Developing a Low Emission Strategy

Briefing Note

Maidstone Borough Council

May 2016

Low Emission Strategies Ltd

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Executive Summary

Levels of Nitrogen Dioxide (NO_2) in Maidstone in the urban area and in the vicinity of the strategic road network exceed Government Objectives and legally binding European Union (EU) Limit Values, leading to measurable health impacts on the local community. The major cause of these elevated levels is the emissions from road transport. The UK Government is facing infraction proceedings by the EU and under the reserve powers of the Localism Act 2011, any fines imposed by the EU can be passed onto any public authority whose 'act or omission' has contributed to the breach.

In 2015, the Government (DEFRA) published plans to improve air quality in the UK and includes the requirement that all authorities with elevated levels of NO_2 should consider implementing a *Low Emission Strategy (LES)* to tackle vehicle emissions by accelerating the uptake of cleaner vehicles.

Maidstone Borough Council (MBC) has undertaken significant preliminary work, including promoting co-ordinated action with neighbouring Kent Authorities, and is seeking to develop and implement a LES as part of its plans to improve air quality and health.

This briefing note explains what a LES is and the scope of the areas it may cover. Using examples of best practice from other authorities in the UK who have, or are in the process of, implementing LES, the document highlights feasible measures that could be introduced cost-effectively to reduce vehicle emissions and discusses implementation mechanisms that may be used. In outlining possible approaches to the development and implementation of the LES, this note highlights measures that MBC can introduce in creating a low emission future and also discusses a selection of vehicle specific measures that could be introduced in partnership with key stakeholders.

Key plan aspects for delivering the objectives of the LES are discussed, including the targeting of national funding streams and opportunities for levering inward investment through partnerships with private sector stakeholders.

1 Background

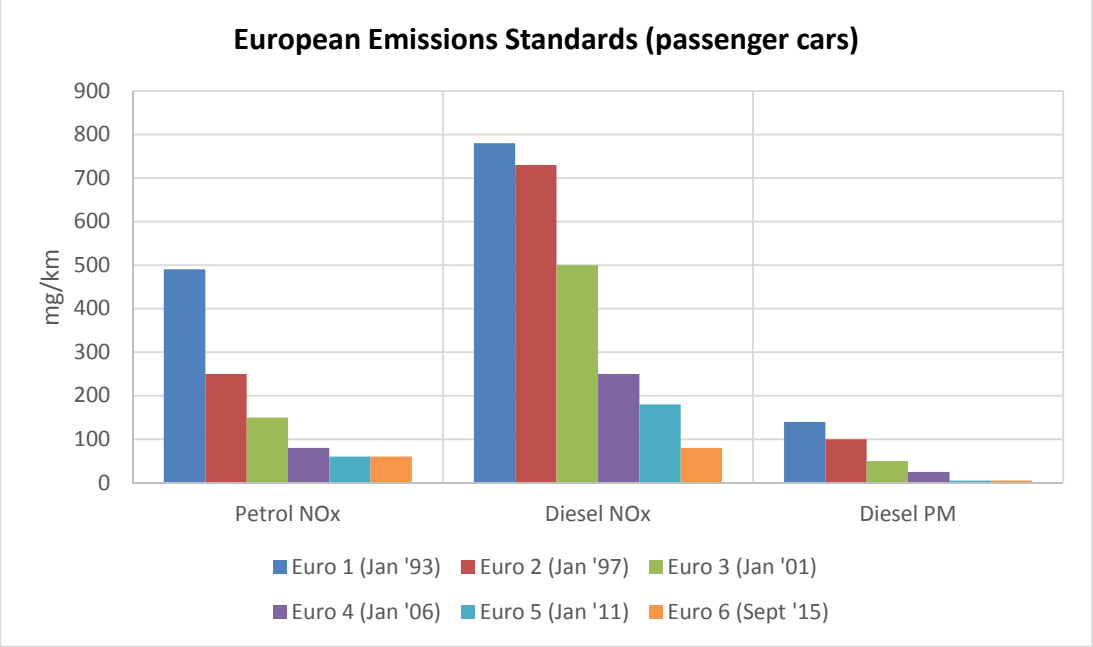
1.1 MBC has designated an extensive urban Air Quality Management Area (AQMA) due to elevated levels of nitrogen dioxide (NO_2) in the vicinity of the urban and strategic road network. The most significant contributor to these elevated levels is the emissions from road transport, particularly diesel cars, buses, vans and lorries. Vehicle emissions are also the most significant source of fine particulates in the urban area and also account for around a third of carbon dioxide (CO_2) emissions.

1.2 Our understanding of the health impacts of NO_2 is increasing. In 2015 the Government published new data to show that NO_2 accounts for 23,500 deaths in the UK[1] each year.

1.3 Levels of nitrogen dioxide (NO_2) have remained stubbornly elevated over the last decade as action to improve air quality has stuttered for several reasons.

Firstly, because over-optimistic predictions of future air quality have encouraged the belief that things would get better on their own, as newer vehicles, required to meet more stringent emission standards, enter the fleet (see figure 1). Evidence has shown that many new vehicles emit far more oxides of nitrogen (NOx, a precursor for NO_2) in real-world driving than in tests by manufacturers.

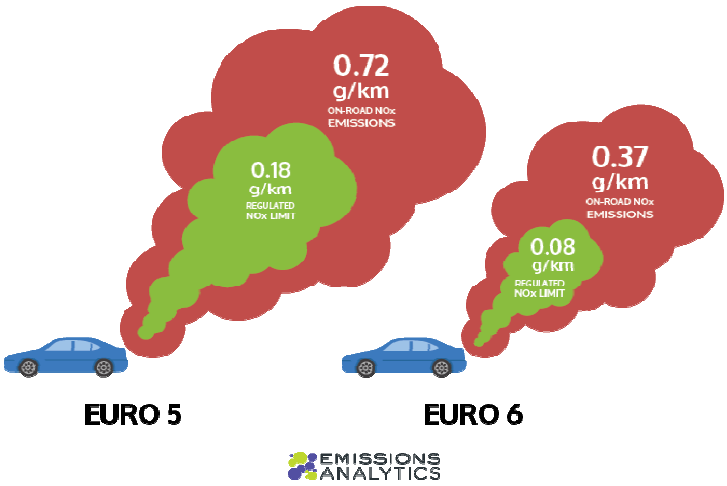
Figure 1 - European Emission Standards for passenger cars



[1] Improving air quality in the UK, Tackling nitrogen dioxide in our towns and cities, UK overview document, December 2015, DEFRA

Secondly, national guidance on Local Transport Plans (LTP) has not been helpful. Guidance for LTP1 and LTP2 recognised the importance of tackling air pollution, however, Government modelling assumed that air quality issues would be solved and, therefore, guidance for LTP3 focussed on CO_2 reductions.

