

Slough Low Emission Strategy (LES) 2018 – 2025 Technical Report

The LES forms part of the Slough Air Quality Action Plan (AQAP) in line with the requirements of Part IV of the Environment Act 1995



September 2018

About the Low Emission Strategy (LES)

The Slough Low Emission Strategy (LES) forms part of the Slough Air Quality Action Plan. The LES lays out an integrated, year on year plan to improve air quality over the period until 2025 through a reduction in vehicle emissions by accelerating the uptake of cleaner fuels and technologies.

The LES development has been part funded through the DEFRA Air Quality Grant Programme.

The LES project is managed by Jason Newman, Environmental Quality Manager, Slough Borough Council (SBC), with additional support provided by SBC Officers, representing:

- * Transport Policy & Management
- * Public Health
- * Planning Policy & Development Management
- * Environmental Strategy and Governance, including Fleet Management
- * Procurement Policy
- * Taxi Licensing
- * Carbon Management & Sustainability

The LES has been produced with technical support from Andrew Whittles, Low Emission Strategies Ltd.

SBC carried out extensive consultation on the draft LES from the 24th November 2017 to the 5th February 2018. The feedback from the consultation exercise has been incorporated into the final LES. A summary of LES consultation responses has been published on the SBC Low Emission Strategy webpage - <http://www.slough.gov.uk/pests-pollution-and-food-hygiene/low-emission-strategy-2018-2025.aspx>

This document forms the Low Emission Strategy Technical Report and a Summary LES has also been published.

Foreword

Like many areas of the UK, Slough experiences elevated levels of air pollution which have a marked impact on the health of its residents. While several factors contribute to the borough's air quality, the emissions from road transport vehicles are the most significant source.



The Council's Low Emission Strategy supports our new transport strategy and forms part of the Slough Air Quality Action Plan (AQAP). It lays out an integrated, year on year plan to improve air quality up to 2025, reducing vehicle emissions by accelerating the uptake of cleaner fuels and technologies.

Reducing air pollution from road transport through a Low Emission Strategy is a Slough Labour Party manifesto pledge and improving the borough's air quality is a key commitment in the council's Five-Year Plan (2018-2023).

The Low Emission Strategy targets reductions in vehicle emissions across the borough which will improve air quality and health outcomes. The health and wellbeing of our residents and the people who visit and work in Slough is paramount and we can make great improvements to our local air quality if we work together towards a shared vision.

We are committed to making immediate and long-lasting improvements to our environment and we'd like residents and businesses to help us deliver our plans to create a low emissions future for Slough.

Councillor Robert Anderson

Cabinet Member for Environment and Leisure

Executive Summary

Slough, like many urban areas in the UK, experiences elevated levels of air pollution which have a measurable impact on the health of the local population. While there are several factors contributing to our local air quality, including heating and energy production and the cross-boundary transportation of pollution, the emissions from road transport vehicles are the most significant source.

Slough Borough Council (SBC) has designated 5 Air Quality Management Areas (AQMA) due to elevated levels of nitrogen dioxide (NO₂) which breach the National Air Quality Objective (AQO) /EU Limit Value (annual mean NO₂) and where there is relevant exposure of residents. The AQMA are located around the M4, Tuns lane, Bath Road, Town Centre/A4 and Brands Hill/A4 and cover nearly 2,000 residential properties. Slough has an extensive air quality monitoring network that has shown small improvements in air quality in most areas while some areas have either remained stubbornly elevated or deteriorated slightly. Levels in Langley are currently just below the AQO but may require the designation of a new AQMA in the future.

While levels of particulate matter (PM) do not exceed EU Limit Values, the Joint Strategic Needs Assessment (JSNA) shows that levels of fine particulates (PM_{2.5}) in 2015 accounted for 19.1 premature deaths per 100,000 people in Slough compared with a rate of 11.7 for the South East. The health impacts of air pollution are becoming more apparent with evidence showing effects such as heart attacks, strokes, low birth weight babies and impaired lung and brain development. The World Health Organisation (WHO) categorises diesel exhaust fumes as carcinogenic.

The *SBC Five Year Plan* and *Wellbeing Strategy* commit us to improving health outcomes in the Borough and we have developed a *Low Emission Strategy (LES)* which will support the new *Transport Strategy* in targeting reductions in vehicle emissions by accelerating the uptake of cleaner vehicles and technologies, that are capable of improving air quality and health and also contribute to sustainable growth as part of the transition to a low emission economy.

The LES development has been supported by Government funding and includes practical policies and measures that are in line with best practice and Government policies. The Government has published the 'UK plans for tackling roadside NO₂ concentrations' in 2017. The plans include a national *Clean Air Zone (CAZ) Framework*. The LES is also in line with the Government's *Road to Zero Strategy*, a key element of the national Industrial Strategy.

The LES comprises sections outlining the reasons why we are taking action (*Evidence for Change*), the measures that we can take as a Council to reduce vehicle emissions and improve air quality and health (*Creating a Low Emission Future: Leading by Example*), a *Clean Air Zone (CAZ) Framework for Slough* that we can deliver in partnership with key stakeholders to improve the emissions of buses and freight vehicles, while encouraging the take-up of ultra-low emission vehicles (ULEV) through a Slough Electric Vehicle Plan. A *Delivery Plan* will detail how we can communicate key messages through our Public Health

team, set roles, responsibilities and timescales for delivery while monitoring implementation and updating the strategy when necessary.

The LES builds on significant activity in the Borough in demonstrating leadership in *Creating a Low Emission Future*:

- SBC has developed extensive cycling infrastructure in the Borough, including cycle hire facilities;
- SBC has successfully introduced electric vehicle charge points in the town centre that show a continual upward trend in use;
- SBC has successfully introduced charge points at its Council Offices to allow our EV fleet, Staff EVs and visitor EVs to use;
- SBC has introduced electric pool cars and e-bikes as part of the Slough Fleet Challenge to reduce 'grey' vehicle emissions and costs;
- Slough has the fourth largest number of plug-in vehicles registered in the UK per local authority with over 5000;
- SBC Environmental Services Fleet meets the latest European (Euro VI) Emission Standard with plans to look at alternative fuels to diesel as part of the next fleet replacement cycle (2024). The SBC appraisal of alternative fuels and technologies using whole life costs (WLC) has been published as best practice by the Local Government Association (LGA);
- SBC is reviewing van and light commercial vehicle operations with a view to procuring the cleanest (Euro 6/VI) vehicles while transitioning to ULEVs where feasible;
- SBC has adopted new emission standards for taxis and private hire vehicles (PHV), including both CAZ standards and future ultra-low emission vehicle (ULEV) standards;
- SBC has secured £157,000 in Government funding to develop a dedicated, rapid charging network to support high growth in plug-in taxis and PHVs;
- SBC will support the cleanest emission standards for vehicles through Social Value procurement criteria and relevant contracts;
- SBC will introduce Air Quality Planning Guidance in line with national planning policy and guidance to support the Local Plan, requiring mitigation to be integrated into the design stage of new developments;
- Electric charge points will be required on all new developments with new parking provision.

As part of the *Slough Clean Air Zone (CAZ) Framework* we will:

- raise awareness of vehicle emissions and their impact on air quality and health
- look at the feasibility of introducing a CAZ in Slough which could potentially set emission standards for taxis, buses, coaches, lorries and vans

- develop a low emissions pathway to 2025 in partnership with local bus operators
- promote the development of alternative refueling infrastructure for buses and freight vehicles
- provide co-ordination in supporting the uptake of ULEVs and developing charging infrastructure to support growth through the *Slough Electric Vehicle Plan*

Central to the delivery of the LES will be the development and implementation of an effective *Communications Plan*, in partnership with Public Health, which will raise public awareness and support stakeholder engagement through key messaging about vehicle emissions and actions that can be taken to tackle the problems we face.

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Aims and Objectives

Aims

- Improve air quality and health outcomes across Slough by reducing vehicle emissions through the accelerated uptake of cleaner fuels and technologies
- Embed an innovative approach to vehicle emission reduction through integrated policy development and implementation
- Provide a platform for inward investment as part of the transition to a low emission economy

Objectives
1 General
1a Ensure all relevant Council strategies consider and support measures to improve air quality and health outcomes in partnership with stakeholders
2 Evidence for Change
2a Provide a robust framework for monitoring and modelling air quality across Slough
2b Use national and local data to assess the impact on health of Slough residents arising from air pollution
2c Work with local health professionals to promote awareness of the impact of vehicle emissions on health
3 Creating a Low Emission Future: Leading by Example
3a Provide measures to improve vehicle emissions through the Transport Strategy and Local Transport Plans
3b Provide policies to support improvements in air quality through the Local Plan
3c Develop air quality and planning guidance to promote air quality mitigation at design stage and support wider air quality improvements through off-set mitigation
3d Introduce specifications for electric vehicle charging as part of new development schemes
3e Implement vehicle emission standards through Social Value procurement practices
3f Consider whole life costs and alternatives to diesel in SBC vehicle fleet procurements
3g Introduce Clean Air Taxi emission standards and infrastructure to support the take-up of ultra-low emission taxis
3h Implement the Fleet Challenge to reduce emissions from the SBC 'grey fleet'
4 Slough Clean Air Zone (CAZ) Framework
4a Look at the feasible implementation of a Borough-wide Clean Air Zone (CAZ) including emission standards for buses, taxis, lorries and vans, in line with National Air Quality Plans
4b Implement measures to support the take-up of ultra-low emission vehicles (ULEV) through the development of a Slough Electric Vehicle Plan
4c Work in partnership with bus and freight operators to reduce emissions
4d Work in partnership with Highways England to reduce the impact of vehicles on the Strategic Road Network (M4)
4e Capitalise on Heathrow expansion to help us realise the potential benefits of this opportunity to improve air quality in Slough
4e Prepare a Low Emission Programme to deliver measures within the LES
5 Communication and Delivery Plan
5a Produce an integrated communications and delivery plan for measures in the LES

1 Introduction

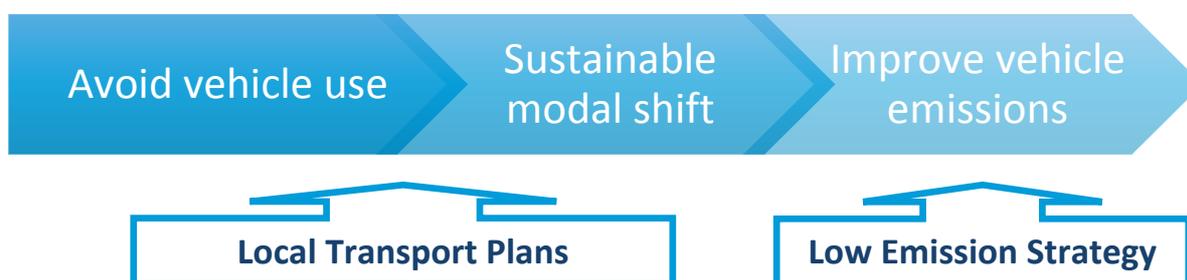
1.1 Like many urban areas Slough experiences elevated levels of air pollution that has a measurable health impact on the residents of the Borough. As industrial emissions have reduced they have been replaced with vehicle related pollution, exacerbated by the position of the Borough in the vicinity of the national strategic motorway network and international aviation hub - Heathrow Airport.

Slough Borough Council (SBC) Low Emission Strategy (LES) forms part of the Air Quality Action Plan (AQAP) and is designed to tackle road transport related pollution and improve health outcomes by implementing innovative policies and measures that seek to reduce vehicle emissions by helping to accelerate the uptake of cleaner fuels and technologies. It is believed that this approach will also secure win wins in reducing vehicle emissions of Carbon and noise. The LES has been produced with funding support from DEFRA¹ Air Quality Grant Programme. The LES supports and compliments key SBC Strategies.

1.2 Levels of nitrogen dioxide (NO₂) have remained stubbornly elevated over the last decade in some measured locations 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. Evidence has shown that many vehicles emit far more oxides of nitrogen (NO_x, a precursor for NO₂) in real-world driving than in tests by manufacturers.

Secondly, 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. The 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 1.

Figure 1 - Emission Reduction Progression



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

¹ Department for Environment, Food and Rural Affairs

² <https://www.gov.uk/government/publications/vehicle-excise-duty>

to 60% within the last 15 years³. We now know that even the newest diesel cars can emit significantly more NOx than petrol cars and in some cases certainly more than the manufacturer's tests claim.

Lastly, while transport and travel planning plays a major role in potentially improving air quality, local authorities can make use of wider policy areas, including land-use planning, procurement practices and licensing standards to support the accelerated take-up and use of low emission vehicles that also have the potential to provide an enhanced platform for inward investment. The LES provides an over-arching framework of vehicle emission reduction activity to be delivered through an integrated policy approach. Figure 2 illustrates this approach, highlighting the drivers, policy areas, key stakeholders and potential outcomes of the LES.

1.3 A key driver of the LES is improving public health. It is acknowledged that poor air quality affects deprived communities disproportionately and in line with the **Slough Wellbeing Strategy (2016-2020)** and **Slough 5 Year Plan (2018-2023)** the LES will seek to deliver outcomes that assist in:

- Protecting vulnerable children
- Increasing life expectancy by focusing on inequalities
- Improving mental health and wellbeing

1.4 The LES has been structured into 3 sections:

* *Evidence for Change* - which highlights the information gathered by Slough on air quality and vehicle emissions and the health impacts of air pollution. This section also looks at the legal obligations of local air quality management (LAQM).

* *Creating a Low Emission Future: Leading by Example* – this section looks at how SBC can use a variety of policy mechanisms to improve air quality and achieve good growth.

* *Slough Clean Air Zone (CAZ) Framework* – detailing specific vehicle measures to both discourage the most polluting vehicles while encouraging the uptake of cleaner vehicle technologies and fuels.

A *Low Emission Programme* and detailed *delivery plan* will be developed to allocate roles, responsibilities and timescales for implementing key LES measures. The structure of the LES is illustrated in figure 3.

1.5 The Slough LES is one of the first emerging strategies of its kind in the UK and has been developed in parallel with other local authorities. DEFRA's Plans to Improve Air Quality⁴ recognise the approach taken by Slough and others and states, "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."

³ www.smmmt.co.uk

⁴ <https://www.gov.uk/government/publications/air-quality-in-the-uk-plan-to-reduce-nitrogen-dioxide-emissions>

