work.

The LESP will provide further guidance on this approach in 2011.The integration of this approach with other assessment frameworks, such as BREEAM, will be considered.

LOW EMISSION TOOLKIT (LET):

The LESP is developing a Low Emission Toolkit (LET), which will assist both local authorities and developers to undertake Low Emission Assessments (LEA) of new development schemes, evaluating baseline emissions and the potential impact when applying various Low Emission Strategy mitigation options. A 'beta version' of the tool has been produced. Additional funding has been provided by DEFRA, to allow further user testing, modifications and updates.

The LET will be issued to local authorities later in 2011, free-of-charge. For further information contact **info@lowemissionstrategies.org**

Table 1 – Low Emission Assessment Methodology Summary

Assessment Steps	Assessment Activity	Notes
Steps 1	Establish the appropriate assessment based on development criteria and the relevant pollutants and years of concern	See Table 2. Pre-application discussions essential
Step 2 [Medium, Large & Major Developments]	Evaluate the residual road transport emissions baseline after trip rates have been reduced as far as is reasonably practicable	Determine 'business as usual' for both current and specified future years of interest. Use Low Emission Toolkit or other agreed techniques
Step 3	Evaluate the impact on the residual emissions by applying low emission strategy mitigation scenarios to the proposed development scheme plans, both on and off-site, for specified years of interest[1]	For mitigation options see Table 3 and Table 4. Use Low Emission Toolkit or other agreed techniques
Step 4	Quantify the remaining, residual road transport emissions, arising from the scheme, following the application of agreed mitigation measures, either on or off-site	Use Low Emission Toolkit or other agreed techniques
Step 4a	Option: Continue to apply mitigation measures, both on and off-site, until a specified emission reduction target has been achieved	Method may be used as part of Low Emission Scheme Classification System
Step 5	Establish the damage costs resulting from the remaining residual emissions	Based on pollutant emission per annum
Step 6a	Option a) Waive payment of damage cost compensation due to weighting of mitigation measures applied[2], according to local formula	This option is termed 'non-tariff' - refer to off-setting formula
Step 6b[3]	Option b) Require payment of a ratio of the damage costs, according to local formula	This is termed the 'Off-Set Tariff' (or developer contribution) - refer to off-set formula
Step 7	Final emissions data balance should be recorded in a database	A Low Emissions Strategy Database should be kept by the planning authority and made publicly available.[4]

[1] Consider whether measures form part of adopted Community Infrastructure Levy (CIL) or whether CIL is likely to be triggered (i.e. infrastructure sought on five or more developments)

[2] Local authorities may place added weight to key, strategic mitigation measures, desired as part of an overall Low Emission Strategy. The ability of a development scheme to introduce new technologies or pull technology forward, thus creating market transformation, should be acknowledged

[3] Off-set tariff cannot include funding for measures sought through the Community Infrastructure Levy (i.e .'double dipping'). Scheme viability to be taken into account

[4] Necessary costs for setting up and maintaining the Low Emissions Database should be considered as part of a Section 106 Agreement. The database should include a record of all off-set mitigation measures and tariffs (with a reference to how this funding has been used)

LOW EMISSION MITIGATION AND OFF-SET MEASURES

Local authorities should specify recommended low emission mitigation measures that may be implemented, as part of the development planning process, to secure scheme acceptability. In considering appropriate measures, local authorities may take into account:

- Development location, timescales and likely impact
- Potential that development scheme types have for assisting market innovation and transformation
- Balance short term emission benefits with those that may accrue over the longer term
- Technology and uptake incentive feasibility
- Technology emission profiles
- Technology road maps and readiness
- Desirability to promote key technologies in line with other, locally-integrated, residual road transport emission reduction strategies
- Potential economic development associated with technology and incentive options

A list of recognised, **low emission strategy scheme mitigation measures** can be found in **Table 3.** Local authorities may wish to consider these measures or others, pertinent to their area.

A list of recognised **low emission vehicle technologies and their availability** can be found in **Table 4.** Local authorities may wish to consider these technologies or others, in conjunction with recommended low emission strategy scheme mitigation.