Figure 2 - Real world emissions of NOx from diesel cars



Thirdly, there has been an increase in focus on reducing carbon emissions with some measures adversely affecting air quality. The Government has encouraged diesel car sales through reduced Vehicle Excise Duty (VED)[2] with sales increasing from 20% of cars bought to 60% within 15 years[3]. We now know that even the newest diesel cars can emit significantly far more NOx than petrol cars and certainly more than the manufacturer's tests claim. See figure 2.

1.4 Under the requirements of the Environment Act 1995, MBC has produced an Air Quality Action Plan (AQAP, 2010), however, the evidence base on which the plan was developed has changed, as we now recognise the significant impact that diesel car emissions have on air quality. Some of the measures listed in the AQAP have not been implemented and their impact on air quality in Maidstone was not possible to quantify. A key issue surrounds the accuracy and sensitivity of air quality modelling to predict air quality changes arising from potential measures. Another issue concerns the over reliance on traffic reduction measures that have not materialised.

1.5 In 2013/14, MBC undertook a Low Emission Zone (LEZ) Feasibility Study for the town centre. While the study indicated that significant air quality improvements could be made by improving bus emissions, it concluded that the benefits of introducing a LEZ for other types of road vehicles would outweigh the costs. It should be noted that damage costs

[2] https://www.gov.uk/government/publications/vehicle-excise-duty
[3] www.smmt.co.uk

(societal cost of pollution) have increased significantly since the study as our understanding of the health impacts of pollution increases[4].

1.6 Recognising that a LEZ is simply a Low Emission Strategy (LES) that is implemented and enforced in a defined geographic area, MDC began developing a LES in 2014 that would target cost effective measures for reducing specific vehicle emissions without the need for costly enforcement mechanisms. As road transport emissions are the main source of elevated NO_2 levels in the Maidstone AQMA, the LES would target feasible vehicle emission reduction measures, supported by an overarching and integrated public sector policy approach, including key stakeholder engagement. The LES would be a clear and concise, public facing plan that would form part of the Maidstone AQAP, when updated. While air quality concentrations are influenced heavily by the weather, the LES would focus on issues that can be controlled – emissions from road transport, by accelerating the uptake of cleaner fuels and technologies.

1.7 While the focus of the strategy would be the reduction of NOx emissions (oxides of nitrogen that are a precursor for NO_2) to levels that help achieve the EU Limit Value, the LES would provide a structure for continued improvements that will benefit the health of residents. The LES would provide win-win scenarios where possible, seeking to reduce vehicle emissions of fine particles and CO_2. Such an approach has the possibility of creating a platform for inward investment as we move to a green economy.

1.8 As levels of NO_2 in the UK, including Maidstone, exceed the binding EU Limit Value, the European Commission has commenced infraction proceedings against the UK Governments and Devolved Administrations. Under the reserve powers of the Localism Act 2011[5] any fines issued may be passed onto any public authority whose act or omission has led to the breach in EU law. The UK Supreme Court has already ruled that the Government is not complying with EU law and required the Government to publish plans to improve air quality by 2015 at the latest.

1.9 In December 2015, DEFRA[6] issued plans to improve air quality in the UK[2]. Among the measures included, the plan states that;

*"As a minimum **we expect all local authorities with areas currently exceeding the required levels to consider putting in place a Low Emission Strategy**. Such a Strategy could be used to set out a range of commitments and actions to tackle pollution as part of a coherent multi-year programme and ensure they identify and exploit the national assistance available."*

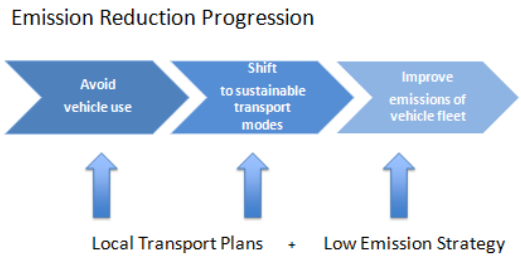
[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460401/air-quality-econanalysis-nitrogen-interim-guidance.pdf
[5] http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted
[6] Department for the Environment, Farming and Rural Affairs

2 What is a Low Emission Strategy?

2.1 Low Emission Strategies (LES) first emerged following the Thames Gateway Bridge Public Inquiry in 2006, where Greenwich Council and local residents argued that the scheme should be subject to a Low Emission Zone (LES) whereby the proposed tolls would be set to encourage the use of low emission vehicles. Transport for London (TfL) argued that this would cause confusion as the London Mayor was proposing to introduce a London-wide LEZ. The Inspector ruled that the scheme would instead be subject to a Low Emission Strategy for both construction and operational phases.

2.2 Since then, local authorities have been developing LES, partly as an alternative to implementing LEZ, but also recognising the wider benefits of an overarching and integrated vehicle emission reduction approach compared with the more prescribed approach of an Air Quality Action Plan (AQAP) that focuses solely on NO_2 levels. While national transport and travel planning guidance has tended to focus on measures to avoid using vehicles and shifting to sustainable transport modes as a key approach to solving air quality problems, a Low Emission Strategy (LES) acknowledges that we can go further and promotes an *emission reduction progression* that also seeks to improve the emissions of the vehicle fleet, whereby, the LES compliments transport and travel planning. See figure 3.

Figure 3 – Emission Reduction Progression



2.3 Many local authorities are producing LES as part of their AQAP, covering road transport emissions, while some are even widening the scope of their LES to cover non-transport related emissions. Table 1 shows the local authorities that have either implemented or are in the process of implementing a LES.

2.3 AQAP should be prepared whenever an AQMA is designated, following Updating & Screening Assessments, Detailed and Further Assessments of local air quality. Often, by the time an AQAP is prepared, the evidence base on which the plan was produced is out of date. AQAP are required in a prescribed format that should detail every measure that may improve NO2 levels, including a quantification of cost and concentration improvement. As previously discussed, air quality modelling is often not capable or sensitive enough to quantify the impact of suggested measures. AQAP are inherently long documents that can

lose focus on key areas for action, can be vague in evaluating the effectiveness of measures and are generally not easily understood by the public and key stakeholders.