Figure 2 - Low Emission Strategy Drivers, Policy Areas, Stakeholders & Outcomes

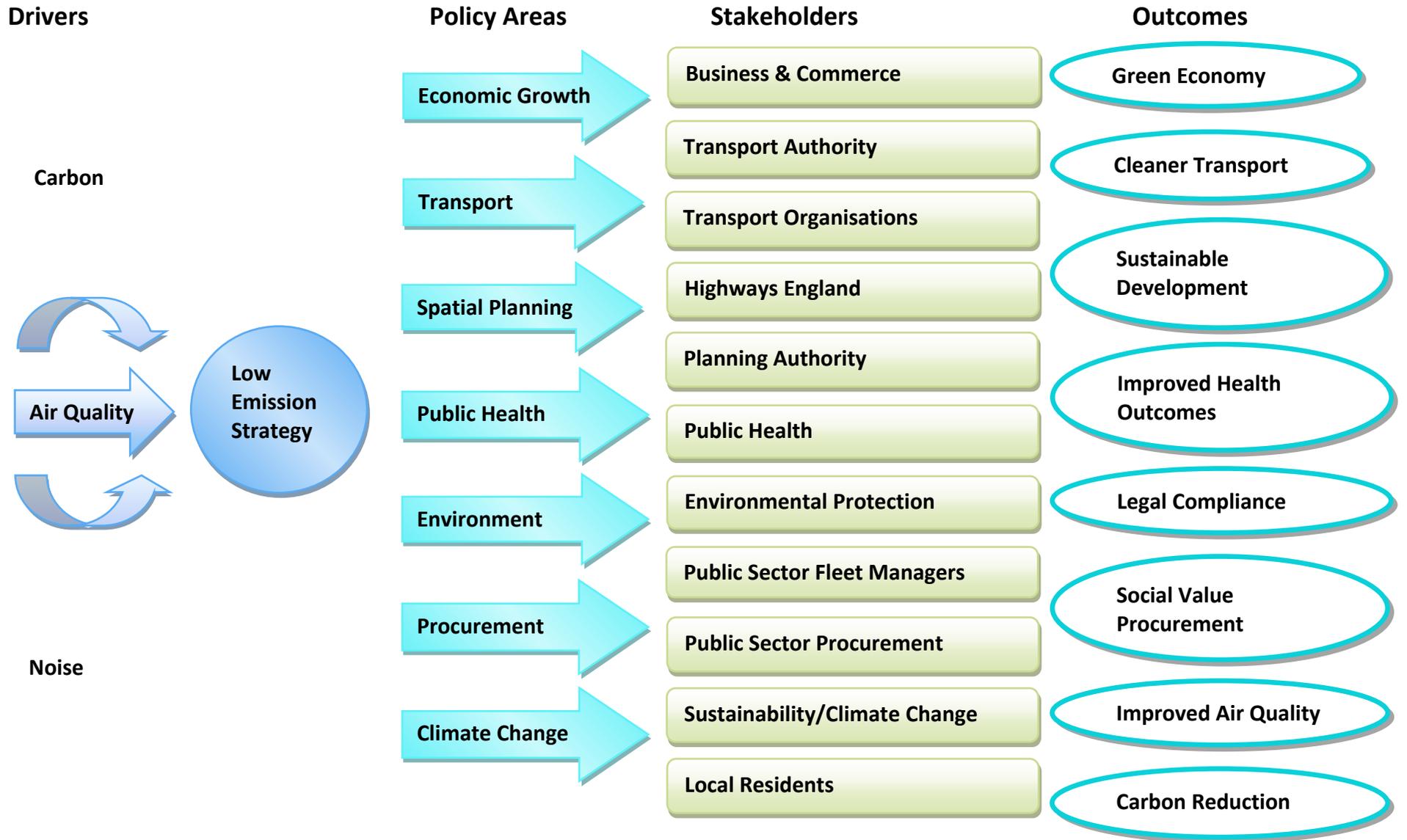


Figure 3 - Low Emission Strategy Structure



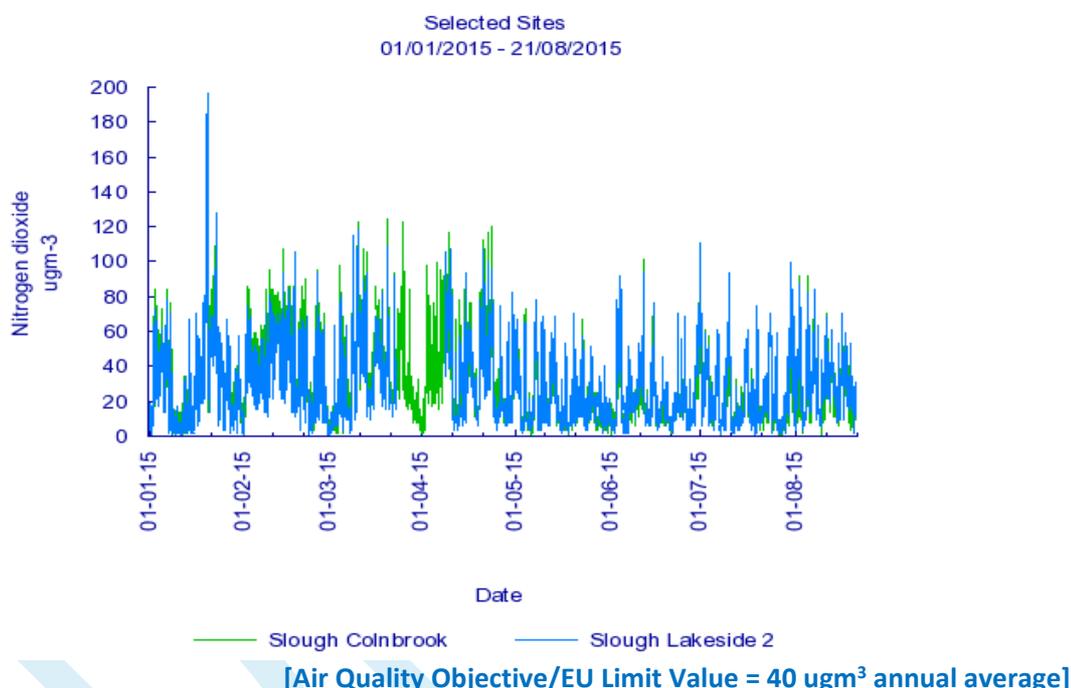
2 EVIDENCE FOR CHANGE

2.1 AIR QUALITY AND VEHICLE EMISSIONS

Nitrogen Dioxide (NO₂)

SBC has an extensive air quality monitoring network of automatic monitoring stations (looking at NO₂ and particulate matter) and diffusion tubes (monitoring NO₂). Full details of the monitoring results can be found on the SBC website⁵.

Figure 4 – Example of automatic NO₂ monitoring results at Colnbrook and Lakeside



Levels of NO₂ in key locations in the borough where there is relevant exposure to the public have remained stubbornly elevated over the last decade and exceed the Government's Air Quality Objectives (AQO) and the European Union (EU) Limit Value⁶. SBC has designated these affected areas as Air Quality Management Areas (AQMA), including:

- Slough Town Centre
- M4 corridor
- Tuns Lane
- Bath Road
- Brands Hill

A map showing the locations of the AQMA can be seen in figure 5. The emissions from road transport vehicles are the most significant cause of elevated NO₂ levels in all the AQMA. Modelled concentrations of NO₂ in the AQMA in 2014 can be seen in figures 6, 7, 8 and 9.

⁵ <http://www.slough.gov.uk/pests-pollution-and-food-hygiene/air-quality-reports.aspx>

⁶ <https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits>

Figure 5 - Air Quality Management Areas (AQMA) in Slough

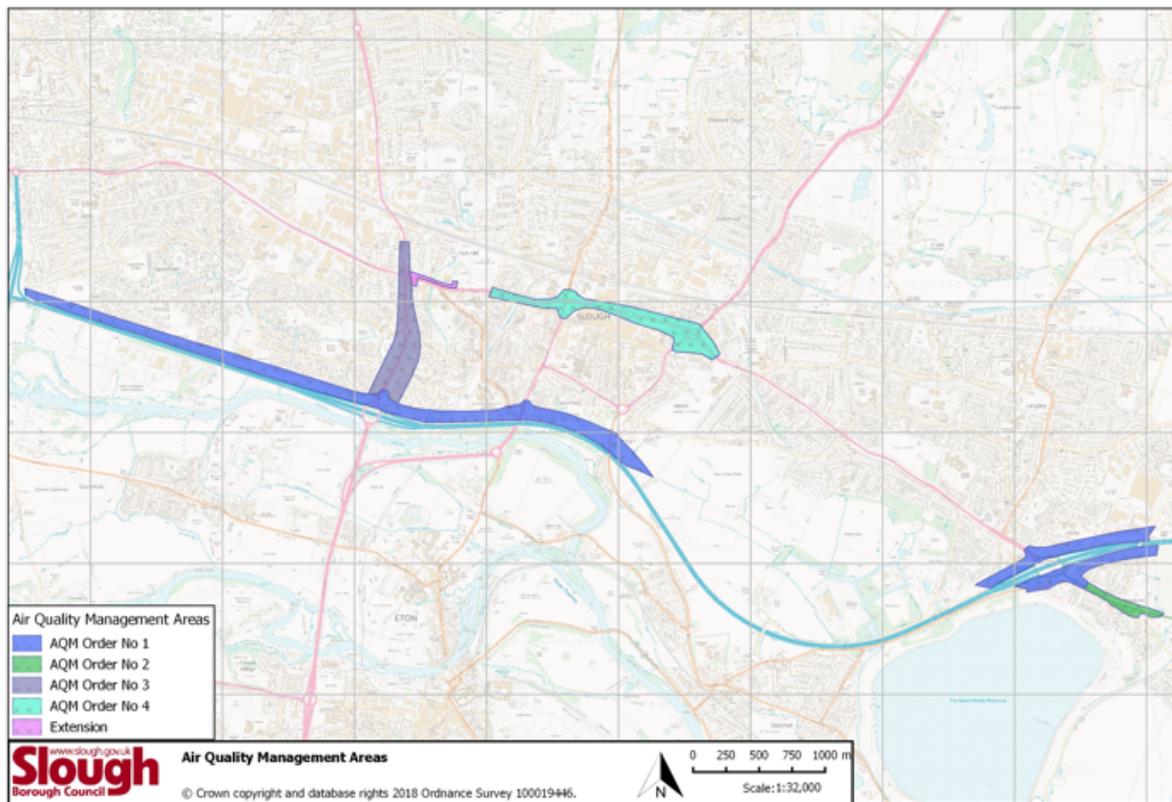


Figure 6 – Modelled NO₂ concentrations in the Town Centre AQMA (2014)

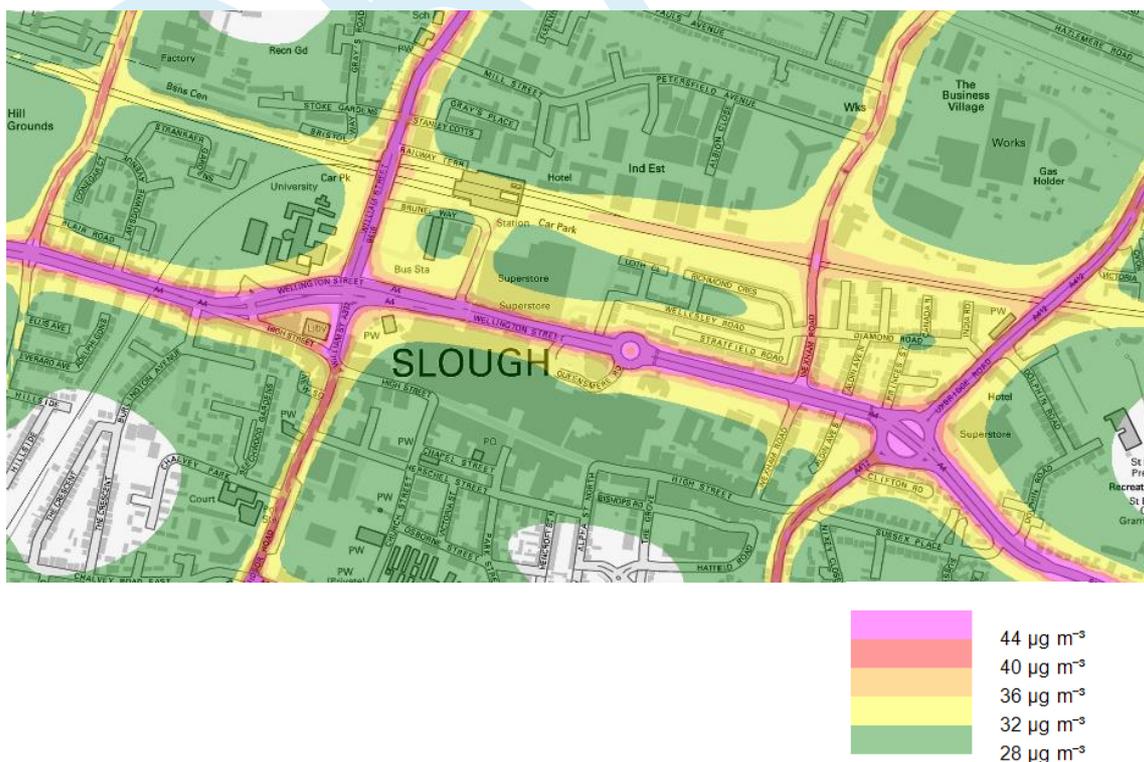


Figure 7 – Modelled NO₂ concentrations in the M4 AQMA (2014)



Figure 8 – Modelled NO₂ concentrations in the Tuns Lane AQMA (2014)

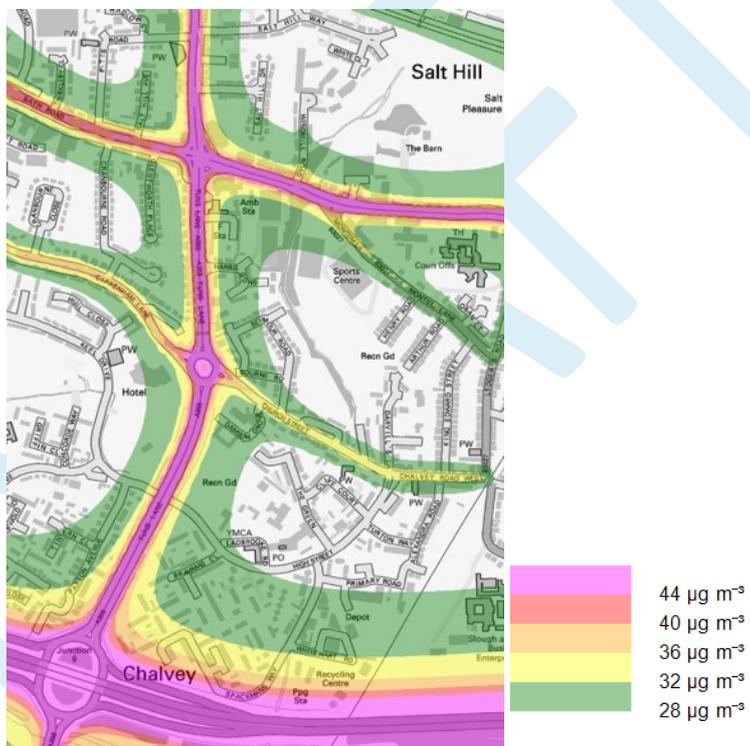


Figure 9 – Modelled NO₂ concentrations in the Brands Hill AQMA (2014)



SBC has undertaken modeling to look at the impact on NO₂ levels by improving the European Emission Standards⁷ of conventional vehicle technologies and also through the replacement of conventional vehicles with alternative technologies such as electric. The scenario modelling showed:

- The introduction of electric or Euro VI Standard buses would have a noticeable impact on NO₂ levels in the Town Centre AQMA
- Improving Heavy Goods Vehicles (HGV), Light Goods Vehicle (LGV) and bus emissions to a Euro VI Standard would have a significant impact at Brands Hill
- Simply switching diesel cars to petrol would have a very significant impact in all the AQMA

Particulate Matter

SBC monitors and has modelled the predicted levels of the fractions of particulate matter (PM₁₀ and PM_{2.5}) that are known to have a significant health impact. While levels are compliant with AQO there is still a significant health impact. Based on concentrations in 2016 it is estimated that levels of PM_{2.5} alone accounted for 6.2% of all attributable deaths in Slough (over 25s, see table 2).

Modelled levels of PM₁₀ and PM_{2.5} relating to the Town Centre, Tuns Lane and M4 AQMA in 2014 are shown in figures 10 and 11 respectively. Particulate pollution can be influenced by the long-range transportation of polluted air masses, however, road transport vehicles and non-road mobile machinery (NRMM) are the most significant sources in the urban area⁸ with biomass burning becoming a more prominent source.

Figure 10 - Modelled PM₁₀ concentrations for 2014 in the Town Centre, at Tuns Lane and along the M4



⁷ <https://www.dieselnet.com/standards/eu/ld.php>

⁸ Defra

Figure 11 - Modelled PM2.5 concentrations for 2014 in the Town Centre, at Tuns Lane and along the M4



2.2 HEALTH IMPACTS of AIR POLLUTION

It is estimated that the health impact of NO_2 in the UK accounts for 23,000 (9,500 – 38,000) premature deaths (see table 1), while the combined impact of NO_2 and particulate matter ($\text{PM}_{2.5}$) in the UK is estimated to cause 44,750 to 52,500 attributable deaths per annum, with an annual cost to society of £25.3bn to £27.9bn⁹.