Local authorities may wish to categorise low emission measures, based on the considerations listed above. This may assist in developing low emission scheme classification systems, such as that outlined as an option in Step 4a of the LEAM. Instead of the continual assessment of the impact of scheme mitigation options, a pre-evaluated series of recommended mitigation options and packages could be applied, dependent on the evaluated, anticipated scheme impact. An example of how low emission measures may be categorised is presented in **Table 5**.

LOW EMISSION OFF-SET FORMULAE AND TARIFFS

Local authorities will determine appropriate formula for translating scheme damage-cost compensation into a fair and transparent off-set tariff (often referred to as a developer contribution). Many local authorities currently have policies on developer contributions towards Air Quality Action Plans and Climate Change Mitigation Strategies. Examples of LES related SPD can be found in **Annex C.**

Often, contributions are based on scheme aspects, including development type (i.e. residential or commercial), floor space or parking spaces. Some emerging SPD relate to increases in trip rates. Contribution levels vary considerably from district to district, town to town and city to city. Both local authorities and developers alike have stated the need for a more consistent, evidence based approach. This is not to say that current practitioners should change their policies – if a current policy for contributions is working and fit for purpose then there may be no need to change. Examples of current developer contribution rates, required in relation to air quality and climate change, are provided in **Annex C**

Local authorities developing a Low Emission Strategies SPD will have regard to scheme acceptability and viability, plus any CIL requirements, when considering whether to levy or waive an off-set tariff. Where an emission-based approach to assessment has been taken, local authorities should consider aligning this procedure with an emission-evidenced approach to securing an off-set tariff that reflects both the impact of the development and the need to improve emissions in the wider community.

Local authorities should produce a database of low emission projects which could be funded via off-set tariffs, including a record of where such funding has been defrayed.

To assist in the development of a formula for an emission based off-set tariff, an example approach is outlined below.

Consideration will be needed as to whether the off-set tariff is determined with respect to one pollutant of interest or all pollutants of interest combined. Additionally, consideration is needed as to whether the tariff should reflect the damage costs of the first operational phase year, the damage costs over a specified number of years or the damage costs over the expected lifespan of the development.

Example Off-Set Tariff Formula:

Off-Set Tariff = **Annualised Residual Emission Damage Cost per pollutant, or sum of pollutants considered (AREDC)** [1]

Multiplied by scheme adjusted lifespan of development in years (SAL)[2]

Then

Multiplied by a local, scaling co-efficient (K)[3]**, expressed as a fraction**

Off-Set Tariff = (AREDC) × (SAL) × (K)

[1] The off-set tariff may consider a single pollutant or a sum of all pollutants considered

[2] Scheme Adjusted Lifespan – for example: year 1, aggregated first 5 years, 15 years etc., or sum of selected years e.g. years 1, 5 and 10, determined by local authority

[3] Where K represents a score from 0 to 1, based on a locally determined ranking system of development scheme low emission strategies, taking into consideration scale and impact of a development scheme, the type and scale of mitigation, applied to scheme proposals and other local factors.

TABLE 2 - LOW EMISSIONS STRATEGIES: ASSESSMENT CRITERIA & ASSESSMENT TYPE

	Classification	Minor	Medium	Large	Major
Description	A1 Food Retail	<150/200m^2	200 -500m^2	500-800m^2	>800m^2
	A1 Non-Food Retail	<200m^2	200-800m^2	800-1500m^2	>1500m^2
	A3 Restaurant Cafe	<200/250m^2	-	200/250m^2 to 2,500m2	>2,500m^2
	A4 Drinking Establishment	<200/250m^2	-	200/250m^2 to 600m2	>600m^2
	A5 H Food Take - Away	<200m^2	-	200/250m^2 to 500m2	>500m^2
	A2 Finance/Profess	<200m^2	201m^2-1000m^2	1001-2500m^2	>2501m^2
	B1 Business plus Higher Education	<200m^2	201m^2-1000m^2	1001-2500m^2	>2501m^2
	B2 Industrial Uses	<500m^2	500-1000m^2	1000-2500m^2	>2500m^2
	B8 Storage and Distribution	<500m^2	200-2000m^2	2000-5000m^2	>5000m^2
	C1 Hotels	<10 rooms	10 to 30 rooms	30 to 70 rooms	>70 rooms
	C2 Residential Inst.	-	-	All other inst.	Hospitals
	C3 Dwelling Houses	<10 dwellings	10 to 30	30 to 50	>50 dwellings
Assessment Type	Low Emission Assessment (LEA) [1]	-	Yes	Yes	Yes
	Integrated LEA and air quality exposure modelling	-	Dependent on local policy[2]	Dependent on local policy[2]	Yes
	Integrated LEA with Environmental Impact Assessment	-	-	Dependent on regulations[3]	Yes