Table 1 – Low Emission Strategies in the UK and their status

Local Authority	LES Status
York	Adopted October 2012
Oxford	Adopted May 2013
Bradford	Adopted November 2013 (update 2016)
West Midlands Authorities (Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, Wolverhampton, WMCA)	Consultation 2014, publication Summer 2016
West Yorkshire Authorities (Bradford, Calderdale, Kirklees, Leeds, Wakefield, WYCA, PHE)	Consultation 2015, publication Summer 2016
Greater Manchester Authorities (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Thameside, Trafford, Wigan, GMCA))	Consultation March 2016
Colchester	Adopted April 2016
Scotland	Consultation 2015, publication 2016
Northampton	Consultation May 2016
Southampton	Consultation Summer 2016
Slough	Consultation Summer 2016
Rotherham	Consultation Summer 2016
Warwick	LES Planning Guidance adopted 2014
Medway	Developing LES Planning Guidance
Chelmsford	Developing LES Planning Guidance
Kent Councils	Developing LES Planning Guidance

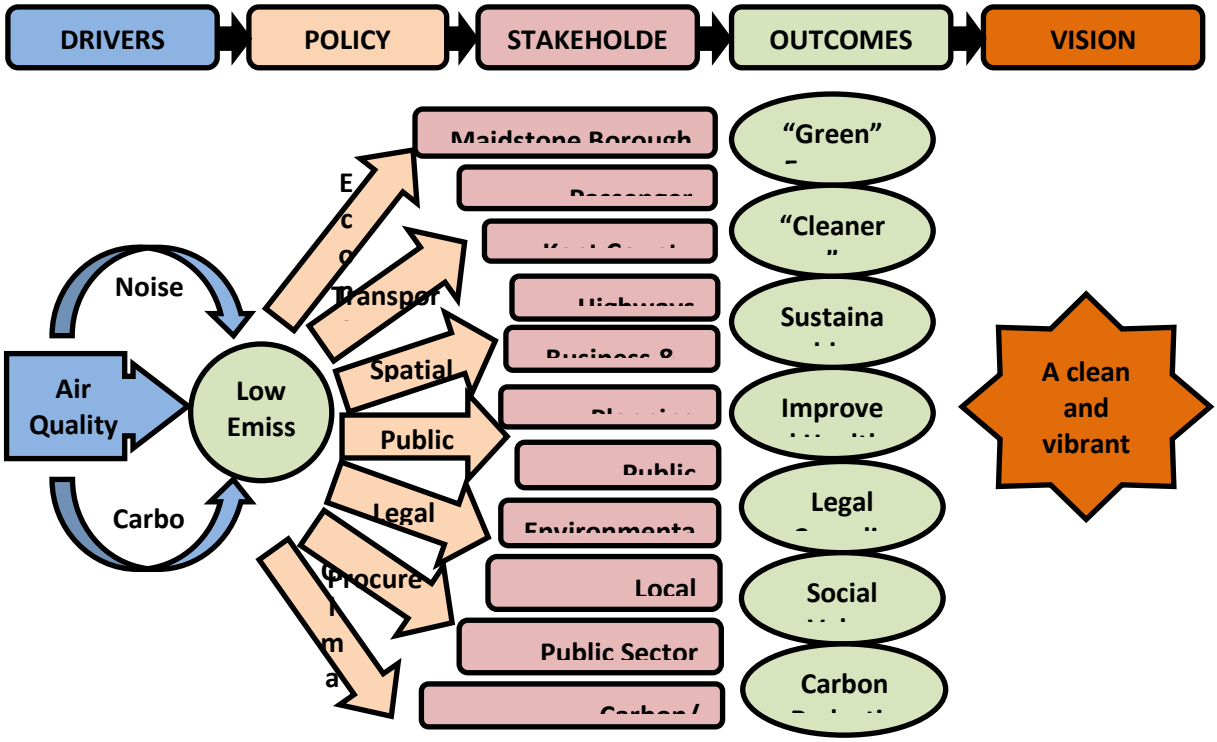
2.4 DEFRA has recognised that the local air quality management (LAQM) regime is overly bureaucratic and time-consuming, with an over-focus on continual assessment rather than on action planning[7]. A new regime is proposed that will require an annual Progress Report on activity to improve air quality. Therefore, is essential that an effective, clearly communicated plan is in place on which to report progress.

2.5 A LES is an overarching strategy with the aim of improving air quality by reducing vehicle emissions through the acceleration in the uptake of cleaner vehicles and technologies. The main objectives of the LES will be focussed on cost-effective measures to improve the emissions of key vehicle types, supported by wider policy initiatives, including

[7] https://consult.defra.gov.uk/communications/laqm_changes

land use planning and development control and public sector procurement. Through this integrated policy approach and effective engagement with key stakeholders it is envisaged that a wide range of outcomes can be achieved, including economic growth, where the LES provides a platform for inward investments as we move to a greener economy. See figure 4.

Figure 4 - Drivers, Policy Areas, Stakeholders & Outputs of a LES



A key facet of an LES is innovation. Many local authorities have started to recognise that the use of innovative concepts, such as damage costs, whole life costs (WLC) and total cost of ownership (TCO) can assist in communicating the objectives of a LES to the wider community.

3 Suggested Structure of a Low Emission Strategy

3.1 There is no prescribed format for a LES, however, as a rule of thumb, many authorities try to keep the LES concise and readable.

Outlined below is a suggested structure of a LES that has been used by several authorities:

Aims, Objectives

Clear aims and SMART objectives are provided, against which the delivery of the strategy can be measured

Evidence for Change

This section provides the information on why the LES is needed and may include:

- Air quality and emission data
- Health impacts of air pollution at a local and national level
- Legal compliance – legislative requirements

Creating a Low Emission Future

This section outlines policy measures that the public sector can introduce to support the uptake of cleaner vehicles and fuels and may include:

- Land-use planning and development control
- Public sector procurement, including local authority fleet management
- Licensing
- Travel planning

Low Emission Vehicle & Infrastructure Measures

This section outlines specific measures that may be introduced to tackle emissions from certain vehicle types and also the necessary infrastructure plans that will facilitate low and ultra-low emission vehicle uptake, including:

- Passenger cars
- Taxis
- Buses
- Freight vehicles
- Clean Air Zones (CAZ)
- Infrastructure

A delivery plan should accompany the LES detailing when the objectives will be met and by who, including funding requirements and opportunities.

4 Low Emission Strategy Measures & Implementation Mechanisms

This section looks at policies and measures that may form part of a LES, including mechanisms that can be used for implementation. Examples of best practice are provided.