Table 1 – Estimated health impact of NO_2 in the UK (2013 data)

	Central (2.5%)	Low (1%)	High (4%)
Annual equivalent attributable deaths	23,500	9,500	38,000
Annual Social Cost	£13.3bn	£5.3bn	£21.4bn

Studies show that the adverse health effects from short and long-term exposure to air pollution include:

- Increase in deaths from cardiovascular and respiratory diseases (COMEAP¹⁰)
- Increase in coronary events, including myocardial infarction and ischaemic heart disease¹¹

⁹ Tackling nitrogen dioxide in our towns and cities, UK overview document, DEFRA, December 2015,

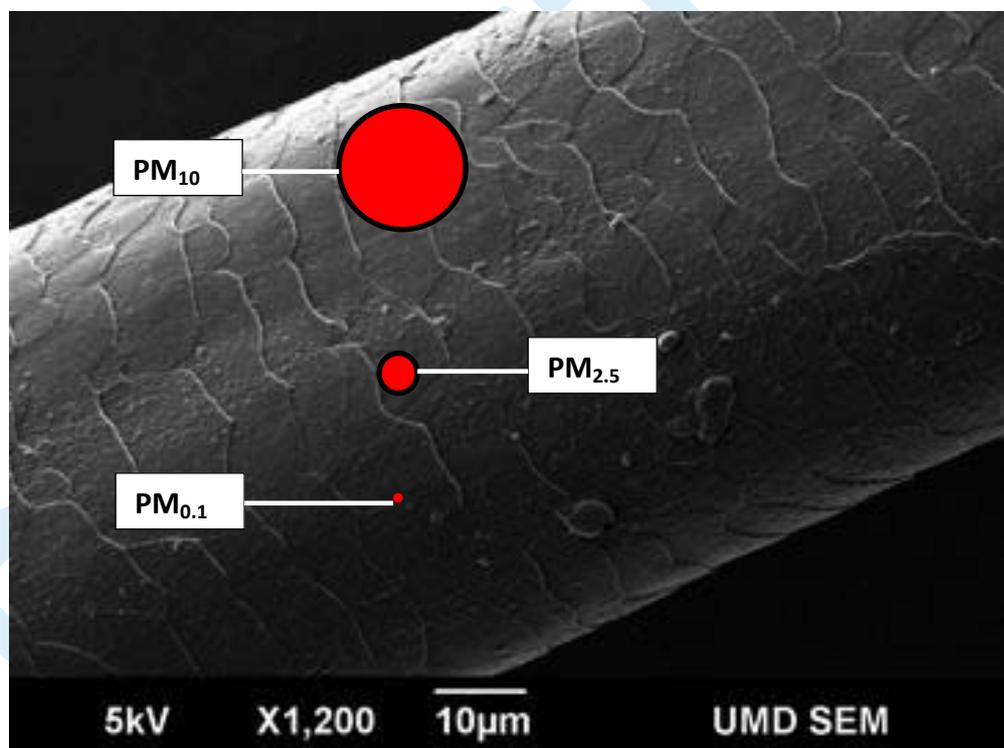
¹⁰ <https://www.gov.uk/government/groups/committee-on-the-medical-effects-of-air-pollutants-comeap>

¹¹ Cesaroni, BMJ, 2014

- Increase in low birth weight babies (<2500g)¹²
- Increase in childhood asthma development and wheeze¹³
- Inhibits neurological development in children¹⁴ (it is thought that particulates pass through the olfactory system into the brain where they prevent normal synapse development)
- Inhibits lung function in children, permanently affecting lung capacity¹⁵

The World Health Organisation (WHO) classifies diesel exhaust emissions as carcinogenic to humans with evidence linking air pollution with a range of cancers¹⁶ (lung and bladder in particular). The fraction of particulate matter that is of concern to human health is shown in figure 12.

Figure 12 - Particle size relative to human hair



PM₁₀ – coarse particles (smaller than 10 microns / 0.01mm)
 PM_{2.5} – fine particles (smaller than 2.5 microns / 0.0025mm)
 PM_{0.1} – ultra-fine particles (smaller than 0.1 microns / 0.0001mm)

SBC Public Health has looked at the likely health impact of air pollution in Slough to inform the development of the LES in 2015¹⁷. The report looked at the prevalence of key ill-health indicators and pollution levels in Slough, particularly impacts arising from particulate

¹² Pederson, Lancet, 2013

¹³ Takenoue, Paediatrics Int, 2012

¹⁴ Jordi Sunyer, CREAL, PRBB group leader, 18 June 2014

¹⁵ <http://www.escapeproject.eu>

¹⁶ http://www.iarc.fr/en/media-centre/iarcnews/pdf/pr221_E.pdf

¹⁷ Report on the likely health impact of air pollution in Slough to inform the LES, SBC, Public health, October 2015

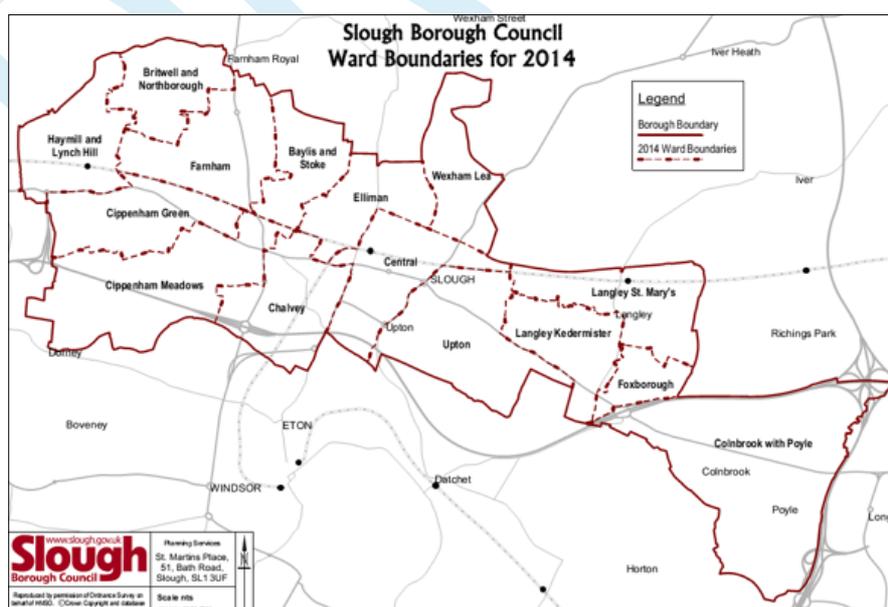
pollution. It is expected that data on the impact of NO₂ in each local authority area will be published soon and we will update our assessment of the impact of air pollution on health. The impact of fine particulates (PM_{2.5}) on the health of the residents of Slough is shown in table 2.

Table 2 - Estimated effects on annual mortality in 2016 of anthropogenic PM_{2.5} air pollution in Slough¹⁸

Area	Slough	South East	England
Mean anthropogenic PM2.5	11	9.8	9.3
Attributable fraction of deaths (%)	6.2	5.5	5.3
Attributable deaths	47	3,804	24,170
Associated life years lost	559	45,652	290,036

The preliminary SBC report on the impact of air pollution on health assessed rates of morbidity and mortality for certain illnesses broken down at ward level (see ward boundaries in figure 13). Figures 14 and 15 show respiratory mortality and premature respiratory mortality in Slough respectively. Figures 16 and 17 show the standard mortality rates (SMR) for coronary heart disease (CHD) and premature cardiovascular mortality in Slough respectively.

Figure 13 - SBC Ward Boundaries for 2014



¹⁸ <http://www.phoutcomes.info/public-health-outcomes-framework#page/3/gid/1000043/pat/6/par/E12000008/ati/102/are/E06000039/iid/30101/age/230/sex/4>

Figure 14 - Respiratory mortality (all ages) 2011-2015, by MSOA (source [Local Health: Deaths from respiratory diseases, all ages, standardised mortality ratio 2011-2015](#))

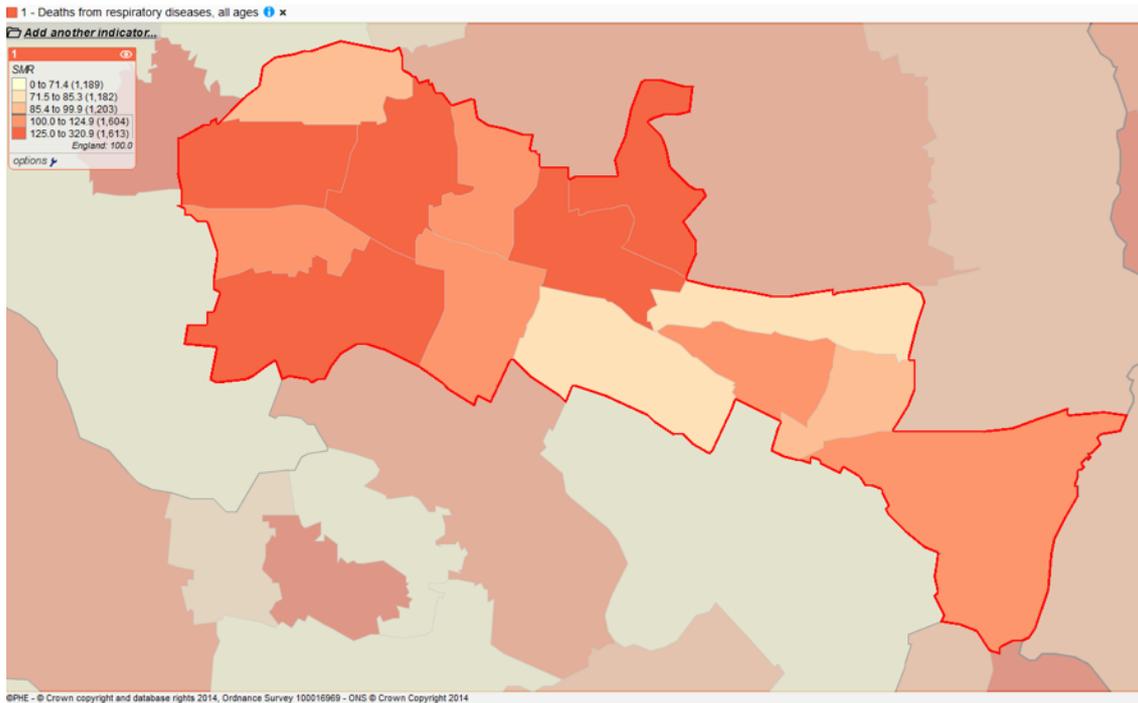
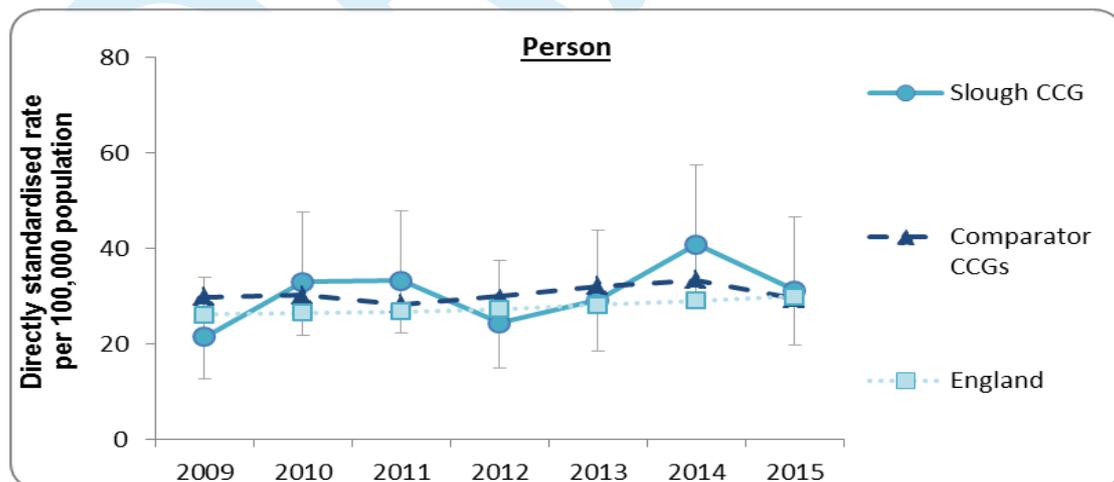


Figure 15 – Under 75 mortality for respiratory disease, per 100,000 population, in Slough (directly standardised rate 2009-2015)¹⁹



¹⁹ <https://beta.digital.nhs.uk/publications/clinical-indicators/nhs-outcomes-framework/current/domain-1-preventing-people-from-dying-prematurely-nof/1-2-under-75-mortality-rate-from-respiratory-disease>

Figure 16 – Standardised mortality ratios for CHD (all ages) 2011-2015, by MSOA (source Local Health: Deaths from CHD, all ages, SMR 2011-2015)

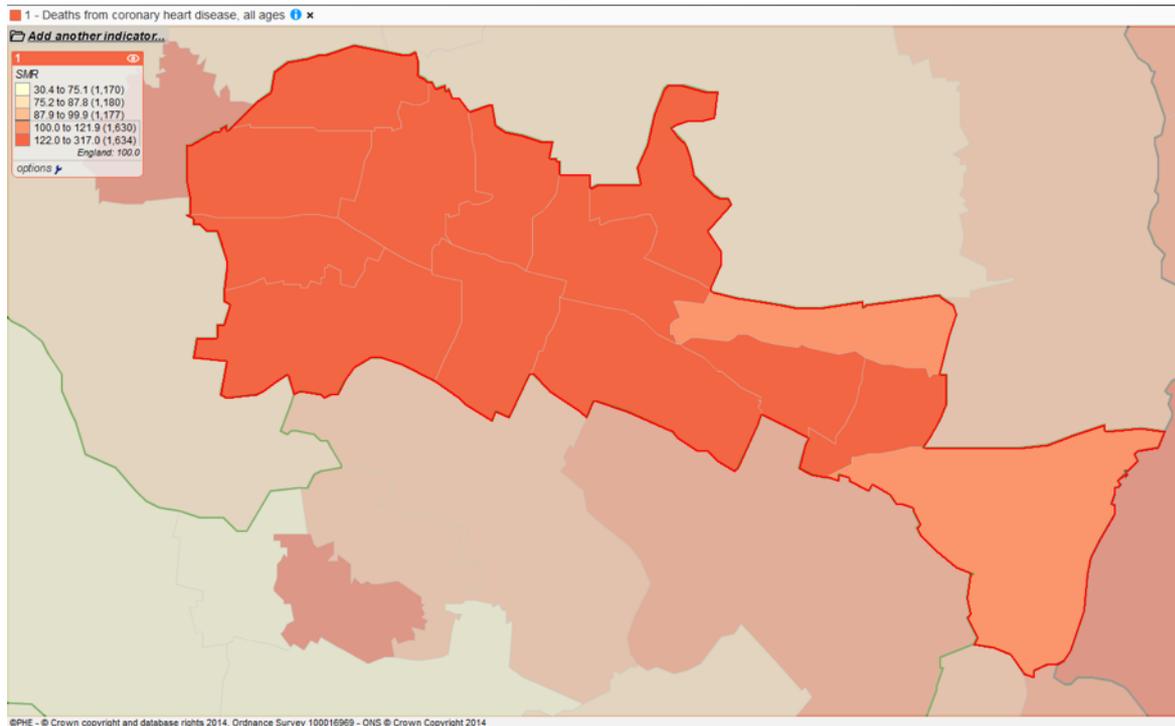
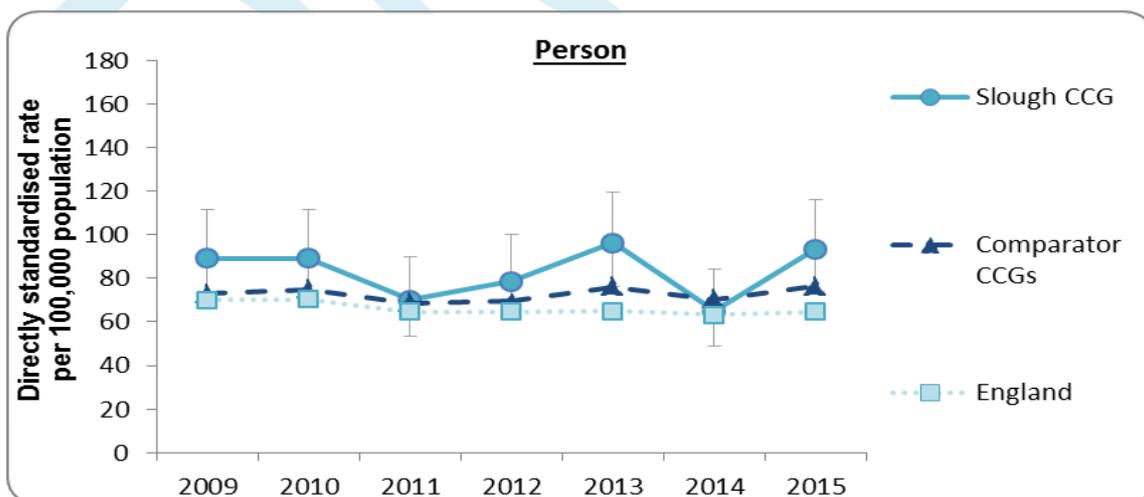


Figure 17 – Under 75 mortality for cardiovascular disease, per 100,000 population, in Slough (directly standardised rate 2009-2015)²⁰



²⁰ <https://beta.digital.nhs.uk/publications/clinical-indicators/nhs-outcomes-framework/current/domain-1-preventing-people-from-dying-prematurely-nof/1-1-under-75-mortality-rate-from-cardiovascular-disease>

The SBC Public Health Report states – “although above findings regarding air pollution and respiratory and cardiovascular health in Slough are suggestive of a general pattern of a disease surrounding areas with poor air quality, it is very difficult to draw direct inferences from these data alone. This is due to multiple confounding factors associated both with disease burden and with poor air quality, such as smoking prevalence and socioeconomic deprivation. Poor air quality particularly affects those with underlying, pre-existing health conditions.

However, given established evidence on the health effects of air pollution, the high levels of pollution in some localities and the wide disparity in cardiovascular and respiratory health across the borough, it is clear that improving air quality in the most affected areas could play an important role in increasing quality of life for people with respiratory disease and reducing Slough’s health inequalities in the long term. This may also offer important economic benefits, in terms of reduced hospital admissions and deaths prevented.