[1] Refer to Low Emissions Assessment Methodology

[2] Refer to Local Air Quality Management Action Plans and Policies

[3] See Environmental Impact Assessment Regulations (EIA Directive 85/337/EEC as amended)

TABLE 3 – LOW EMISSION STRATEGIES: MITIGATION MEASURES

	Development Type Applicability			
Mitigation Measures	Residential	Commercial	Industrial	Notes
Construction Phase Low Emission Strategy / Scheme Elements:				
- **On-road vehicle specification[1]**	Yes	Yes	Yes	[1]See Table – Low Emission Technologies: Applicability and Availability
- **Recharge/refuel infrastructure**	Yes	Yes	Yes	[2] Denotes Non-Road Mobile Machinery
- **NRMM[2]2Specification[3]**	Yes	Yes	Yes	[3]See London Code: Reducing Emissions from Construction & Demolition Sites (Greater London Authority)
- **Sustainable delivery strategy**	Yes	Yes	Yes	
Operational Phase Low Emission Strategy / Scheme Elements:				
- **Differential parking levy[4]**	Yes	Yes	-	[4] Where charge is levied on off-street parking
- **Priority parking[5]**	Yes	Yes	-	[5] Off-street parking provision
- **Emission specified parking[5]**	Yes	Yes	Yes	[6] Option for provision by scheme off-set
- **EV dedicated parking[5]**	Yes	Yes	Yes	[7] Consideration may be required of adoption of Community Infrastructure Levy (CIL). CIL allows for capital (non-revenue) costs
- **Low Emission Taxi Rank[5,6,7]**	-	Yes	Yes	[8] Recommended/required via contract/restrictive covenant
- **Alternative fuel infrastructure[6,7]**	Yes	Yes	Yes	[9] Incentives may include store/club card /leisure facility discounts etc
- **Fleet emission specification[1]**	-	Yes	Yes	[10] Information internet/other media concerning low emission strategy options,/impact of options
- **Fleet emission strategy[1]**	-	Yes	Yes	[11] Consideration to segregation of waste, capable of providing renewable fuel, and disposal/processing into low emission fuels
- **Procurement strategy[1,8]**	-	Yes	Yes	[12] Local authorities may consider upgrade of vehicle technologies concerning RCVs/vans and community transport provision
- **Bicycle/E- bike rental scheme[6,7]**	Yes	Yes	Yes	
- **Car club[6,7]**	Yes	Yes	Yes	
- **Low Emission car club[6,7]**	Yes	Yes	Yes	
- **Resident incentives[9]**	Yes	-	-	
- **Employee incentives[9]**	-	Yes	Yes	
- **Visitor incentives[9]**	-	Yes	-	
- **Information networks[6,10]**	Yes	Yes	Yes	
- **Waste to fuel segregation, collection/process[6,7,11,12]**	Yes	Yes	Yes	

Supporting Low Emission Community Provision:				
- **Low Emission Bus Provision/Routes**[6,7]	**Yes**	**Yes**	**Yes**	
- **Low Emission Waste to Fuel Collection and Process** [6,7,11,12]	**Yes**	**Yes**	**Yes**	
- **Low Emission/Local Authority Social Fleet Provision**[1,6,7,12]	**Yes**	**Yes**	**Yes**	
- **On-road Re-charging Infrastructure**[6,7]	**Yes**	**Yes**	**Yes**	
- **Low Emission Taxi Rank**[6,7]	**Yes**	**Yes**	**Yes**	
- **Low Emission Taxi/Mini-bus Provision**[6,7]	**Yes**	**Yes**	**Yes**	
- **Community Incentives**[6,9]	**Yes**	**Yes**	**Yes**	