4.1 Land-Use Planning and Development Control

The planning system in England has been reformed over recent years with the introduction of the National Planning Policy Framework (NPPF)[8]. The NPPF recognises air quality as a material consideration in the planning process and also introduces the presumption that planning approval will be granted for sustainable development. A LES should include guidance that seeks to define what is meant by 'sustainable' in air quality terms in order to provide consistency and clarity to both local authority practitioners and developers alike.

Several authorities have produced such guidance, including West Yorkshire (pictured), Sussex and West Midlands Authorities. Kent Authorities, including Medway, are currently looking at updating their planning guidance based on these examples.

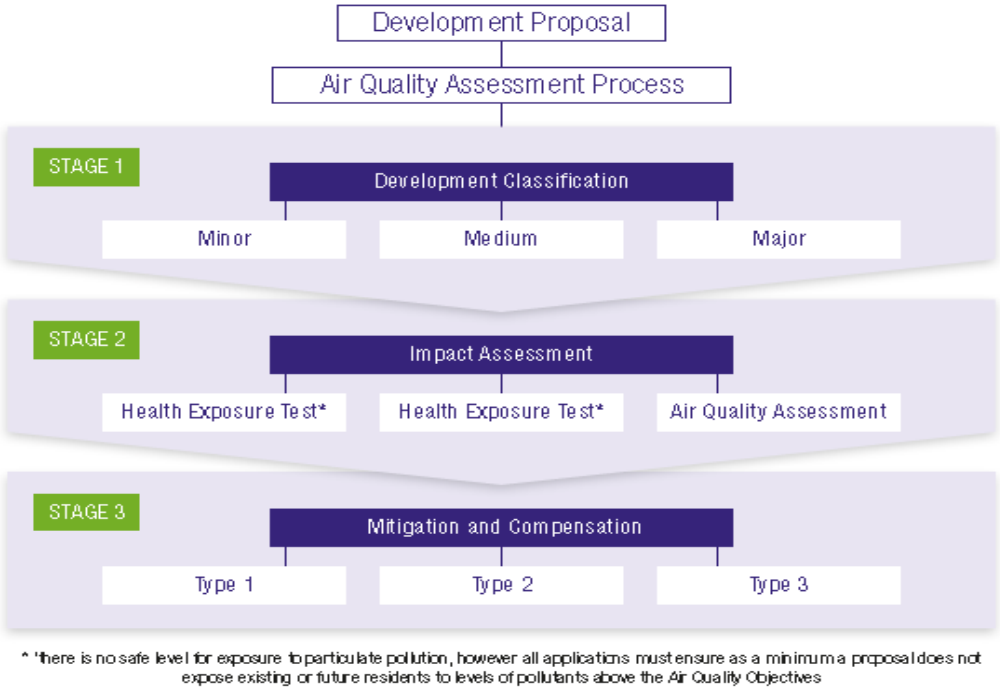
The NPPF recognises that air quality is a material consideration in the planning process and requires it to contribute to the achievement of EU Limit Values, recognising Air Quality Management Areas and Air Quality Action Plans. A key consideration in the NPPF is the cumulative effect of 'emissions creep' – LES guidance seeks to simplify assessment and mitigation procedures through a standardised development scheme classification according to potential impact, whilst recommending the types of appropriate and reasonable mitigation measures that should be designed into each scheme classification. A summary of this approach is shown in figure 5.

By incorporating mitigation measures into scheme design as standard, it is envisaged that this approach will help counteract the incremental emissions creep, inherent with most development schemes. LES guidance provides advice where exposure is likely to be an issue and possible ways in which this may be mitigated.

A key theme of the NPPF is that developments should enable future occupiers to make green vehicle choices and it explicitly states that low emission vehicle infrastructure, including electric vehicle (EV) re-charging, should be provided. LES guidance should provide consistent EV re-charging standards for new developments as Type 1 mitigation.

[8] https://www.gov.uk/government/publications/national-planning-policy-framework--2

Figure 5 - Development Classification & Mitigation



For medium and major developments, Type 2 mitigation should be incorporated into scheme design where appropriate, in addition to Type 1. Type 2 mitigation includes commercial fleet emission standards and use of ultra low emission service vehicles.

For development schemes that have the potential for major detrimental impact on air quality, the LES guidance should specify an assessment procedure to evaluate the likely change in relevant concentrations and emissions arising from the scheme. As part of the assessment procedure a simple calculation is required to allow the quantification of any emission changes – the pollution impact of a scheme can then be monetised using the pollutant damage costs (per tonne) specified by DEFRA Inter-Governmental Department on Costs and Benefits (IGCB)[9]. The damage costs allow the assessment of any additional mitigation or compensation that is required to make the scheme acceptable. A suite of mitigation/compensation measures termed Type 3 mitigation should be provided in the guidance and be consistent with measures in the LES.

National Planning Practice Guidance (NPPG)[10] states that air quality mitigation may include "contributing funding to measures, including those identified in air quality action plans and *low emission strategies*, designed to offset the impact on air quality arising from new development."

[9] http://www.defra.gov.uk/environment/quality/air/air-quality/economic/damage/
[10] http://planningguidance.communities.gov.uk/blog/guidance/air-quality/

4.2 Public Sector Procurement

LES should outline innovative procurement practices that can be adopted by public sector organisations to promote the uptake of cleaner vehicles and fuels. Public sector procurement is worth 2 trillion Euros across the EU Member States and accounts for 17% of GDP[11]. The LES should recognise this significant spending power and the potential influence it can have on transforming vehicle emissions, including:

- Local Sourcing initiatives and their ability to reduce road transport movements
- Integration of environmental performance criteria within public sector supply contracts (see figure 7) in line with the requirements of the *Public Services (Social Value) Act 2012*[12]
- Building on low emission vehicle demonstration activity within the region to inform business cases for accelerated deployment
- Legislative requirements for clean and fuel efficient procurement, including the consideration of Whole Life Costs and regional and national buying standards for transport[13] when procuring council vehicles

- Low emission vehicle and infrastructure cost reduction through joint procurement initiatives/public private partnerships, assisted by economies of scale
- Stimulating regional economic development and supporting the activity of the Local Enterprise Partnership

Low emission vehicle technology, as with most green products, is often more expensive to purchase than conventional vehicles but uses less energy over its life-time, meaning that their *whole life costs* are less than those of standard technology. This approach is supported by the EU Clean Vehicle Directive[14]**.** The EU Directive is enacted in England through the

[11] http://ec.europa.eu/environment/gpp/index_en.htm

[12] http://www.legislation.gov.uk/ukpga/2012/3/enacted

[13] http://sd.defra.gov.uk/advice/public/buying/products/transport/standards/

[14] http://ec.europa.eu/transport/urban/vehicles/directive/directive_en.htm

Cleaner Road Transport Vehicles Regulations 2011[15]. The Regulations state that any public sector contracting authority, entity or operator when purchasing or leasing road transport vehicles must take into account the operational lifetime energy and environmental impacts, in respect of vehicles purchased or leased.