- Adverse health effects of air pollution, particularly those resulting from PM and NO₂, are well established both internationally and in the UK.
- Robust methods of quantifying the national and local impact of air pollution, and likely impact of reductions in air pollution, have been developed and implemented at a local level.
- Air quality in Slough is worse than the England average, with very high levels of pollutants concentrated around major roads and transport hubs. Several localities in the borough are exposed to levels of NO₂ that far exceed levels recommended by the European Commission.
- Slough is disadvantaged by a poor respiratory and cardiovascular health profile, with a burden of disease that is higher than expected rates based on regional and national averages.
- Slough also is affected by large geographical inequalities in respiratory and cardiovascular health, which correlate roughly with areas of high air pollution.
- The proportion of overall deaths in Slough that can be attributed to particulate air pollution is estimated at 6.2%. This is higher than the South East region and England as a whole, and is more comparable to London.
- Reducing air pollution in the borough provides an important opportunity to reduce the attributable burden of disease and possibly to reduce health inequalities.
- Established infrastructure for measuring air quality in Slough is an important asset that could facilitate research to evaluate the impact of the Low Emissions Strategy on air quality and health outcomes. This project may be possible with adequate academic and financial support in the medium to long term and would make an important contribution to the evidence base in this area. “

While levels of particulate pollution across the region meet EU Limit Values, there are significant health benefits in reducing particle levels as low as possible. The Public Health Outcomes Framework¹⁵ includes fine particulates (PM_{2.5}) as an indicator for health and SBC is committed to working in partnership to reduce levels.

The mortality and morbidity effects of exposure to poor air quality can be translated into an economic cost to society. It is estimated that air pollution imposes a cost of £16 billion²¹ per year in the UK. HM Treasury together with DEFRA have developed guidance²² on how to quantify the economic impact that policies, plans and projects have on air quality. The guidance uses annual “damage costs” to quantify the impact of different pollutants from different sectors. These damage costs mainly relate to the impacts on health.

Transport accounts for the most significant economic impact on air quality with an average “cost” of £44,430 and £25,252 per tonne of emissions for particulate matter (PM) and Oxides of Nitrogen (NOx) respectively. This impact is even greater in urban areas, for example in urban conurbations the damage cost associated with transport rises to £107,965 and £61,365 per tonne for PM and NOx respectively.

2.3 LEGAL COMPLIANCE

SBC has a legal duty under the Environment Act 1995²³ to review and assess air quality in the Borough and designate any areas where there is relevant exposure to the public to air pollution that is likely to exceed the Government Air Quality Objectives (AQO) as Air Quality Management Areas (AQMA). SBC is required to produce an Air Quality Action Plan (AQAP) to show how we will pursue the achievement of the AQO. This LES forms part of the AQAP for Slough.

Limits on air quality concentrations are set by the EU and adopted by Member States. In the UK the EU Limit Values are the same as the Air Quality Objectives (AQO) - see table 3. While local authorities have a duty to pursue Government Air Quality Objectives (AQO), there is no legal duty to meet the AQO, however, the reserve powers of the Localism Act 2011²⁴ allow for any EU fines to be passed onto any public authority “whose act or omission” has contributed to the breach in EU law.

The EU has commenced infraction proceedings against the UK Government and Devolved Administrations for failing to meet the legally binding EU Limit Value for NO₂. As the UK has voted to leave the EU it is unclear at present whether the current Limit Values will be retained or whether sanctions will be imposed. It should be noted that the main driver to improve air quality is public health and that EU Limit Values are health based and correlate with the World Health Organisation (WHO) Air Quality Guideline Values for NO₂, while the WHO recommends lower concentrations for particulate matter than the EU Limit Values (see table 4).

²¹ <https://www.gov.uk/guidance/air-quality-economic-analysis>

²² [Valuing impacts on air quality: Supplementary Green Book guidance, HM Treasury and DEFRA, May 2013](#)

²³ <http://www.legislation.gov.uk/ukpga/1995/25/contents>

²⁴ <http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted>

Table 3 - Limit Values & Target dates for NO₂ and PM compliance

Air Quality Directive 2008/50/EC - Limit Values and Target Dates for compliance for Nitrogen Dioxide and Particulate Matter			
		Limit Value (annual mean)	Target Date
Nitrogen Dioxide		40µgm ⁻³	1 st January 2010
PM₁₀		40µgm ⁻³	1 st January 2005
PM_{2.5}	Stage 1	25µgm ⁻³	1 st January 2015
	Stage 2	20µgm ⁻³	1 st January 2020

Table 4 - World Health Organisation (WHO) Air Quality Guideline Values

Air Quality Guideline Values (WHO)			
Pollutant		WHO Guideline Values	
		Short Term Exposure	Long Term Exposure (annual mean)
Nitrogen Dioxide (NO₂)		200 µgm ⁻³ (24hr)	40 µgm ⁻³
Particulate Matter (PM)	PM₁₀	50 µgm ⁻³ (24hr)	20 µgm ⁻³
	PM_{2.5}	25 µgm ⁻³ (24hr)	10 µgm ⁻³
Sulphur Dioxide (SO₂)		20 µgm ⁻³ (24hr) 500 µgm ⁻³ (10 min)	Not Required
Ozone (O₃)		100 µgm ⁻³ (24hr)	

3. CREATING A LOW EMISSION FUTURE: LEADING BY EXAMPLE

SBC recognises that it cannot improve air quality alone. However, we do believe that we can ensure that all relevant Council policies are designed to influence and reduce road transport emissions as far as possible, enabling us to work in partnership with key stakeholders to tackle the problems we face. Slough is planning for major regeneration and sustainable economic growth and this LES has been developed to compliment key policy areas in line with our ambitions to transform the Borough.

3.1 OVER-ARCHING STRATEGIES for SLOUGH

Slough Borough Council Five-Year Plan 2018-2023

The Five-Year plan is Slough's new corporate strategy for 2018-2023. It sets the Council's ambitions, challenges and how it will face these challenges with two key outcomes for Slough to be:

"Slough will be an attractive place where people choose to live, work and stay

Slough will attract, retain and grow businesses and investment to provide opportunities for our residents."

Two critical, long-term priorities for Slough are to:

"Improve air quality in the borough with innovative solutions

Work with major employers and Heathrow to reduce traffic congestion and emissions by the use of sustainable transport modes"

Transport has a major role to play in helping to address the challenges we face. Better transport, and the improved connectivity and accessibility which results, combined with the promotion of a shift to sustainable transport modes and vehicle emission reductions, outlined in the LES, can support many of the important Five-Year Plan Outcomes identified, in particular:

- Slough being a premier location for businesses;
- more homes, and better quality homes;
- a vibrant, safe, town centre providing business, living, and cultural opportunities;
- healthy children and young people with positive life chances;
- maximised value of the council's assets; and
- the Council as a leading digital transformation organisation.

As part of the Transport Strategy, the LES can help to capitalise on opportunities brought about through increased inward investment.

Wellbeing Strategy 2016-20

The Wellbeing Strategy is focussed on four key priorities for supporting the health and wellbeing of Slough's residents:

- protecting vulnerable children;
- increasing life expectancy by focussing on inequalities;
- improving mental health and wellbeing; and
- improving housing quality and tenure mix.

By tackling air pollution through a co-ordinated programme of vehicle emission improvement measures, the LES seeks to reduce the impact of air quality on the health of local residents in line with the Wellbeing Strategy.

Economic Development Plan for Growth 2014-18

The Economic Development Plan for Growth (EDPG) aims to provide an environment in Slough which supports businesses to thrive and grow, create job opportunities, and which helps residents develop the skills they need.



Slough Town Centre, 2016

The LES seeks to provide a platform for inward investment through the promotion of alternative vehicle emission technologies as part of the transition to a low emission economy. Alternative refuelling and electric vehicle charging infrastructure, new vehicle ownership and usage models, maintenance and ancillary support mechanisms and the development of SMART technologies to assist ultra-low emission vehicle (ULEV) take-up will require the development of new skills as part of the drive to put Slough at the forefront of creating low emission business opportunities.

3.2 TRANSPORT MANAGEMENT & TRAVEL PLANNING

SBC will:

- Promote modal shift away from cars to sustainable transport modes, including public transport, walking and cycling
- Undertake a Clean Air Zone (CAZ) feasibility study in line with the national Clean Air Zone Framework
- Promote the uptake of ultra-low emission vehicles (ULEV) in line with the Slough Electric Vehicle Plan

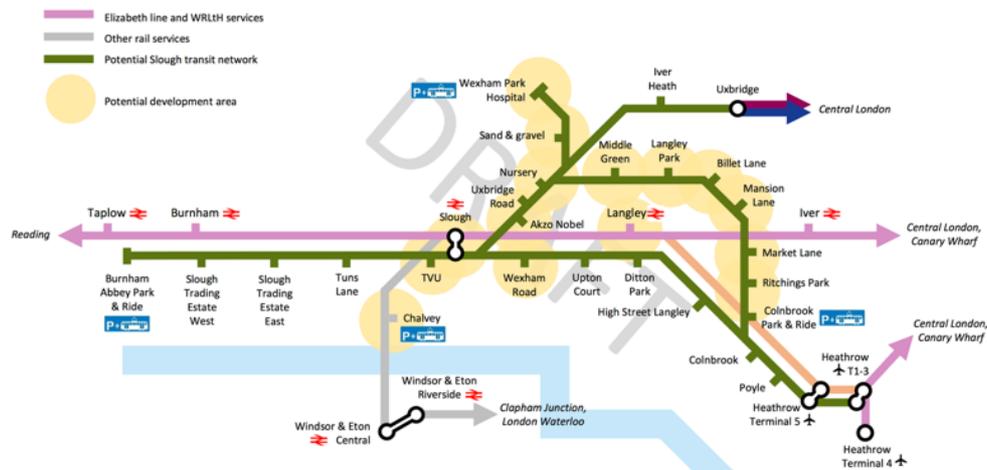
3.21 Significant development growth is planned for Slough, with the Local Plan Review²⁵ predicting the construction of over 900 dwellings per year until 2030. As part of the transport planning for such growth, SBC is in the process of updating the Local Transport Plan (LTP) 2012 and publishing a Transport Strategy²⁶. SBC Transport Policy focuses on sustainable modal shift and acknowledges that additional measures to improve vehicle emissions are required.

The draft Transport Strategy outlines the key strategy themes, building on the outcomes from the Local Transport Plan (LTP3), details major infrastructure projects, including Slough Mass Rapid Transit (SMaRT), the Elizabeth Line (formerly known as Cross Rail), M4 Smart Motorway and the Western Rail Link to Heathrow (WRLtH) and discusses further investment needed to deliver a transport network that will facilitate ambitious growth plans. Figure 18 illustrates current and potential major transport infrastructure projects in the Borough, including the proposed Slough Transit Network. The strategy recognises the challenges and opportunities that may arise from the construction of a third runway at Heathrow.

Figure 18 – Potential Slough Transit Network (shown in green)

²⁵ Local Plan Review, Issues and Options Committee Report 2016

²⁶ https://www.slough.gov.uk/downloads/SBC_IO_DraftTransportStrategy.pdf



Bike Hire Scheme – Montem Leisure Centre

3.22 Cycling

In recent years, delivery of our LTP3 Smarter Travel Strategy has been accelerated by additional funding through the government's **Local Sustainable Transport Fund (LSTF)**. Over the past five years, the Council and its partners have been delivering a £10 million programme of infrastructure, service and behavioural change measures intended to encourage a greater share of journeys to be made on foot, by bicycle or using public transport. Projects delivered or ongoing include:

- new off-road east-west cycle paths, such as through Salt Hill Park;
- on-road cycle route improvements, such as on Salt Hill Avenue;
- a bike hire scheme (additional docking stations and bicycles are planned);
- workplace business engagement and personalised travel planning including promotion of car clubs;
- an extensive way-finding programme;
- numerous improvements around schools to improve environments for pedestrians and cyclists (including a Safer Routes to School to aid pedestrians and cyclists);

- opening of a new cycle hub facility on Brunel Way close to Slough station;
- travel planning activities in schools (including Bike-It training);
- extensive use of travel plans as part of the development consent process for residential, commercial and educational uses;
- development of an east-west cycle route between Slough and Maidenhead (with Buckinghamshire CC).

Access Funding

Following a successful bid to the DfT Access Fund, SBC has been awarded £1.5m of revenue support to achieve our behaviour change goals. We will be beginning our campaign under the “Better By...” theme, including ambitious targets for sustainable modal shift. We will be committing to the following initiatives over the next 3 years:

- Engage with 30,000 employees across businesses and organisations in order to achieve mode shift in the borough
- Support 3,000 unemployed people access employment, education and training opportunities
- Encourage 15,000 pupils to take up sustainable modes of transport
- Engage residents across the borough and from areas with the highest health deprivation indices in Slough

The Sustainable Transport Team will be rolling out a number of sustainable travel events at key locations and within schools and businesses with more intense activity launching during Spring/Summer 2018.

This includes community engagement events and awareness campaigns such as;

- Cycle Training and Scooter Training for Children and Adults across the borough
- Group Cycle Rides on leisure and commuter routes around the borough
- Dr Bikes - free bicycle checks, minor repairs and maintenance advice for members of the public, school and employers
- Journey Planning for jobseekers, youths seeking education and training opportunities
- Bike Loans to disadvantaged families and community groups
- Cycling and Walking competitions, giveaways and competitive events
- Travel Planning advice for schools and businesses
- Targeted road safety awareness and advice
- Promoting mode-shift to car sharing, passenger transport and cycling and walking
- Advising businesses on implementing cycle to work schemes and achieving travel plan targets
- Providing matched funding to businesses to implement sustainable transport facilities such as cycle parking, shower facilities etc.
- Access to and promotion of the cycle hire scheme
- Production and distribution of information on our activities, infrastructure, routes and events
- Wayfinding totems to advise members of the public and highlight key attractions in Slough

Better by...



3.23 Clean Air Zones (CAZ)

The LES will form part of the Transport Strategy and provides further detail on key Strategy measures which have the potential to reduce emissions from road transport vehicles and accelerate the uptake of cleaner fuels and technologies. These include looking at the feasible implementation of Clean Air Zones (CAZ) and the promotion of ultra-low emission vehicles (ULEV).

In July 2017, the Government published its 'UK plan for tackling roadside nitrogen dioxide concentrations'²⁷. The plans set out the Government's approach to improving air quality in the UK, reducing health impacts, and fulfilling its legal obligations. The plans include a framework for implementing Clean Air Zones (CAZ) in the UK²⁸. The framework identifies towns and cities where NO₂ concentrations are predicted to exceed the EU Limit Value in 2020 and five cities outside London, comprising Birmingham, Derby, Leeds, Nottingham and Southampton, will be legally required to introduce Clean Air Zones (CAZ) in the shortest possible time and by 2020 at the latest. London will be required to introduce an Ultra-Low Emission Zone in 2019 that will initially cover the Congestion Charging Area and then be expanded to the area bounded by the North and South Circular roads. The framework also identifies over 20 other towns and cities that will also be considered for mandated CAZ.

The aim of CAZ is to bring together local measures to deliver **immediate action** to improve air quality and health with **support for towns and cities to grow** while delivering sustained reductions in pollution and a **transition to a low emission economy**. Where there are the most persistent pollution problems, this is supported by restrictions to encourage only the cleanest vehicles to operate in the town or city.

²⁷ <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

²⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/612592/clean-air-zone-framework.pdf



Clean Air Zones fall into two categories:

- **Non-charging Clean Air Zones** – These are defined geographic areas used as a focus for action to improve air quality. This action can take a range of forms but does not include the use of charge-based access restrictions. Emission standards for buses, coaches and taxis are required in addition to measures to promote the uptake of ULEVs
- **Charging Clean Air Zones** – These are zones where, in addition to the above, vehicle owners are required to pay a charge to enter, or move within, a zone if they are driving a vehicle that does not meet the particular standard for their vehicle type in that class of zone. Clean Air Zone proposals are not required to include a charging zone. Certain exemptions may be granted for specialist vehicle types including emergency vehicles.

With current and predicted air quality levels in Slough, SBC will assess the feasibility of implementing a CAZ in the Borough, including non-charging and charging CAZ requirements. The type of zone envisaged would not include passenger vehicles.

Further information can be found in Section 4 – Slough Clean Air Zone (CAZ) Framework.