TABLE 4 – LOW EMISSION TECHNOLOGIES: AVAILABILITY & APPLICABILITY

LOW EMISSION TECHNOLOGIES	AVAILABILITY			APPLICABILITY
	Mass Market	Fleet Demonstration	Prototype	Residential (R), Commercial (C), Industrial (I):
LOW EMISSION VEHICLES:				**Denotes Off-set possibility*
Bicycle	Yes	-	-	*Provision of dedicated paths/routes (R, C,I)**
Electric Bicycle	Yes	Yes	-	*Recharge/refuel infrastructure (R, C,I)**
Fuel Cell Bicycle	-	-	Yes	*Rental schemes (R, C,I)**
Electric Scooter	Yes	-	-	*Information networks (R, C,I)**
Fuel Cell Motorcycle	-	-	Yes	*Purchase & maintenance support (R, C, I)**
				Low Emission Zones/Schemes (R, C, I)
Euro Emission Standard 5:				**Consideration as to CO2 rating may be relevant*
***Car[1]**	2009			*[1]Mandatory for new vehicle production*
Lorry[1]	2009			*[#]Denotes Enhanced Environmental Vehicle-*
Bus[1]	2009			*standard similar to Euro 6*
Euro Emission Standard 6/EEV[#]:				*[2] Mandatory for new vehicle production.*
***Car[2]**	2013			*Widespread availability of EEV standard*
Lorry[2]	2013			*[3]Date for mandatory standard introduction TBC.*
Bus[2]	2013			*Availability of vehicles likely to meet standard*
Euro Emission Standard 7:				*[4]Date for mandatory standard introduction TBC.*
***Car[3]**	TBC			*Current availability of vehicles likely to meet*
Lorry[4]	TBC			*standard*
Bus[4]	TBC			*(R,C, I)**
Electric Car (EV)	Yes (basic battery)	Yes (advanced battery)	Yes	*Car clubs (R, C, I)**
Range Extended Electric Car	-	-	Yes	*Recharge/refuel infrastructure (R, C, I)**
Hybrid Electric Car (HEV)	Yes	-	-	*Priority Parking (R, C)**
Plug-in Hybrid Electric Car (PHEV)	-	Yes	Yes	*Differential Parking Levy (R, C)**
Flex-fuel car (Liquid bio-fuel)	Yes	Yes	Yes	*Rental schemes (R, C, I)**
Bi-Fuel Car (CNG/Petrol)	Yes (retro-fit/left HD))	Yes (right hand drive)	Yes	*Information networks (R,C,I)**
CNG Car	Yes (left hand drive)	Yes (right hand drive)	-	*Purchase & maintenance support (R, C, I)**
LPG Car	Yes (retro-fit)	-	-	*Low Emission Zones/Schemes (R, C, I)*
H2 ICE Car	-	Yes	Yes	