The LES should seek to develop and adopt policies and targets for the cleaning of public fleets. In addition to vehicles purchased, the public sector can play a major role in cleaning commercial fleets through the consideration of vehicle emissions as part of procurement exercises. Figure 6 provides an example of how vehicle emissions may be considered in tender evaluations, with the weighting attached to the criteria dependant on the nature of the contract to be awarded.

Figure 6 - Tender evaluation criteria

SCORE	SCORE STANDARDS	
5	Excellent answer	Can evidence vehicle emission reduction activity, considering NOx, NO2, PM & CO2, and, using reasonable endeavours, will use vehicles (including NRMM) that comply with the latest European Emission Standard (Euro Standard) and include some vehicles that are classified as low or ultra low emission vehicles to deliver the contract
4	Good answer	Can evidence vehicle emission reduction activity, considering NOx, NO2, PM & CO2, and, using reasonable endeavours, will use vehicles (including NRMM) that comply with the latest Euro Standard to deliver the contract
3	Acceptable answer	Can evidence vehicle emission reduction activity, considering NOx, NO2, PM & CO2, and, using reasonable endeavours, will use a mix of vehicles (including NRMM), some that comply with the latest Euro Standard with the remainder complying with the previous Euro Standard, to deliver the contract
2	Poor answer	Can provide a commitment to vehicle emission standards for NOx, NO2, PM & CO2 (including NRMM) but may fall below the current or previous Euro Standard to deliver the contract
1	Very poor answer	Information may be provided but cannot commit to a reasonable vehicle emission standard to deliver the contract
0	No answer given	No information provided

4.3 Licensing

Most taxis, including Hackney Carriages (HC) and private hire vehicles (PHV), by the nature of their work, operate in the urban areas and often leave their engines running while waiting at taxi ranks. The majority of taxis are diesel vehicles. Local authorities set licensing standards for taxis, however, few include standards for emissions. Figure 7 illustrates

[15] http://www.legislation.gov.uk/uksi/2011/1631/made

emission standards for taxis that comply with the emerging national Clean Air Zone (CAZ) Framework.

It is recognised that taxi operations may be suitable for the use of ultra-low emission vehicles (ULEV)[16] which can often provide financial benefits for drivers, through lower purchasing[17] and running costs. Additionally, taxis provide an ideal opportunity for customers to gain an experience of riding in a plug-in vehicle, increasing the chances of considering such purchasing such vehicles. Targeted policies can be developed as part of the LES. This may include the following measures:

- ULEV/CAZ standard for taxis
- ULEV/CAZ taxi recognition scheme
- ULEV/CAZ compliant only taxi ranks
- Increased provision of dedicated fast and rapid charging facilities for taxis
- ULEV/CAZ requirements for public sector contracts

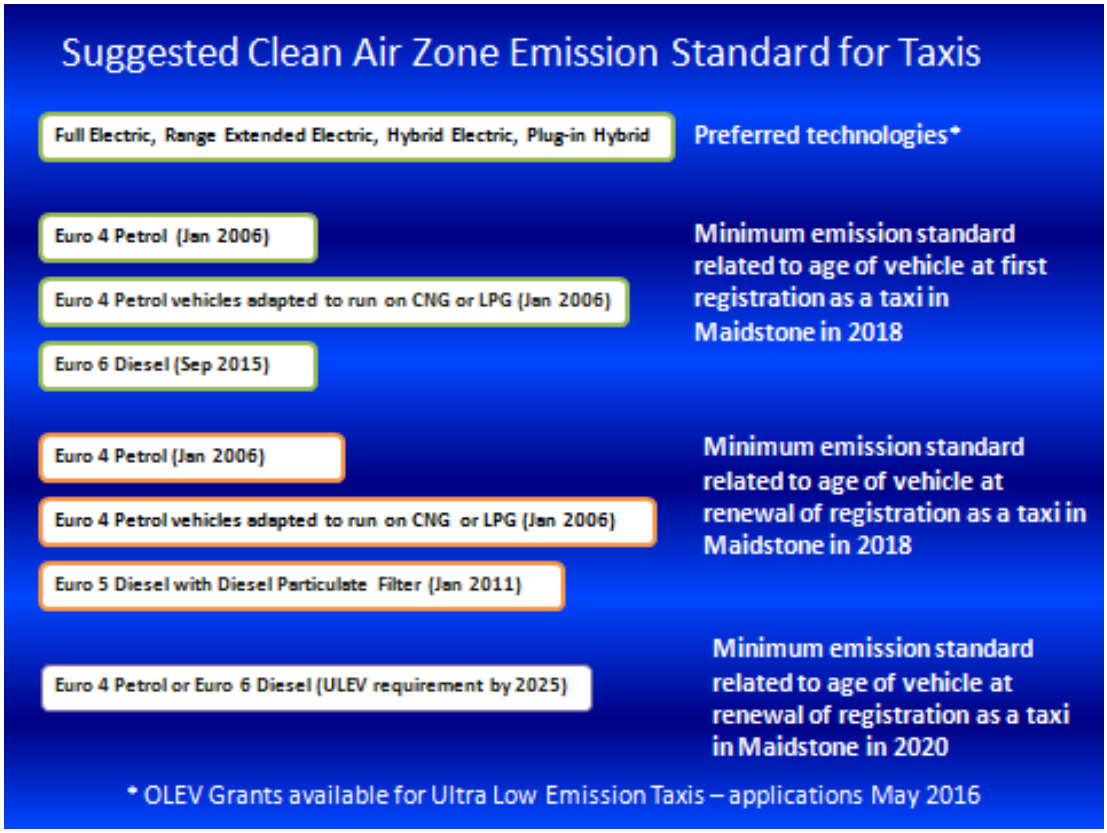


Figure 7 - CAZ standards for taxis

[16] Vehicle emitting less than 75 g/km CO2

[17] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/426908/_20-million-ulev-taxi-scheme-guidance-for-participants.pdf

4.4 Travel Planning

Many public and private sector organisations have developed travel plans to promote alternatives to vehicle use, such as measures that seek to increase walking and cycling and the benefits of active travel. Whether aimed at schools, workplaces or residential developments, such travel plans can play an important role in reducing vehicle emissions, particularly when they are effectively monitored. However, it is recognised that travel planning can also include measures to improve the emissions of vehicles as well. These measures may include:

- Preferential parking spaces and rates for ultra-low emission vehicles
- Charging infrastructure to support plug-in car use
- Provision of ultra-low emission pool cars
- Inclusion of ultra-low emission vehicles in 'salary sacrifice' programmes
- Car allowance rates to incentivise ultra-low emission vehicle use

4.5 Vehicle Specific Measures

The following sections discuss some of the vehicle specific LES measures that local authorities have adopted. While it isn't possible to provide a comprehensive account of all the measures that may be considered within this briefing note, the information provides some examples that may be considered within a Maidstone LES.