3.3 LAND-USE PLANNING & DEVELOPMENT MANAGEMENT

SBC will:

- **Adopt Air Quality Planning Guidance to provide clarity to developers through the planning system**
- **Seek air quality mitigation to be integrated into development schemes at the design stage**
- **Require appropriate air quality mitigation, proportionate in scale and kind to development scheme impact, including off-set mitigation on major schemes**
- **Introduce standards for plug-in vehicle charging on new development schemes**
- **Adopt emission controls for non-road mobile machinery (NRMM)**

3.31 Introduction

Local Planning Authorities have to weigh up the economic, social and environmental factors when deciding to grant or refuse planning permission or decide if conditions are required to achieve sustainable development.

Air quality is a material consideration that planners are required to take into account when making their plans and when taking planning decisions. A key objective of the Slough LES development is to produce technical guidance for the consideration of air quality through the land-use planning and development control system. The LES approach aims to simplify the consideration of air quality impacts associated with development schemes and focus on

the incorporation of mitigation at design stage, countering the cumulative impacts of aggregated developments and providing clarity to developers.

3.32 National Policy & Practice

National Planning Policy Framework

National planning policy is set by the National Planning Policy Framework (NPPF, 2018)²⁹. The NPPF places a general presumption in favour of sustainable development, stressing the importance of local development plans.

In terms of the consideration of air quality in the planning process, the NPPF states:

(Paragraph 170) “Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;”

Additionally, the NPPF states:

(Paragraph 181) “Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

(Paragraph 183) The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

National Planning Practice Guidance

²⁹

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/733637/National_Planning_Policy_Framework_web_accessible_version.pdf

National Planning Practice Guidance (NPPG)³⁰ provides advice to planning authorities on implementing the NPPF, including guidance on how air quality can be considered as part of the planning process, stating that, “Local Plans may need to consider:

- the potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments;
- the impact of point sources of air pollution (pollution that originates from one place); and,
- ways in which new development would be appropriate in locations where air quality is or likely to be a concern and not give rise to unacceptable risks from pollution. This could be through, for example, identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or **low emissions strategy** where applicable.

When deciding whether air quality is relevant to a planning application, considerations may include whether the development would:

- Significantly affect traffic in the immediate vicinity of the proposed development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more.
- Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area;
- Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality.
- Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.”

The NPPG states that where a planning proposal, including mitigation, prevents sustained compliance with EU Limit Values or National Objectives for air quality and cannot be made acceptable then refusal of planning permission should be considered.

3.33 Slough Local Plan

The Planning and Compulsory Purchase Act 2004, amended by the Localism Act 2011 requires planning authorities to prepare Local Plans. As part of the Slough Local Development Framework, the Core Strategy 2006-2026 was implemented in December 2008³¹. The Core Strategy includes policies to minimize and mitigate any development

³⁰ <https://www.gov.uk/government/collections/planning-practice-guidance>

³¹ http://www.slough.gov.uk/downloads/Adopted_Core_Strategy_16-12-08.pdf

impacts on air quality and also prevent future occupants of developments being exposed to levels of poor air quality. SBC is currently updating its Local Plan³² and consulting on issues and options. The Local Plan Update (2016 – 2036) seeks to address the challenges that Slough faces over the coming years, including:

Building new homes - *The population of Slough is expected to grow by more than 15% in the next 20 years and we will require around 20,000 new homes to accommodate residents.*

The economy and town centre – *Slough has a diverse economy that has both local and national significance. Lots of skilled workers commute into Slough and it is estimated that 15,000 jobs could be created in the next 20 years.*

Getting around Slough – *Slough is well connected but the transport network is under pressure, especially from vehicle congestion, with new developments like Crossrail and Heathrow expected to put more strain on the road network. We need to encourage more people to walk, cycle and use public transport and also consider restricting some sorts of vehicle traffic through the town.*

Good design and environmental standards – *We need to ensure new developments are well designed, protecting our green space and also protecting against air, noise and soil pollution that could arise from population growth and Heathrow expansion. We need to encourage the development of low carbon technology and ‘green’ infrastructure.*

The Local Plan will take account of air quality issue in identifying areas for future development and include development policies relating to local air quality management that will fulfil the NPPF sustainable development criteria. The LES supports the implementation of the strategic and development policy framework provided by the Local Plan.

Full Air Quality and Planning Guidance will be published. An outline of the guidance is provided below.

3.34 Development Classification, Assessment and Mitigation

The air quality assessment process follows a three-stage process:

1. Determining the classification of the development proposal;
2. Assessing and quantifying the impact on local air quality;
3. Determining the level of a mitigation required by the proposal to make the scheme acceptable.

Stage 1 - Development Type Classification

The classification of developments is shown in tables 5 and 6. The assessment and mitigation of development proposals is shown in figure 19.

Table 5 – Air quality classification of developments

Scheme Type	Minor	Medium	Major
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³² www.slough.gov.uk/localplan

Scheme Type	Minor	Medium	Major
Threshold	Below SBC threshold criteria for a Transport Assessment ³³ or Travel Plan ⁴	Meets SBC threshold criteria for a Transport Assessment ³ or Travel Plan ³⁴	Medium type developments which also trigger any of the following criteria: i) Where development is within or adjacent ³⁵ to an AQMA or CAZ ii) Where development requires an EIA ³⁶ and air quality is to be considered iii) Where any of the criteria in Table 6 are triggered
Assessment	None (other than for exposure)	None (other than for exposure)	Air Quality Assessment required including an evaluation of changes in vehicle related emissions
Mitigation	Type 1	Types 1 and 2	Types 1,2 and 3

³³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263054/guidance-transport-assessment.pdf

³⁴ <http://www.slough.gov.uk/business/planning-and-building-control/travel-plans-for-new-developments.aspx>

³⁵ Where development has potential to impact on concentrations in AQMA or CAZ

³⁶ <https://www.gov.uk/guidance/environmental-impact-assessment>

Table 6 – Additional Trigger Criteria for Major Developments

- Proposals in areas where sustained compliance with EU Limit Values may be at risk
- Any development proposing a net increase of 100 or more parking spaces
- Any development that causes a change in LDV (cars and small vans) flows of:
 - more than 100 AADT within or adjacent to an AQMA, CAZ or exceedance area
 - more than 500 AADT elsewhere
- Any developments that could increase traffic flows by 5% or more in road canyons with > 5,000 AADT
- Any development that causes a change in HDV flows (lorries, large vans and buses) of:
 - more than 25 AADT within or adjacent to an AQMA, CAZ or exceedance area
 - more than 100 AADT elsewhere
- Proposals that could introduce or significantly alter congestion (DfT Congestion) and includes the introduction of substantial road infrastructure changes
- Proposals that reduce average speeds by more than 10 km per hour
- The construction, widening or repositioning of a road in the vicinity of sensitive receptors
- Where significant demolition and construction works are proposed
- Where a centralised combustion unit of thermal input >300kWh is proposed
- All biomass boiler applications
- All stand-by/short-term power generation units regulated by the Environment Agency

*AADT = Annual Average Daily Traffic flows

Stage 2 - Air Quality Impact Assessment

MINOR and MEDIUM Classified Proposals

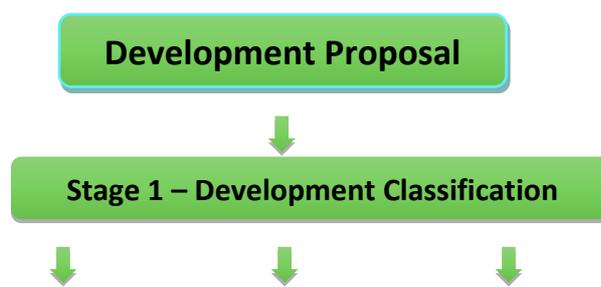
Smaller development proposals may not in themselves create an additional air quality problem but will add to local air pollution and potentially introduce more people likely to be exposed to existing levels of poor air quality. An assessment of the likelihood of introducing additional exposure will be determined using the following criteria:

- The proposal is adjacent to or within an AQMA;
- The proposal is in a location 20m from roads at or above the relevant national objective highlighted on the DEFRA GIS modelled maps - <http://uk-air.defra.gov.uk/data/gis-mapping>
- The proposal is one of the Land Use types:
 - C1 to C3;
 - C4 (Homes of Multiple Occupation);
 - D1

The outcome of the exposure assessment will determine the level of mitigation required make the development acceptable. Should there be no acceptable mitigation the recommendation may be to consider refusing the proposal on air quality grounds.

DRAFT

Figure 19 – Classification, assessment & mitigation of new developments



MAJOR Classified Proposals

It is important that all major schemes should identify suitable assessment requirements and potential mitigation through pre-application discussions. The scale and nature of this type of proposal is such that a detailed air quality assessment will be required to determine the impact on public health and the local environment. The assessment requires:

- The identification of the level of exposure through the change in pollutant concentrations including cumulative impacts arising from the proposal, during both demolition/construction operations and operational phases. Mitigation measures should be identified and modelled where practicable.
- The calculation of pollutant emissions of NO_x and PM from the development.
 - A. The methodology to be used for the determination of pollutant concentration change should meet the requirements of the Department for the Environment, Food and Rural Affairs (DEFRA) Technical Guidance Note LAQM TG. (16)³⁷. Further details of the air quality assessment requirements can be obtained from the Environmental Quality Team.
 - B. The evaluation of emission increases due to vehicle trips over the first 5 years from commencement of scheme operation. Where there is a multi-year construction programme this should be incorporated into the air quality assessment, including the evaluation of construction vehicle and machinery emissions over the course of the build programme.

Stage 3 - Mitigation

Where mitigation is not integrated into a proposal, SBC will require this through planning conditions. The NPPF (paragraph 32) states that “Where significant adverse impacts are unavoidable, suitable mitigation measures should be proposed (or, where this is not possible, compensatory measures should be considered).”

If on-site mitigation is not possible then SBC will seek off-set mitigation for the identified air quality impacts through a section 106 agreement or similar agreement.

Default mitigation measures are presented for each type of proposal that demonstrate a minimum requirement. This is not an exhaustive list and will be adapted for particular locations and needs identified by SBC and the scale of scheme impact. SBC also welcomes the opportunity to work with developers to devise innovative measures that will lead to improving local air quality.

³⁷ <https://laqm.defra.gov.uk/technical-guidance/>

Type 1 mitigation is listed in table 7 and Types 2 and 3 are listed in tables 8 and 9 respectively.

Due to elevated concentrations of particulate matter in Slough, Medium and Major developments will be required to implement suitable abatement controls for the use of non-road mobile machinery (NRMM) – see table 10.

Type 1 Mitigation

Table 7 – Type 1 Mitigation

Plug-in Vehicle Re-Charging:

Residential:

1 charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking) and ensure appropriate cabling is provided to enable increase in future provision. The residential EV charging points must have a 'Type 2' socket and be rated to at least 3.6kW 16amp or 7kW 30amp single phase

Commercial/Retail:

At least 10% EV charging provision for all car parking spaces. The commercial/retail EV charging points must have at least a 'Type 2' sockets, and be Mode 3 enabled EV charging units and be rated at least 7.4Kw 32 amp to 22Kw 32 amp (single or 3 phase). The number of EV charging points required at the opening of the development must meet at least 50% EV charging provision, with the remainder of the EV chargers being installed at an agreed date. At least 1 charging unit should be provided for every 10 disabled parking spaces. On retail sites where 50 parking spaces or more are provided as part of the development then one rapid charging unit (43kW/50kW) per 50 spaces shall also be considered and parking time limited to a maximum of 1 hour to allow for public access car parks.

Industrial:

At least 10% of parking spaces which may be phased with at least 50% initial provision and the remainder at an agreed date. At least 1 charging unit should be provided for every 10 disabled parking spaces. The EV charging points must have 'Type 2' sockets, be Mode 3 enabled EV charging units and be rated at least 7.4Kw 32 amp to 22Kw 32 amp (single or 3 phase).

Electric Vehicle Charging Standards will be kept under continuous review and amended as required to comply with the relevant British Standards, ISO standards, IET Codes of Practice and The Alternative Fuels Infrastructure Regulations 2017 (and subsequent amendments).

Code of Construction Practice

Construction Environmental Management Plan (CEMP) to be incorporated into MEDIUM and MAJOR developments and agreed with Council Officers. This shall include

NRMM controls (see table 10)

Green Infrastructure

Where it can be shown that such infrastructure will reduce exposure from air pollution

Heating

All developments should consider whether zero emission heating and power systems such as solar, ground and air source heat pumps, fuel cells can be integrated into scheme design

All gas-fired boilers to meet a minimum standard:

- Individual gas fired boiler <40mgNO_x/kWh
- Spark ignition CHP engine 95mgNO_x/Nm³ (in or adjacent to AQMA)
- Spark ignition CHP engine 250 mgNO_x/Nm³ (not affecting AQMA)
- Gas turbine 20mgNO_x/Nm³

Compression ignition engine 400 mgNO_x/Nm³

Type 2 Mitigation

Measures to be considered where appropriate

Table 8 – Type 2 Mitigation

- Monitored Travel Plan
- Measures to support public transport infrastructure and promote use
- Measures to support cycling and walking infrastructure
- Measures to support the Slough Electric Vehicle Plan
- Measures to integrate with electric car clubs
- Non-road mobile machinery (NRMM) controls (see table 10)
- Construction Environmental Management Plan (CEMP)

Commercial development specific:

- Use reasonable endeavors to use/require vehicle use complying with the latest European Emission Standard
- Provide a fleet emission reduction strategy, including low emission fuels and technologies, including ultra-low emission service vehicles

Type 3 Mitigation

Table 9 – Type 3 Mitigation

Off-set mitigation to support:

- Support for the Slough Low Emission Programme
- Feasible implementation and operation of Clean Air Zone (CAZ) and ULEV standards for buses
- Support for the Slough Electric Vehicle Plan
- Electric Car Clubs
- Cycle hire and network provision programme
- Plugged-in development and demonstration schemes
- Infrastructure for low emission, alternative fuels eg. refuse collection services and HDVs

Further information on the suitability of mitigation for developments can be obtained from the SBC Environmental Quality Team and through pre-application discussions.

Table 10 – Non-Road Mobile Machinery (NRMM) Controls

NRMM of net power between 37kW and 560kW will be required to meet the standards based upon the engine emissions standards in EU Directive 97/68/EC and its subsequent amendments. This will apply to both variable and constant speed engines for both NOx and PM. These standards are:

(a) NRMM used on the site of any MEDIUM classified development will be required to meet Stage IIIA of the Directive as a minimum.

(b) NRMM used on any MAJOR classified development will be required to meet Stage IIIB of the Directive as a minimum.

From 1 September 2020 the following changes will apply:

- (a) NRMM used on any construction or demolition site within the Slough urban area will be required to meet Stage IIIB of the Directive as a minimum.
- (b) NRMM used on any MEDIUM or MAJOR classified development will be required to meet Stage IV of the Directive as a minimum.

The requirements may be met using the following techniques;

(a) Reorganisation of NRMM fleet (b) Replacing equipment (with new or second hand equipment which meets the policy) (c) Retrofit abatement technologies (d) Re-engineing.

All eligible NRMM should meet the standards above unless it can be demonstrated that the machinery is not available or that a comprehensive retrofit to meet both PM and NOx emission standards is not feasible. The NRMM standards will be kept under review in line with UK/EU provisions.

3.35 Non- Transport Related Emissions from Developments

While road transport vehicle emissions are a significant cause of elevated pollution levels in the Borough and the primary focus of this guidance, there is concern that the increased use of biomass, for heating and power, and the use of diesel generators (including back-up emergency generators) for electricity has the potential to hinder the Council's efforts to improve air quality.

It is considered that the un-mitigated combustion of biomass and use of large-scale diesel generators is not appropriate within the Slough urban area. Developments including the following will be subject to a full air quality assessment and planning approval resisted where there is a detrimental impact on air quality within the urban area:

- Use of biomass for heating or power
- Use of diesel generators for power
- Part A, A2 and B Processes prescribed under the Environmental Permitting Regulations 2010 (as amended)
- Any other point source requiring an Environmental Impact Assessment (EIA)

Further information on non-transport related emissions will be included in the full Air Quality and Planning Guidance that will be produced as part of the Air Quality Action Plan 2019.

3.4 PUBLIC SECTOR PROCUREMENT

SBC will:

- Require minimum vehicle emission standards as part of Social Value procurement processes where relevant
- Set emission standards for all major contracts eg maintenance etc, where vehicle use is inherent in the contract
- Use whole life costs (WLC) in the evaluation of vehicle procurement exercises, including the consideration of alternatives to diesel technology.
- Ensure the Waste and Recycling Fleet complies with the Euro VI Emission Standard from 1st December 2017
- Seek to migrate the refuse collection vehicle (RCV) fleet to natural gas / biomethane as part of the next procurement cycle
- Review the SBC light commercial fleet and pursue opportunities to transfer to plug-in vehicles where feasible
- All SBC light commercial and community service vehicles will meet the Euro 6/VI Emission Standard
- SBC will comply with best practice laid down by the Government

3.41 Procurement is an essential process enabling the Council to fulfil its responsibility to provide cost effective and efficient services which deliver the Council's priorities. The Council's aim is to promote effective procurement across the whole organisation using innovative, sustainable and modern procurement practices, harnessing a culture of continuous improvement, whilst remaining flexible to a rapidly changing environment and new models of, and partnerships in, the delivery of services.