Fuel Cell Car	-	Yes	Yes	
Electric Taxi	-	Yes	Yes	*Recharge/refuel infrastructure (R, C, I)**
Hybrid Electric Taxi	-	Yes	Yes	*Rank/Priority Parking Facility (R, C)**
Plug-in Electric Hybrid Taxi	-	-	Yes	*Rental schemes (R, C)**
Bi-fuel Taxi (CNG/Petrol)	Yes (retro fit)	Yes	Yes	*Information networks (R,C)**
CNG Taxi	Yes (left hand drive)	Yes (right hand drive)	-	*Purchase & maintenance support (R, C, I)**
Flex Fuel Taxi (Liquid bio-fuel)	-	Yes	Yes	*Low Emission Zones/Schemes (R, C, I)*
LPG Taxi	Yes (retro fit)	-	-	*Procurement Specification (C, I)*
H2 ICE Taxi	-	-	Yes	
Fuel Cell Taxi	-	-	Yes	
Electric Car-Van	Yes	-	-	*Recharge/refuel infrastructure (R, C, I)**
Electric Van (3.5t/6m2)	Yes	-	-	*Priority Parking Places (R, C,I)**
Mild Hybrid Electric/Diesel Van	Yes	-	-	*Rental schemes (R, C,I)**
Full Hybrid Electric/Diesel Van	-	Yes	Yes	*Information networks (R,C,I)**
Bi-fuel Van (CNG/Petrol)	Yes	-	-	*Purchase & maintenance support (R, C, I)**
Dual – fuel Van (LNG/Diesel)	-	Yes	Yes	*Procurement Strategy Specification (R, C, I)*
CNG Van	Yes	-	-	*Low Emission Fleet Strategy Specification (R, C, I)*
LPG Van	Yes (retro fit)	-	-	*Low Emission Zones/Schemes (R, C, I)*
H2 ICE Van	-	Yes	Yes	
Fuel Cell Van	-	-	Yes	
Electric Truck (7.5t)	Yes	Yes	Yes	*Recharge/refuel infrastructure (R, C, I)**
Hybrid Electric/Diesel Truck	Yes	Yes	-	*Priority Parking Places (R, C ,I)**
CNG Truck/Lorry	Yes	Yes	-	*Rental schemes (R, C, I)**
Hybrid Electric Diesel Lorry	Yes	Yes	-	*Information networks (R,C, I)**
LNG Truck/Lorry	Yes (Left Hand Drive)	Yes	-	*Purchase & maintenance support (R, C, I)**
Dual – fuel Lorry (LNG/Diesel)	Yes	-	-	*Procurement Strategy Specification (R, C, I)*
Pure Plant Oil Truck/Lorry	-	Yes	Yes	*Low Emission Fleet Strategy Specification (R, C, I)* *Low Emission Zones/Schemes (R, C, I)*

Electric Mini-bus (<or=16 seats)	-	Yes	Yes	*Recharge/refuel infrastructure (R, C, I)**
Hybrid Electric/Diesel Mini-bus	Yes	Yes	-	*Priority Parking Places (R, C)**
CNG Mini-bus	Yes	-	-	*Supported Rental schemes (R, C, I)**
Fuel Cell Mini-bus	-	-	Yes	*Information networks (R,C)**
Electric Bus (>16 seats)	Yes	Yes	-	*Purchase & maintenance support (R, C, I)**
Hybrid Electric/Diesel Bus	Yes	Yes	-	*Procurement Strategy Specification (R, C, I)*
Bio-fuel Bus (Ethanol)	-	Yes	-	*Low Emission Fleet Strategy Specification (R, C, I)*
Hybrid Electric /CNG Bus	Yes (in US)	Yes (left hand drive)	Yes	*Low Emission Zones/Schemes (R, C, I)*
CNG Bus	Yes (Left Hand Drive)	-	Yes	
LNG Bus	Yes (left Hand Drive)	-	-	
Dual-Fuel Bus (LNG/Diesel	-	Yes	Yes	
H2 ICE Bus	-	Yes	Yes	
Fuel Cell Bus	-	Yes	Yes	
LOW EMISSION FUELS:				
Electric Vehicle Recharging	Single/3 Phase	Single/3 Phase/Fast	Rapid/ Induction	*See Table 5 – Electric Vehicle Recharging Infrastructure*
Compressed Bio/Natural Gas (CBG/CNG)	Established worldwide network, except UK	Fast and slow fill (UK)	-	
Liquified Bio/Natural Gas (LBG/LNG)	Established worldwide network, limited to HGV fleet depot UK	Yes	Yes	
Liquid Petroleum Gas (LPG)	Yes	-	-	
Ethanol	Regional availability eg Norfolk	Yes	-	
30% Bio-diesel	Regional availability eg Norfolk	Yes	-	

100% Bio-diesel	Regional availability eg Norfolk	Yes	-	
H2 (Brown/Green)	Widespread network California	Yes	Yes	
LOW EMISSION ABATEMENT TECH				[#]*Consideration as to provision as part of construction phase. For Non-Road Mobile Machinery (NRMM) vehicle suitability refer to London Code of Construction Practice: Control of Emissions from Construction and Demolition Sites (Greater London Authority)*
Catalytic Converter	Yes	-	-	
Diesel Particulate Filter (DPF)[#]	Yes	-	-	
Exhaust Gas Recirculation (EGR)	-	Yes	-	