Table 2 - Source apportionment for NOx Emissions within the Exceedence Areas

Area	Average emission factor, g/veh-km	Speed kph	All LDV (%)	All HDV (%)	Petrol Cars (%)	Diesel Cars (%)	Petrol LGV (%)	Diesel LGV (%)	Rigid HGV (%)	Artic HGV (%)	Buses/ Coaches (%)	Motorcycles (%)
High Street	6.60	11	6%	94%	1%	3%	0%	2%	1%	0%	93%	0%
Fairmeadow AQ	0.49	50	71%	29%	21%	32%	1%	17%	11%	10%	9%	0%
Upper Stone Street	0.81	30	49%	51%	14%	24%	0%	11%	21%	13%	16%	0%
Tonbridge Road	0.92	11	61%	39%	15%	32%	0%	15%	18%	5%	16%	0%
The Wheatsheaf	1.18	11	47%	53%	11%	24%	0%	12%	19%	12%	22%	0%
Well Road	0.92	11	63%	37%	14%	31%	0%	17%	13%	5%	20%	0%
Forstal Road	0.83	60	35%	65%	11%	16%	0%	6%	45%	15%	5%	0%

In determining which vehicle types should be included for consideration within a LES it is necessary to look at the relative emission contribution made by each type at key locations. This information will allow targeted, vehicle specific action. Table 2 shows the percentage of transport emissions of NOx broken down by vehicle type at key locations within areas that exceed the EU Limit Value for NO_2 in Maidstone.

4.6 Passenger Cars

One of the key reasons that air quality has not improved in line with expectations is the significant increase in diesel car use in the UK. In 2000, around 20% of cars sold were diesel compared with around 60% today[18]. Diesel cars have been promoted as environmentally friendly with generally lower vehicle excise duty (VED)[19]. Further action is needed by Government to look at the incentives provided for diesel cars and their suitability for use in urban areas needs to be questioned.

The LES should seek to raise awareness about the relative emissions of cars, the impact of their emissions on health and also the total cost of ownership (TCO) of standard technologies compared with alternative fuelled models. The TCO of cars can help the public make informed purchasing decisions. For example, while the purchasing cost of an electric or hybrid vehicle is generally more than a conventional diesel car, the total cost, including tax, fuel costs and depreciation is often less than the diesel. Table 3 illustrates the TCO for selected car models.

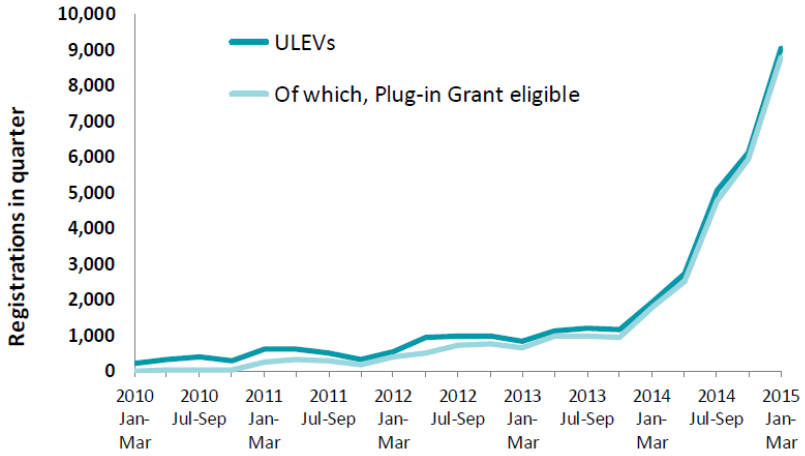
Table 3 - TCO of selected car models

Vehicle	Leaf (hatchback)	Octavia (hatchback)	Octavia (hatchback)	Prius (hatchback)
Manufacturer	Nissan	Skoda	Skoda	Toyota
Model details	80kw Visia 5dr	1.4TSI 140 SE 5dr	1.6TDI 105 S 5dr	1.8 VVT-I T3 5dr
Fuel type	Electric	Petrol injection	Diesel turbo	Petrol hybrid
Power (kw)	80	102.12	76.96	99.16
0-60mph (sec)	11.5	8.4	10.8	10.4
Euro std	NA	6	6	6
Price	£ 21,490	£ 18,860	£ 18,360	£ 21,995
3yr RV	£ 7,820	£ 7,075	£ 8,185	£ 12,665
New/used	New	New	New	New
Miles pa	25,000	25,000	25,000	25,000
mpg	NA	35	47	52.2
litres/km (kwh/km)	0.173	0.081	0.060	0.054
Tax band	A	D	A	A
Depreciation 3yrs	£ 13,670	£ 11,785	£ 10,175	£ 9,330
Tax £pa	£ -	£ 110	£ -	£ -
Fuel £pa	£ 519.00	£ 3,959	£ 3,054	£ 2,654
Servicing £pa	0	£ 185	£ 179	£ 202
Nox damage £/yr	0	£ 11.06	£ 80.93	£ 7.41
PM damage £/yr	0	£ 17.54	£ 17.54	£ 17.54
CO2 damage £/yr	£ 144.94	£ 308.95	£ 268.16	£ 207.15
TCO for 1 yr (no depr)	**£ 664**	**£ 4,591**	**£ 3,599**	**£ 3,089**
TCO for 3 yrs inc depr	**£ 15,661.82**	**£ 25,558.99**	**£ 20,973.21**	**£ 18,596.38**

[18] www.smmt.co.uk
[19] https://www.gov.uk/government/publications/vehicle-excise-duty

The Government has pledged that almost all new car and light goods vehicle sales will be zero emission by 2050 [20] and will continue to provide a grant of up to £4,500 towards the purchase of ultra low emission cars[21], including plug-in vehicles[22]. Take-up of ULEVs continues to grow (see figure 8) while costs are reducing and the number of plug-in model available is increasing[23]. The LES should promote Government funding schemes to support ULEV take-up including grants to support charging infrastructure[24].