Recent legislation and guidance encourages the public sector to support the uptake and deployment of low emission vehicles through sustainable procurement decisions. The areas of procurement which can contribute to a reduction in vehicle emissions are:

- a) Contracts relating to goods and services provided to public sector organisations*
- b) Procurement of vehicles by the public sector*

3.42 Goods and Services Provided to the Public Sector:

Social Value

Public sector organisations are required to look at best value, rather than lowest cost, when making procurement decisions. The Public Services (Social Value) Act 2012³⁸ came into force on the 31st January 2013. The Act, for the first time, places a duty on public bodies to consider social value, including environmental considerations, ahead of a procurement. The wording of the Act states that:

The authority must consider—

(a) how what is proposed to be procured might improve the economic, social and environmental well-being of the relevant area, and;

(b) how, in conducting the process of procurement, it might act with a view to securing that improvement.

While the requirements do not apply to all types of procurement The Act provides scope to include the consideration of vehicle emissions, arising from contract delivery and their impact on the health of the community, where the requirements do apply.

Sustainable Award Criteria

Sustainability should be one of the criteria which is considered in all procurement decisions. Vehicle emissions can be considered in award decisions as part of sustainable procurement practices. The extent to which organisations give weight to vehicle emissions will depend on circumstance and cost, however, all general contracts involving road vehicles, such as the delivery of goods to the Council, will include a standard clause relating to vehicle emissions – see figure 20.

Figure 20 – Standard vehicle emission clause in relevant general contracts

All contractors using commercial goods vehicle/s in the delivery of a SBC contract shall use reasonable endeavors to ensure that diesel vehicle emissions comply with European Emission Standard VI/6 and Euro 6 c when introduced.

In such cases, contractors shall supply an inventory of the vehicles to be used in the delivery of the contract and their European Emission Standards. SBC must be notified should any other vehicle not of the specified Standard be used in exceptional circumstances.

SBC will take into account vehicle emission standards that go beyond Euro VI/6, including the use of low emission alternative fuels (eg. Natural gas/biomethane/hydrogen) or zero emission capable vehicles, as part of tendering and evaluation processes.

There is potential for suppliers to gain a competitive advantage in tendering for public sector contracts through the consideration of the emissions of the vehicles they use.

³⁸ <http://www.legislation.gov.uk/ukpga/2012/3/enacted>

With respect to the procurement of larger scale contract services, both in-house and external providers eg Environmental Services, Repairs, Maintenance and Investment (RMI contract), Community Transport Fleet Services and other major contracts with significant fleet profiles minimum vehicle emission requirements are specified in figure 21.

Figure 21 – Vehicle Emission Standards for large scale service contracts

- A Minimum standard of EURO VI/6 (fleet profile) – note EURO 6 for fleet defined as LDV (Vehicles below 3.5 tonnes) and EURO VI for fleet defined as HDV (Vehicles above 3.5 tonnes)
- A 10% uptake of Electric/hybrid/gas of the total fleet profile (by 2018) rising to 25% of the total fleet profile (by 2021)
- A 3% reduction per annum CO2 targets for fleet emissions (contractually obliged to commit to)
- A 3% reduction per annum of fuel saving targets fleet emissions (contractually obliged to commit to)
- Mandatory Environmental reporting requirement built into the specification (including Fleet Profile (make, model, size), annual mileage recorded, fuel type) – from this we can work out the carbon, NOx and particulate emissions assuming an average speed profile

3.43 Local Sourcing

Local sourcing is practiced widely by local authorities. Such initiatives have the potential to support the local economy while helping reduce overall mileage for deliveries and thereby reducing emissions from vehicles. Local sourcing offers the potential for lighter goods vehicles to be used in delivery.

3.44 Procurement of Public Sector Vehicles

The **Cleaner Road Transport Vehicles Regulations 2011 (CRTV Regs)** require public sector organisations to consider the energy use and environmental impact of vehicles they buy or lease. A key concept of the Regulations is the consideration of **whole life costs** whereby the operational costs over a vehicle life, including pollution damage costs, are taken into account rather than just the purchase price. This helps to redress the issue of low emission vehicles costing more than conventional vehicles, while potentially having lower operating costs that outweigh the purchase increment.

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, including:

- Energy consumption
- Carbon Dioxide emissions
- Emissions of Oxides of Nitrogen, Hydrocarbons and Particulate Matter
- Noise can also be taken into account

To satisfy the requirements of the Regulations, one of 3 options must be chosen:

1. The technical specification for energy and environmental performance is set out in the documentation for the purchase and leasing of road transport vehicles or services.
2. Energy and environmental performance is included as part of the contract award criteria.
3. A monetised whole life cost assessment, including the damage cost of lifetime emissions, is carried out as part of the tender evaluation.

Therefore, to carry out any vehicle or transport service procurement one of these three options MUST be included in the procurement process.

SBC has led by example and has implemented the requirements of the CVTR Regs in respect of the procurement and operation of the SBC Fleet. We will work with other public sector organisations, including the NHS, to promote best practice in vehicle procurement exercises.

3.45 SBC Environmental Service Fleet Vehicles

SBC has in-sourced its waste collection and highways operation that became operational from the 1st December 2017. As part of this process, SBC carried out an appraisal of the whole life costs and benefits associated with diesel refuse collection vehicles (RCV) and alternatives. The study was published by the Local Government Association as best practice³⁹. The study illustrated the emission and costs savings from alternatives to diesel RCVs (see figure 22 and table 11), and the feasibility of providing a biomethane refueling station at the Chalvey Depot (see figure 23).

While it wasn't possible to procure suitable Euro VI gas/biomethane RCVs for the operational commencement of the RCV fleet, the Council will operate Euro VI diesel RCVs and has committed to consider the transition of the RCV fleet to natural gas/biomethane or electric during the next procurement cycle completed by 2024.

³⁹ <http://www.local.gov.uk/sites/default/files/documents/sloughs-rcv-options-appra-d7c.pdf>

Figure 22 – Expected SBC lifetime emission costs of diesel RCVs and alternatives

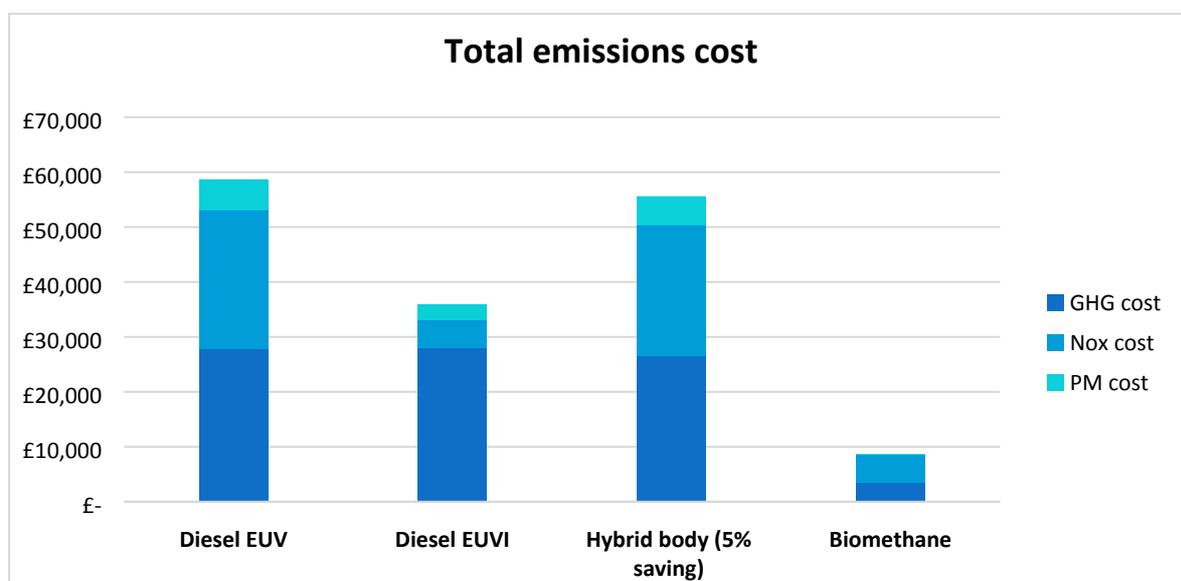
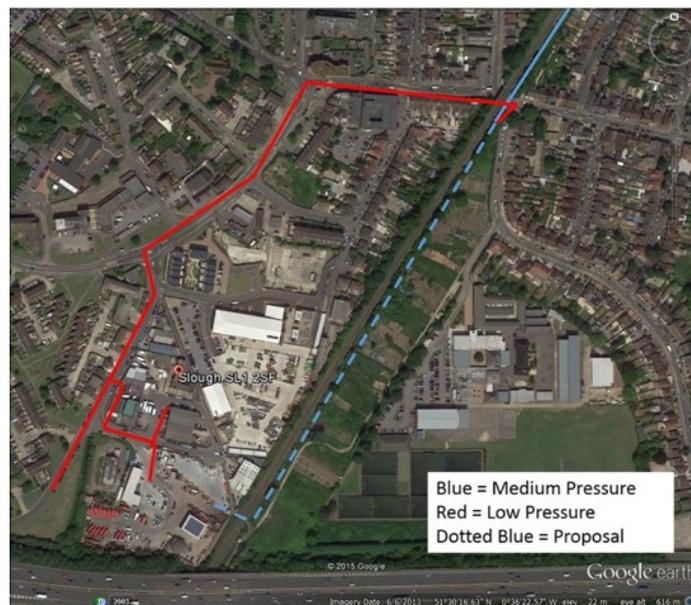


Table 11 – Costs of operating SBC RCVs on biomethane compared with diesel

Fuel price scenario	High fuel cost difference	Low fuel cost difference
Assumptions: Diesel price includes AdBlue, 4%, 35ppl Gas price is includes electricity @ 5ppkg and biomethane certificate @ 2.8p	Diesel price: £1.17 Gas price: £0.74 Difference: £0.42	Diesel price: £0.93 Gas price: £0.67 Difference: £0.26
Annual per vehicle saving: (range due to fuel efficiency in brackets)	£6,503 (£5,626 - £7,380)	£4,435 (£3,648 - £5,222)
Total annual fleet saving: (range due to fuel efficiency in brackets)	£130,055 (£112,514 - £147,596)	£88,703 (£72,959 - £104,448)

Figure 23 – Map of gas pipe-lines in vicinity of the Chalvey Depot



3.46 SBC Community Transport Fleet

SBC is currently carrying out a review of the fleet of the Council's Community Transport Fleet and is committed to procuring ultra-low emission alternatives to diesel where feasible going forward. This work is being co-ordinated by a Fleet Challenge Team (FCT) that is authorised to develop, introduce and manage corporate transport related strategies and policies for the Council. The FCT is charged with supporting, monitoring and reporting that vehicles, including plant items where applicable, used by the Council are:

1. Where procured - are procured using whole life costing comparisons and sustainability.
2. Where hired - are hired based on lowest emissions available suitable for the task required.
3. Where used - are used in the most fuel efficient manner achievable.

The FCT is investigating viable alternative fuels and is working with other services who are procuring, hiring or using vehicles to establish formal evidence of:

1. Consideration of using ultra low emissions vehicles (ULEV)
2. Exploration and trialling of any fuel-saving or emission reducing technologies.

Where it is not yet feasible to procure ULEVs, we will ensure that the Community Transport Fleet will comply with a minimum Euro 6/VI Emission Standard.

3.47 All SBC vehicle procurement activities comply with best practice under the Government Buying Standards for Transport⁴⁰.

⁴⁰ <https://www.gov.uk/government/publications/sustainable-procurement-the-gbs-for-transport-vehicles>

3.5 SBC FLEET CHALLENGE

SBC will:

- **Implement a Travel Hierarchy providing access to alternatives to car use to avoid unnecessary journeys and increasing the use of electric pool cars and bikes**
- **Build on the successful 'My Electric Avenue' Project to increase the take-up of ULEVs, reduce emissions and save costs for both staff and the Council**

3.51 Following an application by the Environmental Quality Team, Energy Saving Trust carried out a fleet review on SBC's fleet and identified several opportunities for reducing the emissions of our 'grey fleet' ie vehicles owned and used by staff as part of their Council duties, and introduced the idea of a travel hierarchy and pool/car club models and hire car options. The SBC grey fleet has the largest environmental impact producing 401 tonnes of carbon dioxide in 2014/15 from staff driving 0.9 million business miles. The grey fleet is reimbursed at the HMRC rate of £0.45/mile also staff who exceed 1,000 business miles/annum can claim a £1,000 lump sum allowance this means the real rate of reimbursement is closer to £0.79/mile in 2014/15, excluding any cost or deferred income associated with the provision of staff parking places.

It is recommended that SBC adopts a policy of making the grey fleet the option of last resort with the objective of reducing grey fleet use to less than 10% of its current 2015/16 level by 2025/26. This can be achieved through the robust implementation of a Travel Hierarchy and providing easy access to alternatives such as conferencing systems (video, web and audio) in order to avoid unnecessary journeys, pool cars (EVs) for local visits within the Borough and neighbouring authorities, bus passes, travel warrants for trains, pool bikes or e-bikes, and requiring the mandatory use of hire cars for all business journeys that average over 110 miles/day.

The SBC Fleet Challenge was launched on the 22nd June 2017.



SBC Electric Pool Car and Bike

The council have been involved in a number of successful electric vehicle (EV) projects, use of community transport EV cars for school runs, purchase of EV car for Transport and Highways team for highway inspections, the 'My Electric Avenue' project where by nine staff and one Councillor took up the offer of a Nissan Leaf under the “**My Electric Avenue**” project. This project resulted in over 100,000 miles of zero carbon emissions from the tailpipe, as well as significant reductions in particulate and NOx emissions.

The council currently has eleven EVs and six e-bikes on its fleet in 2018/19 with six of these EVs used as pool cars.

The Fleet Challenge programme will enable SBC to:

- Decarbonise its fleet across the estate by increasing the number and use of EV pool cars and other ULEV technologies.
- adopt a travel hierarchy aimed at supporting and encouraging sustainable travel options
- significantly reduce the dependency on the use of grey fleet whilst reducing revenue spend (on mileage claims)
- set out emission specifications with our fleet contracts to reduce emissions



SBC My Electric Avenue

3.6 TAXIS

SBC will:

- **Set minimum emission standards for both Hackney Carriages and private hire vehicles (PHV) that comply with National Clean Air requirements and also promote the use of ultra-low emission vehicles (ULEV)**
- **Install a network of dedicated, rapid charging units to support the growth in ULEV taxi take-up**
- **Encourage the development of SMART APPS for taxi drivers to connect with electric charging infrastructure and for customers to connect to ULEV taxis**
- **Facilitate 'trade' days for taxi drivers to meet with ULEV taxi manufacturers / retailers, infrastructure providers and other support organisations**
- **Promote the use of ULEV taxis for public sector taxi contracts**

3.61 The Government expects local authorities to take a lead and use available powers to reduce vehicle emissions where possible, including controlling emissions from taxis. Taxis operate mainly in the urban area where air pollution is greatest and often leave their engines idling on taxi ranks where members of the public are often exposed.

Additionally, our taxis are the first vehicle that visitors to Slough may use and they can play a major role in normalizing the use of ultra-low emission vehicles (ULEV).

3.62 We are looking at the feasibility of implementing a Clean Air Zones (CAZ) in the Borough (see section 4) that will seek to restrict access, or charge for access, for the most polluting commercial vehicles, whilst also seeking to promote an acceleration in the uptake of ultra-low emission vehicles. In line with the National Air Quality Plan, the introduction of a CAZ will also require minimum emission standards for taxis.

There are over 700 licensed Hackney Carriages (HC) and Private Hire Vehicles (PHV) in Slough.

Table 12 shows the breakdown of the taxi fleet by fuel type (2017).