Note:

- Low Emission Technology recommendation/specification is dependent on development scheme impact, viability and pre-determined planning authority strategy
- Local planning authorities may add weighting to non-mass market technologies, in terms of assessing their impact, to encourage market transformation

Table 5: RECOMMENDED ELECTRIC VEHICLE RE-CHARGING (EVR) INFRASTRUCTURE PROVISION FOR NEW DEVELOPMENTS

DEVELOPMENT TYPE	BASIC	STANDARD	ADVANCED	OFF-SET TARIFF[#]
RESIDENTIAL:				
House with off-road parking	Single Phase[*] 1 point per unit	Single Phase[*] 1 point per unit	Single Phase[*] 1 point per unit	Contribution to wider community provision[1]
House with on-road parking	Single Phase[*] 1 point per 10 units[1]	Single Phase[*] 2 points per 10 units[1]	Single Phase[*] 3+ points per 10 units[1]	Contribution to wider community provision[1]
Flats/Apartments	Single Phase[*] 1 point per 10 parking spaces (or per 10 units[2])	Single Phase[*] 2 points per 10 parking spaces (or per 10 units[2])	Single Phase[*] 3+ points per 10 parking spaces (or per 10 units[2])	Contribution to wider community provision[1]
COMMERCIAL:				
Leisure / Retail	Single/3 Phase[*] 1 point per 200m2	Single/3 Phase/Accelerated[*] 2 points per 200m2	Single/3 Phase/Accelerated[*] 3+ points per 200m2	Contribution to on-street provision using same ratios[2] Contribution to wider community provision[1]
Business, Higher Education & Hospitals	Single/3 Phase[*] 1 point per 200m2	Single/3 Phase/Accelerated[*] 2 point per 200m2	Single/3 Phase/Accelerated[*] 3+ points per 200m2	Contribution to on-street provision using same ratios[2] Contribution to wider community provision[1]
Hotels & Residential Inst.	Single/3 Phase[*] 1 point per 30 rooms or per 10 parking spaces	Single/3 Phase/Accelerated[*] 2 points per 30 rooms or per 10 parking spaces	Single/3 Phase/Accelerated[*] 3+ points per 30 rooms or per 10 parking spaces	Contribution to on-street provision using same ratios[2] Contribution to wider community provision[1]

INDUSTRIAL: Distribution & Storage	Single/3 Phase/Accelerated* 1 point per 10 parking spaces (employees/visitors) Commercial vehicle re-charging provision as required [3]	Single/3 Phase/Accelerated* 2 points per 10 parking spaces (employees/visitors) Commercial vehicle re-charging provision as required [3]	Single/3 Phase/Accelerated* 3 points per 10 parking spaces (employees/visitors) Commercial vehicle re-charging provision as required [3]	Contribution to wider community provision[1] Contribution to wider community provision[1]

Note:

- Electric vehicle re-charging is classified as permitted development
- Low emission vehicle infrastructure may form part of Infrastructure Delivery Plans, developed as part of PPS12 – Local Spatial Planning, requirements
- In line with requirements of PPS1 (as amended), provision may be subject to development scheme viability. In determining viability, the emissions impact of a development scheme will be a material consideration
- In determining electric vehicle recharging needs, provision should be consistent with specified, maximum parking standards, appropriate to both land use and location, as recommended in PPG13 – Transport.
- Single Phase = 13amp/32amp. A passenger car will normally fully charge in 8 hours with 13A supply or provide a 30% charge in 2 hours.
- 3 Phase = 32amp/64amp supply

* Dependent on prevailing vehicle technology requirements. Enabling cabling for provision and upgrade should be provided to 40/50% of parking space provision in anticipation of future requirements, even in circumstances where re-charging provision is not deemed viable from the commencement of the operational phase of the development. Accelerated charging refers to rapid (DC) systems. This technology is at the prototype stage and may not be feasible in relation to certain vehicle warranties.

Where provision is not identified as part of Community Infrastructure Levy and contribution is sought for <5 development schemes until 2014.