Figure 8 – Ultra Low Emission & Electric Vehicles: UK 2010 – Q1 2015[25]



Measures to support ULEVs may include:

- Publicise potential benefits through LES, including available funding
- Charging points on new developments where practical
- Provision of charging points in town centre car parks and key destination points, including differential parking rates
- Promote public sector take-up through salary sacrifice schemes, preferential parking spaces, differential car allowance rates and public sector fleet procurement – demonstrating leadership
- Promote incentives for community take-up, including charging provision through travel plans and resident groups
- Liaise with vehicle manufacturers & suppliers, infrastructure providers and ancillary support businesses to secure commercial benefits and economic growth
- Develop licensing requirements for ULEV taxis
- Raise awareness of charging network access

[20] https://www.gov.uk/government/news/uk-government-pledges-bold-ambition-for-electric-cars
[21] Vehicle that emits less than 75g/km of CO2
[22] https://www.gov.uk/plug-in-car-van-grants
[23] https://www.goultralow.com/
[24] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515932/electric-vehicle-homecharge-scheme-guidance-for-customers-2015.pdf
[25] Vehicle Licensing Statistics: Quarter 1 (Jan – Mar) 2015, DfT (June 2015)

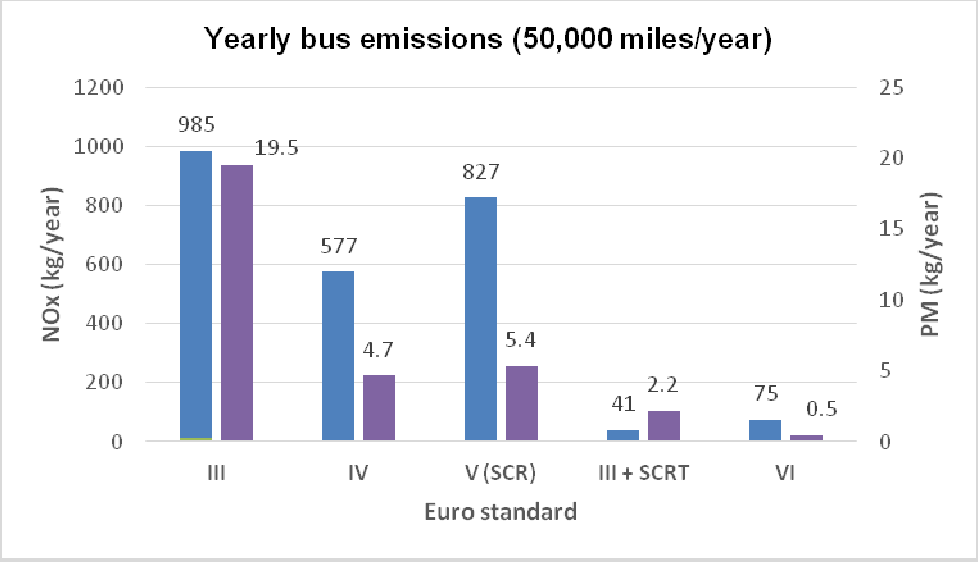
4.7 Buses

93% of all transport emissions of NOx on the High Street are caused by buses. Figure 9 illustrates the emission standard of significant bus fleets in Maidstone in 2014. Figure 10 shows the relative emissions of buses in line with their Euro Standard.

Figure 9 - Maidstone bus fleet Euro Standards

	Euro I	Euro II	Euro III	Euro IV	Euro V	Euro V hybrid	Euro VI	Euro II retrofit to Euro IV	Euro III retrofit to Euro IV	Euro III retrofit to Euro V
Nu-venture 2012 fleet	21	29	9	0	0	0	0	0	0	0
Arriva 2011 fleet	6	26	29	5	7	0	0	0	0	0
Arriva 2014 fleet	0	11	28	0	15	11	0	4	2	0
Arriva 2014 fleet retrofit	0	11	18	0	15	11	0	4	2	10

Figure 10 – Bus emissions per year per Euro Standard (blue = NOx)

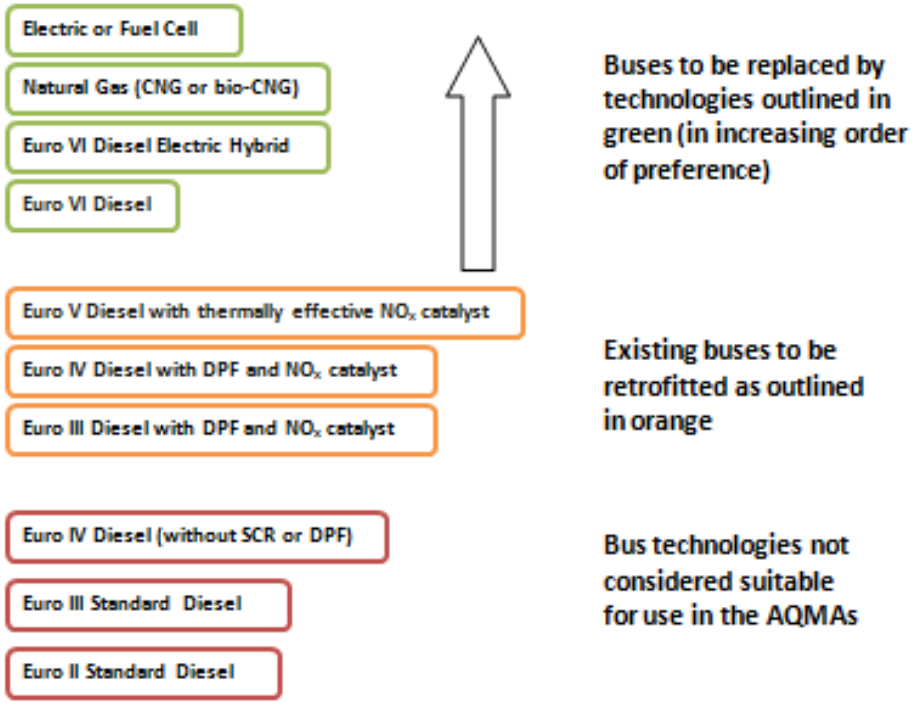


Local authorities now recognise that bus companies will seek to operate a bus for about 15 years (after which they often become school buses) and that buses are cascaded both country and county wide. Bus operators may seek to move newer buses to areas where there are emission standards while retaining older buses in areas without standards. Emission Standards for buses can be implemented in several ways with the support of the Highway Authority:

- Quality Bus Partnership (Transport Act 2008)
- Traffic Control Order (TCO) through the Traffic Commissioner
- Road Traffic Regulation Order (RTRO) through the Highways Authority
- Quality Contracts
- Clean Air Zones (CAZ) are likely to be implemented through the above mechanisms

A suggested bus emission standard for Maidstone is illustrated in figure 11.