3.63 Aims of the Slough Taxi Emission Policy

We will seek to set emission standards for taxis. These standards will be progressed through the Taxi Licensing Committee. The Committee will also look at incentives that can be

introduced to promote the uptake of ULEV taxis. The aims of the Slough Taxi Emission Policy are:

- to improve the emission standards of the Slough taxi and private hire fleet to minimum Clean Air Standards as soon as possible
- to require new taxis and PHVs to Slough to be ULEV standard from 2019
- to enable and require all taxis and PHVs to be ULEV standard by 2025
- to encourage early adopters of zero emission capable taxis and PHVs
- to review and adapt our policies to encourage zero emission capable technologies, including vehicle specifications

Table 12 – Slough taxi fleet by European Emission Standard

	Hackney Carriage		Private Hire Vehicle	
	Petrol	Diesel	Petrol	Diesel
<i>Euro 1</i>	0	0	0	0
<i>Euro 2</i>	0	2	0	0
<i>Euro 3</i>	0	13	0	1
<i>Euro 4</i>	2	20	6	33
<i>Euro 5</i>	3	45	18	412
<i>Euro 6</i>	1	16	1	81
<i>Petrol electric hybrid (E 4/5/6)</i>	5	0	84	2
<i>Dual Fuel (petrol/gas)</i>	0	0	1	0

Slough taxi emission policy for new drivers

1. From **1st September 2018** - All new vehicles to be licensed for the first time as a private hire vehicle by a new applicant for a private hire driver licence must be to ultra-low emission vehicle (ULEV) standard.
2. ULEV standard means, a vehicle that uses low carbon technologies and emits less than 75g of CO₂/km from the tailpipe and is capable of operating in zero tailpipe emission mode for a range of at least ten miles.
3. That all vehicles must be under 3 years of age from the date of first registration at the time of first being licensed.
4. Any ULEV standard vehicle once licenced by a new applicant must only be replaced by another ULEV standard vehicle under 3 years of age.
5. New applicants will not be permitted to have a vehicle currently licensed by Slough Borough Council, transferred to them after the effective date, unless the vehicle is of the required ULEV standard and is under 3 years of age from the date of first registration.

Table 13 - Slough taxi emission policy for existing licensed drivers

All Currently licensed vehicles to run their term until 9 Years of age	
Any ULEV to be aged up to maximum of 12 years – for new vehicles only	
Compliance Dates & Emission Standard	Vehicle to be Licensed All Private Hire and Saloon Hackney Carriages
1st September 2019 Clean Air Zone Standard (Euro 6 diesel / Euro 5 petrol) or ULEV	All licensing renewals i.e. renewals of currently licensed vehicles
1st September 2019 Clean Air Zone Standard (Euro 6 diesel / Euro 6 petrol) or ULEV	All new vehicles to be licensed by current licence holders i.e. where the current licensed vehicle needs to be replaced
ULEV from 1st September 2025	All licensing renewals i.e. renewals of current vehicles and all new vehicles to be licensed.

Note – separate standards will be introduced for wheelchair accessible Hackneys following consultation with the trade

3.63 Slough Ultra-Low Emission Taxi Feasibility Study

In 2016, we undertook an **Ultra-Low Emission Taxi Feasibility Study**⁴¹, a pre-requisite for Government funding to support the uptake of ultra-low emission taxis. The study showed that there is interest from the taxi trade in using plug-in vehicles and that at around 3p per mile to run, Slough taxi drivers could achieve significant cost savings by switching from their fossil fuel vehicles.

A key issue is the availability of dedicated rapid charging facilities for taxis. Another is the ability of drivers to charge their vehicles overnight or at the end of their shift.

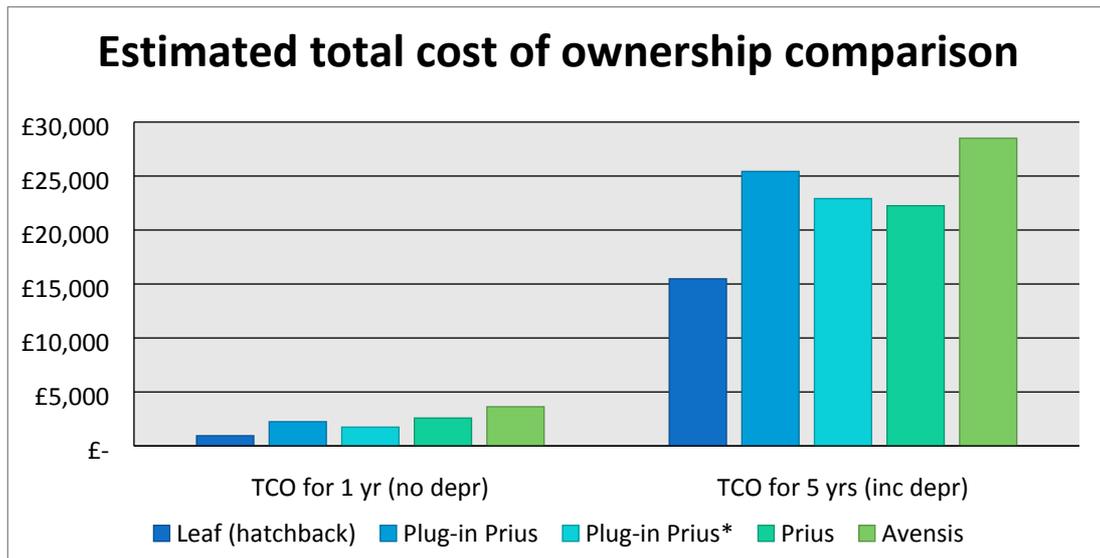
The study used data supplied by Slough taxi drivers to compare the current total cost of ownership (TCO) of running a diesel vehicle compared with a plug-in alternative. It shows that a plug-in, disabled access Hackney could achieve savings of nearly £4,000 per annum,

⁴¹ SBC Ultra Low Emission Taxi Feasibility Study for OLEV (March 2016), LES Ltd/Mint Green Ltd

including vehicle depreciation and an electric PHV could achieve savings of nearly £3,000 per annum compared with a diesel saloon car (see figure 28).

Figure 29 shows examples of disabled access, plug-in taxis entering the market.

Figure 28 – Total Cost of Ownership (TCO) of plug-in, hybrid and diesel vehicles



*denotes driven in mainly electric mode

Figure 29 – Examples of plug-in, disabled access taxis entering the market



Nissan eNV200 electric taxi



Range extended plug-in London Taxi

The Study looked at the projected emission savings of NOx, Particulate Matter and CO2 that could accrue from switching from diesel taxis to plug-in vehicles in Slough. The analysis was broken down by disabled access taxi (black cab) and saloon type taxi (typical PHV) and

looked at low, medium and high take-up of plug-in taxis. Figures 30 and 31 show the projected emissions savings of NOx for black cabs and saloon cars respectively. Figure 32 shows the projected emission savings of CO2e for black cabs.

Figure 30 – NOx emissions (kg) saved by disabled access taxis based on take-up scenarios of plug-in vehicles

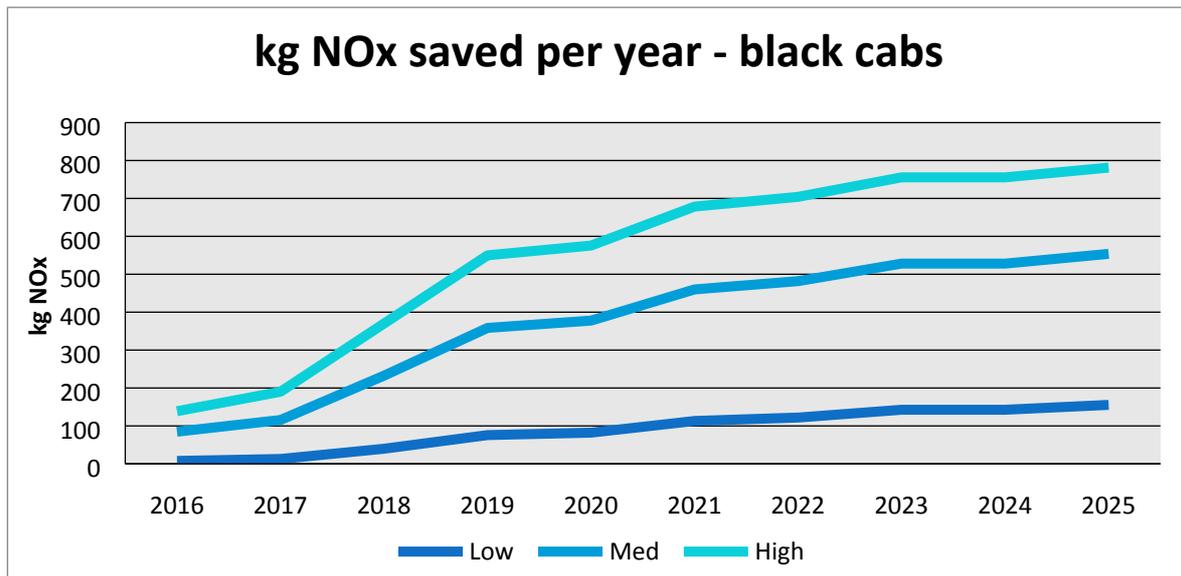


Figure 31 – NOx emissions (kg) saved by saloon car taxis based on take-up scenarios of plug-in vehicles

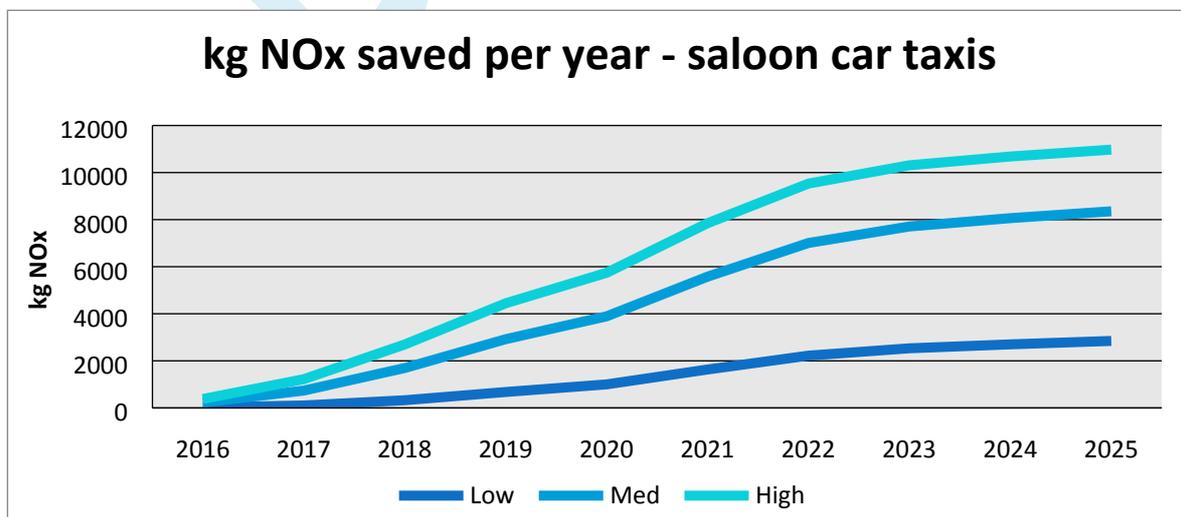
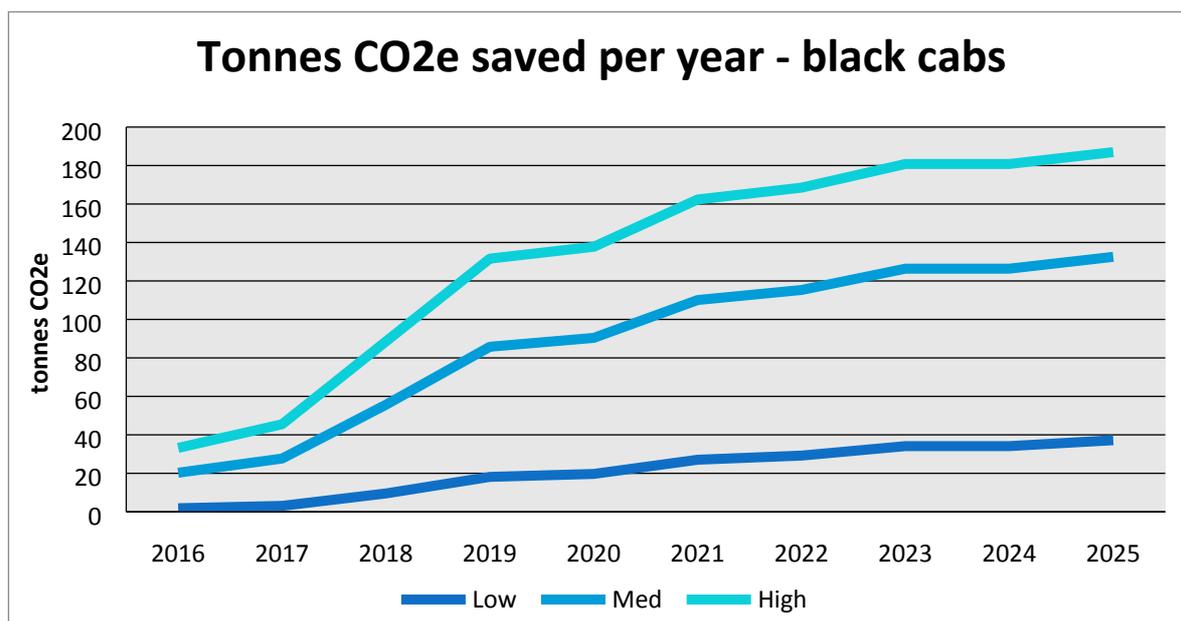


Figure 32 – Carbon Dioxide equivalent emissions (tonnes) saved by disabled access taxis based on take-up scenarios of plug-in vehicles



3.64 Slough Ultra-Low Emission Taxi Funding

Following submission of the **Slough Ultra-Low Emission Taxi Study** to the Government, in March 2017, the Government awarded Slough £157,000 to install 7 rapid charging units for charging taxis. Ultra-Low Emission Taxi Funding was awarded to 9 authorities nationally. These rapid chargers will be rolled out over the next 2 years (2018/20) at the following locations:

- Slough railway station – front entrance
- Slough Railway station – rear entrance
- Harrow Market, Langley
- Burnham Railway station car park
- The Grove car park, town centre
- Burlington car park, town centre
- Church Street, town centre

In order to facilitate a switch to ultra-low emission, plug-in taxis, it is proposed that licensing standards for ULEVs are introduced in line with table 13.

Additionally, incentives to promote the uptake of plug-in taxis will be considered, including:

- Dedicated ULEV taxi ranks at Slough, Burnham and Langley Railway Stations
- Dedicated SMART APP for taxi drivers to book charging facilities
- Discounted charging rates for early adopters
- ULEVs to be prioritised when SBC, and other public services, procure taxi services

SBC will be holding 'Trade' days when taxi drivers can meet with ULEV manufacturers and service providers to discuss opportunities.

The rapid charging unit installed in December 2014 on Brunel Way, opposite the Slough Railway Station taxi rank, currently experiences around 40 charging events per month and increasing at a rate of 100% year on year.



Rapid charging unit on Brunel Way with Slough Station Taxi Rank opposite

3.65 Public and Private Sector Taxi Contracts and Standards

SBC will work with other public and private sector stakeholders to promote the use of ULEV taxis as part of any taxi contract requirements.

4 Slough Clean Air Zone (CAZ) Framework

SBC will:

- Raise awareness of vehicle emissions and benefits of low and ultra-low emission vehicles
- Look at the feasible implementation of a Clean Air Zone (CAZ) in the Borough in consultation with key stakeholders
- Develop and implement the Slough Electric Vehicle Plan
- Work with bus operators to achieve continuing improvements in bus emissions and consider alternatives to diesel technology
- Work with key stakeholders to improve the emissions from freight vehicles
- Implement emission standards for taxis and promote the uptake of ultra-low emission taxis (see section 3.6)
- Lead by example in setting the highest possible emission standards for SBC fleet vehicles (see section 3.4) and reducing emissions from the 'grey' fleet through the Fleet Challenge (see section 3.5)
- Work in partnership with Highways England to reduce the impact of emissions from the M4 motorway

4.1 This section outlines the **Slough Clean Air Zone (CAZ) Framework** which will be delivered by SBC and key stakeholders in line with the **Slough Transport Strategy 2016 – 2036 (draft)**. The CAZ Framework includes low and ultra-low emission vehicle specific measures that are being developed and implemented in Slough to accelerate the uptake of cleaner vehicles, including the provision of infrastructure to support growth. The Framework builds on the policy support mechanisms discussed in Section 3 – Creating a Low Emission Future: Leading by Example, including land-use planning, procurement and licensing measures and provides a delivery framework to support the uptake of low and ultra-low vehicles, including the pursuit of funding opportunities and mechanisms for monitoring and review.

What is a low or ultra-low emission vehicle?