[1] As per #. Dependent on low emissions assessment and local area need. Requirement included as part of a Section 106 agreement, Town & Country Planning Act 1990, as amended by the Planning and Compensation Act 1991, Section 12.

[2] As per [1]. Where no dedicated, off-street parking is provided as part of the development scheme or where on-site provision is not feasible.

[3] Provision determined following low emission assessment and required as part of a Low Emission Fleet Strategy

ANNEX A

Socio-Environmental Context

It is important that Low Emission Strategies are underpinned by coherent, socio-environmental policies, adopted at a local level, in line with National Strategies. These should include:

- **National Air Quality Strategy 2007**, including associated Local Air Quality Management Policy and Technical Guidance 2009
- **Local Air Quality Action Plans**, including reference to **Air Quality Management Areas**, where designated. Such plans should integrate all relevant council activity, capable of effecting emission reductions, including fleet management plans, alternative fuel infrastructure plans and procurement strategies. In London, consideration will be given to the Mayor's Air Quality Strategy 2010)
- Climate Change or Carbon/Greenhouse Gas (GHG) reduction strategies
- Environmental Impact Assessments Directive (EIA Directive 85/337/EEC as amended)
- Health Improvement Plans and Strategies
- Other relevant local and regional strategies e.g. Economic Development etc

In articulating the benefits of tackling GHG and air pollutant emissions simultaneously, reference should be made to relevant Government guidance, including '**Air Quality: Action in a Changing Climate (DEFRA, 2010)**.

The Mayor for London's Air Quality Strategy (2010) refers to the benefits of implementing a Low Emission Strategies approach to development planning and states the requirement for an emissions assessment to be provided alongside any air quality assessment submitted as part of a planning application.

Reference should be made to the co-ordination of the low emission strategy approach through either **Local Transport Plans (LTP2 and 3)** or **Local Implementation Plans** (delivery of the **Mayor's Transport Strategy** by London Councils).

ANNEX B

Land-Use Planning Context

The Government is revising planning guidance with a view to simplifying the Planning and Policy Statement guidance system. Additionally, local authorities are to take account of 'localism' within the revised planning system. Regional planning guidance has been removed. While the new system becomes apparent it is clear that the Government would like to see planning policy enable motorists to make green vehicle choices, particularly enabling the uptake of electric vehicles.

The approach outlined within this guidance is in line with emerging Government Policy and the LESP will provide further guidance on implementing LES through the Planning System where needed. The following information remains pertinent until further guidance is issued.

By its very nature, local land-use planning policy represents the consideration of all key council policies and strategies, with the aim of realising the integrated delivery of such plans for the benefit of existing and future, local communities. Key council policies will include, Local Transport Plans, Air Quality Action Plans and Climate Change Strategies. It is important ensure that Low Emission Strategy principles and aims are integrated within all such plans. The manifestation of the integrated approach to land-use planning should be detailed within a **Local Development Plan** or **Framework**.

Guidance exists at a national level that sets out the regulatory basis for implementing Low Emission Strategies through the land-use planning system. In the first instance, see best practice guidance – '**Low Emission Strategies - Using the Planning System to Reduce Road Transport Emissions'**, Defra (2010).

The Government is currently revising the Planning and Policy Statement system with a view to simplifying guidance. While the planning guidance system is in a state of flux, the following formal guidance is still applicable, subject to announcements and amendments known to date:

- Planning and Policy Statement 23 – Pollution Control & Contaminated land:
    - States that air quality is a material consideration in the planning process
    - States that national and international strategies and conventions on air quality and climate change should be taken into account
    - Introduces the 'precautionary' and 'polluter pays principle'
    - States that aggregated impacts of developments should be considered
    - States that planning process should be a force for positive change
    - Introduces concept of off-setting the impact of development
- Planning and Policy Statement 4 – Planning for Sustainable Economic Growth
- Planning and Policy Statement 12 – Local Spatial Planning
- Planning and Policy Guidance 13 – Transport
- Draft Planning and Policy Statement Development Management (consultation finished 17th March 2010 – takes into account Killian Pretty Review):
    - States the need for pro-active engagement from outset to delivery
    - To include revised policy tests for Section 106 Agreements, in annex. These are:
        1) *Necessary to make the proposed development acceptable in planning terms*
        2) *Directly related to the proposed development*
        3) *Fairly and reasonably related in scale and kind to the proposed development*
- Community Infrastructure Levy Regulations 2010
- The London Plan 2010 and Mayor's Air Quality Strategy for London 2010