Figure 11 - Suggested bus emission standard



4.8 Clean Air Zones

DEFRA plans to improve air quality include proposals to mandate Clean Air Zones (CAZ) in several cities outside London, including Birmingham, Derby, Leeds, Nottingham and Southampton by 2020 or sooner. These cities will be required to charge non-compliant vehicles to enter the CAZ. The plans also include proposals to promote 'voluntary' CAZ in other towns and cities, whereby charging isn't compulsory.

DEFRA are in the process of developing a National Clean Air Zone Framework and any local authority may consider implementing a CAZ where air quality, caused by road transport emissions, is an issue. It is envisaged that 'voluntary' CAZ will retain more flexibility than mandated CAZ in the types of vehicles included and the emission standards they are required to meet. Additionally, the CAZ framework may be used to include wider measures to support the uptake of ultra-low emission vehicles.

For example, Maidstone may consider introducing a CAZ on the High Street for buses. The implementation mechanisms listed in section 4.7 would be used to introduce the CAZ.

4.9 Freight Vehicles

The performance of heavy duty vehicles, including lorries and buses, compared with their Euro Standards (see figure 12), shows that the current Euro VI Standard is performing well under real world driving, particularly when vehicles are laden (see figure 13).

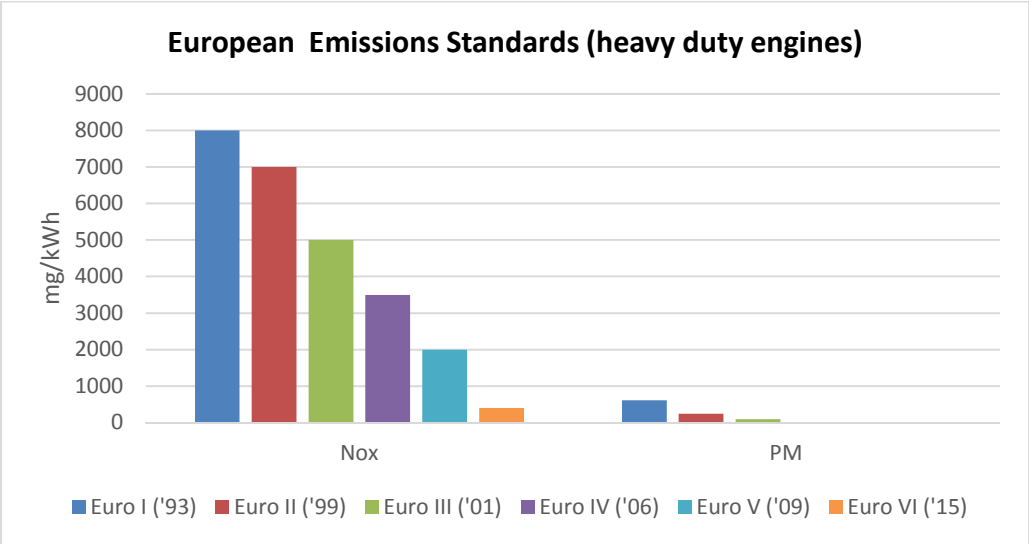


Figure 12 - Euro Standards for Heavy Duty Vehicles

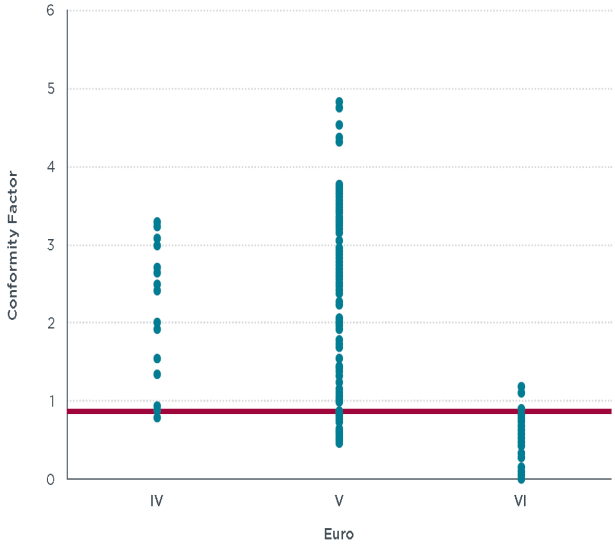


Figure 13 - Euro Standard conformity tests (ICCT, 2015)

Unlike buses, lorries tend to turnover more rapidly due to the high annual mileage they complete, and the Freight Transport Association (FTA) states that its members will all achieve Euro VI by 2020. The Road Haulage Association (RHA), whose members tend to have older vehicles, believe this transformation will take longer. Therefore, the focus of the LES

will be to encourage the turnover of the HGV fleet to a Euro VI Standard and also promote alternative refuelling infrastructure for natural gas / biomethane, which is both low in NOx and CO2 emissions.

The LES should highlights strategic measures which could be introduced to help reduce road freight transport emissions and facilitate a transition to low emission fuels and technologies. These include:

- Sustainable emission criteria in public sector purchasing decisions
- Emission standards for commercial fleet operations associated with new development schemes
- Promotion of fleet emission recognition schemes such as Eco Stars[26]
- Promotion of freight consolidation / sustainable delivery centres
- Alternative refuelling infrastructure such as natural gas, biomethane, gas to liquids (GTL) and hydrogen. (Information, including locations of gas refuelling nationally can be found on the Gas Vehicle Hub – www.gasvehicle.hub.org)
- Consideration of Delivery Service Plans with possibilities of scheduling deliveries outside of peak times
- Consideration of 'last mile' deliveries using low and ultra low emission vehicles.

5 Delivery Plan

5.1 A LES should have a detailed plan for delivering the objectives of the strategy. The delivery plan should include the following information:

- Details of the objectives and measures to be delivered, including key stakeholders
- Details of the organisation/department responsible for delivery
- Timescales for delivery
- Funding mechanisms required for delivering measures
- National funding opportunities to be pursued that will assist in implementing measures
- Opportunities for levering inward investment, including partnership opportunities with the private sector
- Key aspects of any communication/engagement strategy required to promote the LES measures
- Details of any review and monitoring mechanisms required to assess successful implementation of the LES

[26] http://www.ecostars-uk.com/