ANNEX C

Several local authorities have produced SPD that relate to Low Emission Strategies, including requirements for developers to pay for off-site initiatives relating to air quality and climate change. The following examples are provided:

Croydon Council draft Air Quality SPD (www.croydon.gov.uk)

The draft SPD requires that a Low Emission Strategies approach to development scheme mitigation is adopted. Developer contribution levels (off-set tariff) and measures they will support in line with the Air Quality Action Plan (AQAP) are outlined:

- Assistance with enforcing vehicle idling regulations
- Contributions towards improving HGV emission improvements through a Freight Quality Partnership
- A contribution towards AQAP delivery is costed per development parking space

Greenwich Council Section 106 Agreements SPD (www.greenwich.gov.uk)

Developers are required to contribute the following rates towards air quality and waste management measures:

- £100 per residential dwelling towards both AQ and Waste
- £10 per sqm commercial development towards AQ and Waste

Greenwich have used AQ funding towards a variety of mitigation measures including electric vehicle recharging infrastructure and gas vehicle demonstration, to inform the Council's Anaerobic Digestion Strategy

Kensington and Chelsea Air Quality SPD (www.rbkc.gov.uk)

A low emission strategies approach to scheme mitigation is requested with developer contributions sought for low emission vehicle technology and infrastructure projects, public transport improvements and air quality action plan funding. An emissions assessment and site specific low emission strategy is required for specified schemes.

Merseyside (Policy Note Update to Ensuring Choice of Travel SPD) www.sefton.gov.uk

The Liverpool City Region has agreed a policy update to the Ensuring Choice of Travel SPD to require electric vehicle recharging provision to a minimum of 10% of parking spaces on new developments.

Mid Devon Air Quality SPD (www.middevon.gov.uk)

Mid Devon is currently revising planning policy to integrate Low Emission Strategies concepts within their Infrastructure and Site Allocation Plans. The Air Quality SPD currently requires developers to contribute towards 50% of the costs of delivering the Air Quality Action where applications are made in either Crediton or adjoining areas, or other settlements specified in the Core Strategy, according to the following criteria:

Market housing	-	£2800 - £5509 per dwelling
Affordable housing (100%)	-	£0
Employment	-	£1000 - £2030 per 100 sqm ground floor area (GFA)
Retail Food	-	£55,500 - £103,449 per 100 sqm GFA
Retail non-Food	-	£9000 - £17616 per 100 sqm GFA

Milton Keynes (www.milton-keynes.gov.uk)

A tariff of approximately £8,000 is levied on residential dwellings towards the Council- wide carbon reduction programme.

Salford (www.salford.gov.uk)

Developer contributions are levied at £200 per residential dwelling and £2 per sq metre of commercial floor space towards climate change mitigation, including peatland restoration and tree planting programmes.

Waltham Forest (www.walthamforest.gov.uk)

Waltham Forest require developer contributions towards air quality action plan measures, including up to £750 per development parking space

Wigan (www.wigan.gov.uk)

Wigan has an established Air Quality SPD that requires developers to off-set their emissions through contributions to fund air quality action plan measures (see p. 26 of the SPD, which is available online at: http://www.wigan.gov.uk/Services/Planning/Policies/DevelopmentFramework/DevelopmentAirQuality.htm).

York

York is currently producing a LES SPD that will be issued in 2011. Further details on the development of the SPD can be found on their LES Region Group Initiative website ***(www.lcrrgi.org.uk)***

ANNEX D

Sustainability and Equal Opportunities Appraisals

In preparing an SPD, Sustainability and Equal Opportunities Appraisals should be undertaken, however, if these have been carried out as part of Core Planning Strategy development then this is considered sufficient. A statement should be included in the SPD to this effect. It is possible that the LESP may consider providing assistance, if required, in providing outline details to undertake such appraisals.