We normally associate vehicles that either meet or go beyond the latest European Emission Standard (Euro Standard – see section 4.2) as achieving the low emission vehicle status. However, some vehicle emissions are far higher under real-world driving conditions than in official tests and this needs to be recognised when promoting emission standards. The Government defines a low emission bus as meeting Euro VI⁴² emission standards while reducing CO₂ emissions by 15% compared with Euro V buses. The Government defines light

⁴² European Emission Standards use normal numbering for light duty vehicles and Roman numerals for heavy duty vehicles

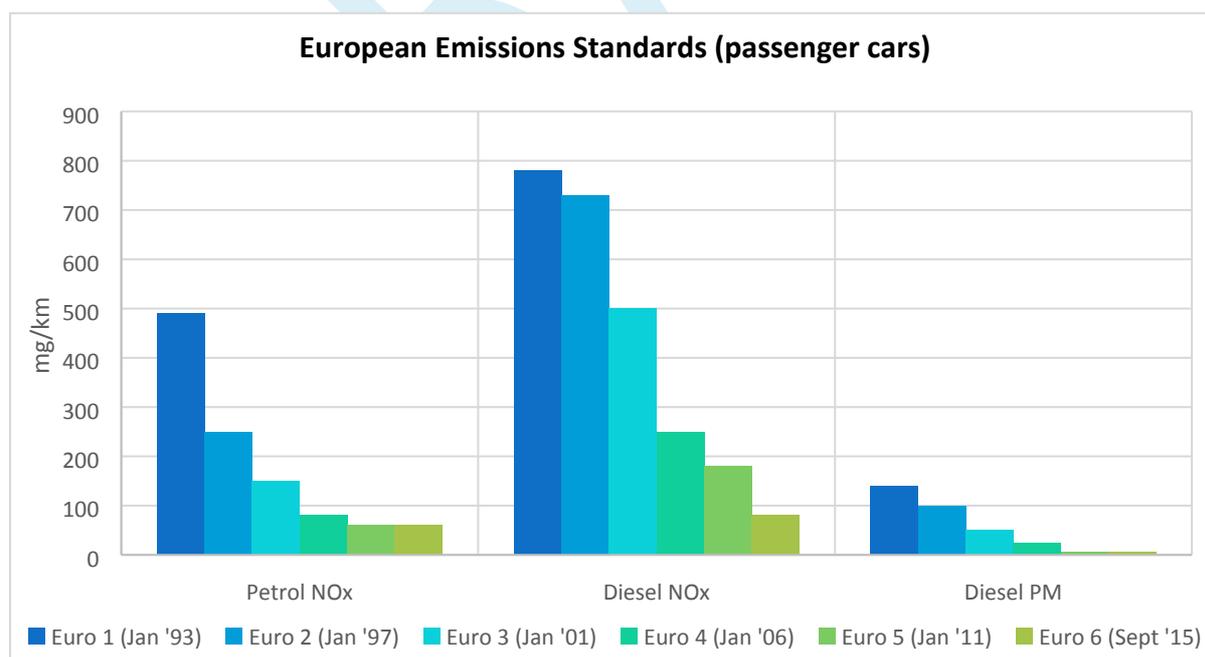
duty vehicles (cars and LGVs) as ultra-low emission if they emit less than 75 g/km of CO₂, irrespective of the Euro Standard.

4.2 European Emission Standards (Euro Standards)

In order for manufactures to sell vehicles within EU Member States they must limit exhaust emissions to a level dictated by the latest Euro Standard, assessed during a standardised test cycle – see table 14. It can be seen that diesel cars emit significantly more NO_x per vehicle than petrol cars. Emissions projections assume the Standards will not be met and there are plans to amend the Euro 6 regulations to use real world testing in the vehicle approval process with the introduction of Euro 6c in 2017 (ICCT 2014⁴³). Euro 6 and 5 diesel cars have had compliance issues especially with the NO_x requirements. Figure 33 illustrates the difference between the test cycle emissions of Euro 5 and 6 diesel cars and their respective real world emissions. Further information on how to identify the real-world emissions of cars and vans can be found in section 4.32.

The European Emission Standards for heavy duty vehicles (buses and lorries) are more stringent for Euro VI vehicles compared with previous standards – see table 15. Evidence suggests that Euro VI vehicles are demonstrating significant improvements under real world driving conditions. Figure 34 shows the results of conformity tests carried out ⁴⁴ on heavy duty vehicles with different Euro Standards, including buses and trucks. Each dot represents a real world test. The ‘conformity factor’ is the ratio of the result to the standard limit, so a value of ‘2’ means the vehicle was emitting twice the amount of NO_x compared with its Euro standard, and any value under ‘1’ would mean it was cleaner than the Euro standard.

Table 14 - European Emissions Standards (passenger cars)



⁴³ <http://www.theicct.org/real-world-exhaust-emissions-modern-diesel-cars>

⁴⁴ “Briefing: Comparison of real-world off-cycle NO_x emissions control in Euro IV, V, and VI”, March 2015, www.theicct.org

Figure 33 - Real World NOx Emissions from Diesel Cars compared with Regulated Limits

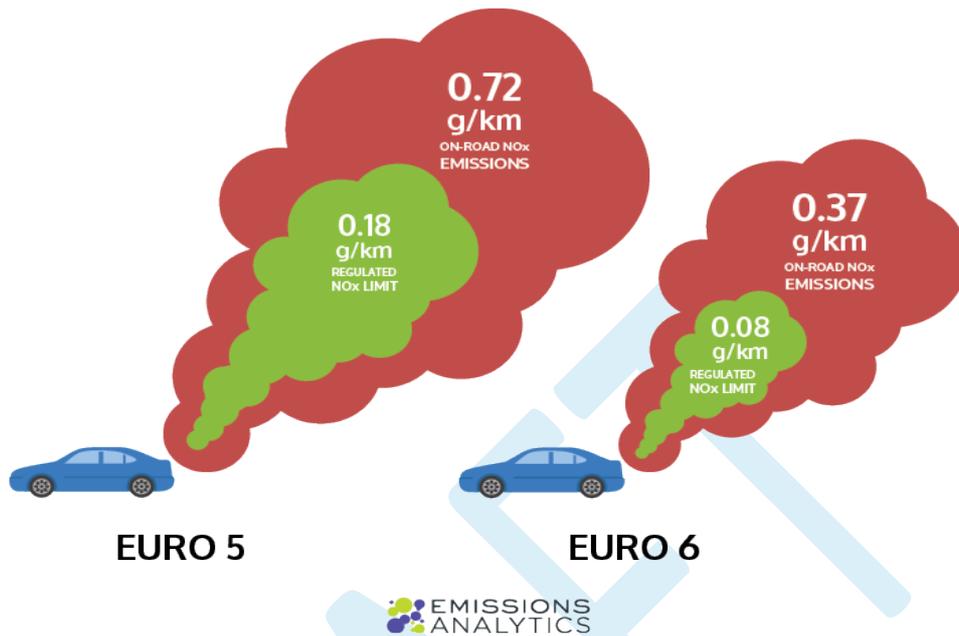


Table 15 – European Emission Standards for Heavy Duty Engines

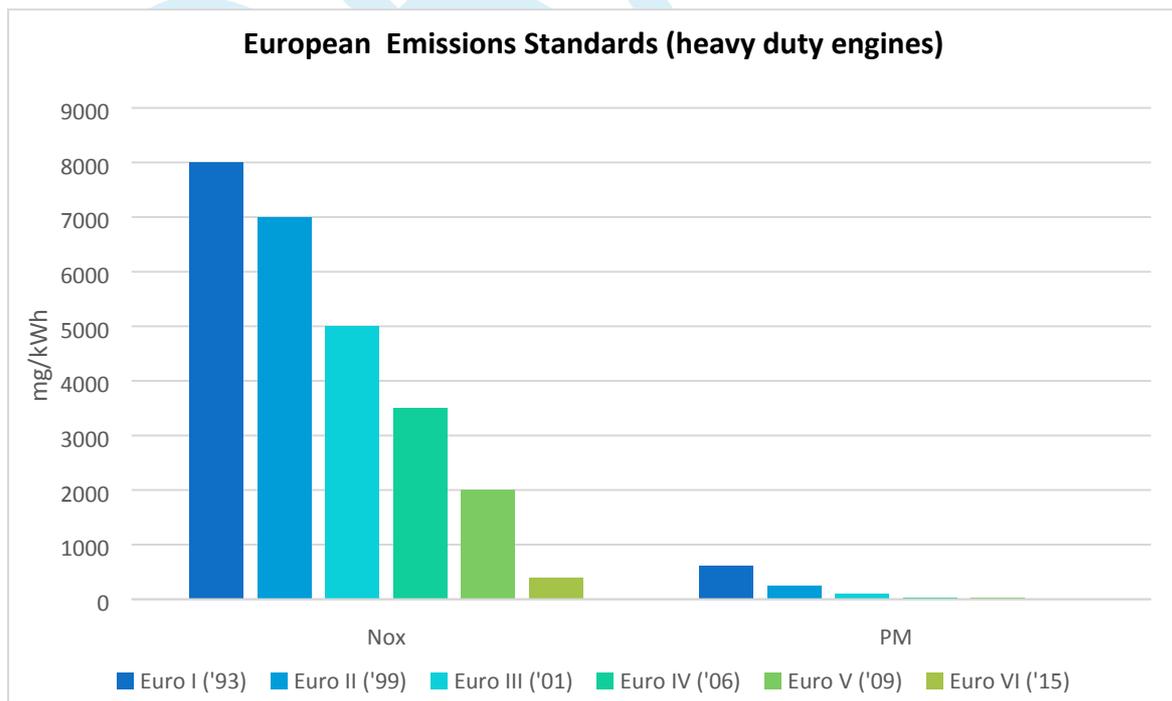
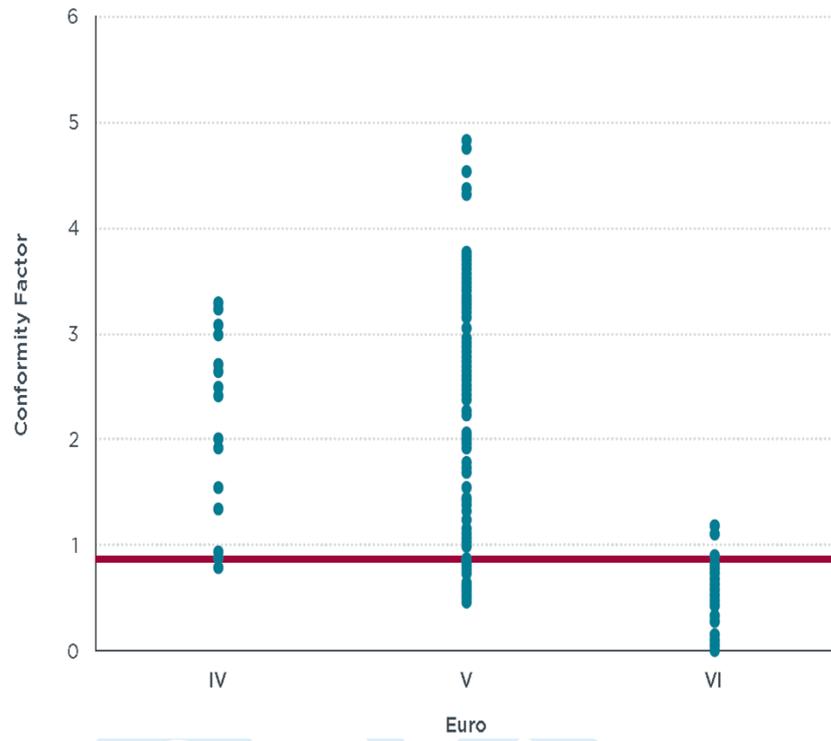
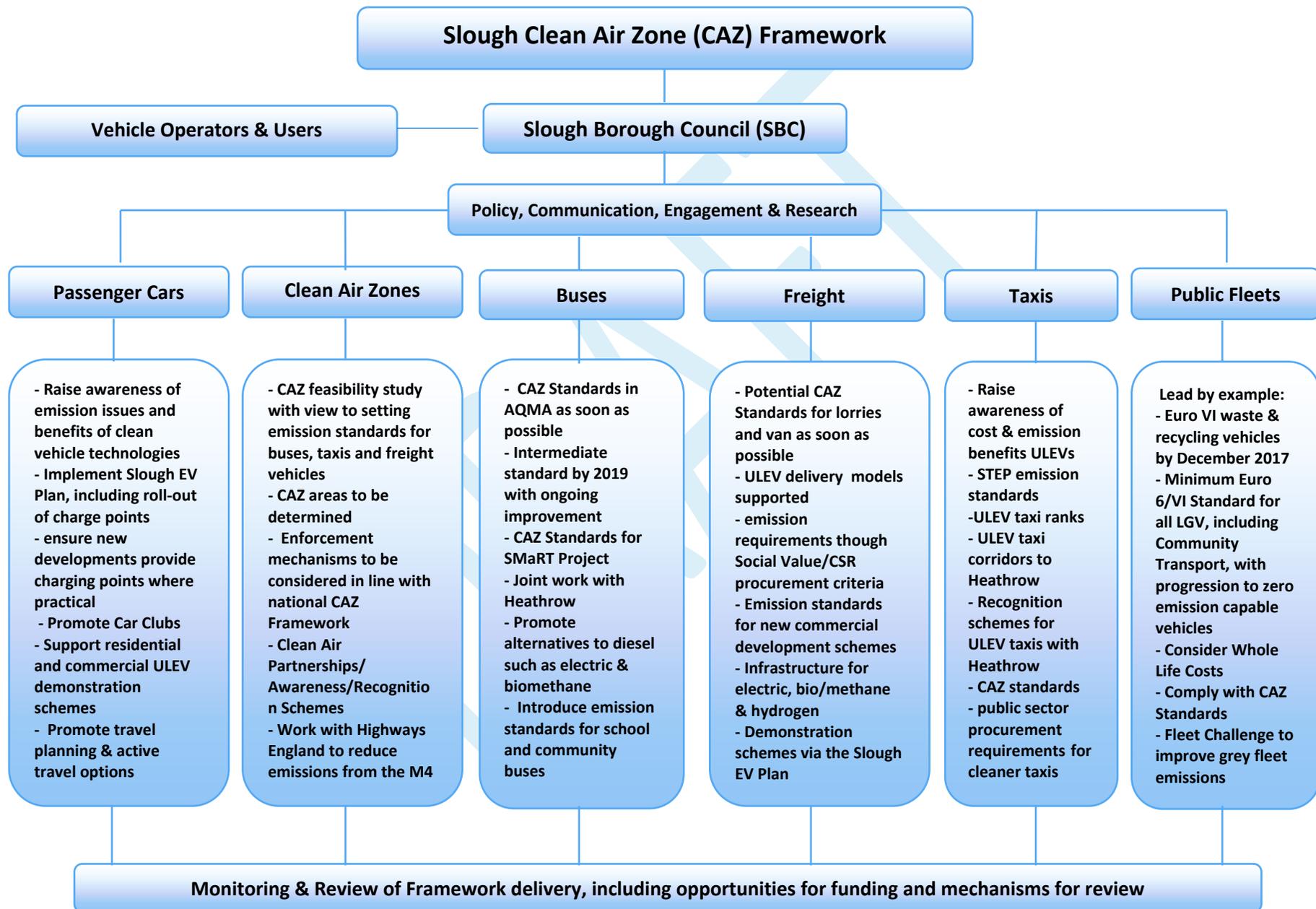


Figure 34 - Performance of heavy duty engines against Euro Standards (ICCT 2015)



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4.3 Passenger Cars

SBC will:

- * **Raise awareness of car emission issues & benefits of alternative fuelled cars**
- * **Promote & support the take-up of ultra low emission vehicles (ULEV) through the development and implementation of the Slough Electric Vehicle Plan**
- * **Ensure new developments provide charging points where practical**
- * **Support residential and commercial ULEV demonstration schemes**

4.31 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% today⁴⁵. Diesel cars have been promoted as environmentally friendly with generally lower vehicle excise duty (VED)⁴⁶, however, not only are Euro Standards for diesel cars less stringent than for petrol cars but they are now known to emit far more NOx under real world driving conditions than their Euro Standard limit. 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 Slough CAZ Framework seeks to raise awareness about the relative emissions of cars and also the total cost of ownership (TCO) of standard technologies compared with alternative fuelled models. Research⁴⁷, shows that over a 3 year period, including depreciation, electric and hybrid models are likely to cost the motorist less to own. As the volume of ULEV manufacture increases, purchase costs are likely to become similar to standard vehicle technologies, meaning that motorists will achieve noticeable cost benefits of buying and running an ULEV.

4.32 How can we know what emissions vehicles produce under real-world driving conditions?

The Mayors of London and Paris are launching an online 'Clean Vehicle Checker' in Autumn 2017. The Clean Vehicle Checker will show consumers how much toxic NOx new cars emit, helping them to choose and buy less polluting vehicles. It will provide an independent evaluation of the emissions of most, new cars and vans on our roads and on the showroom forecourt. By having 'on the road' testing the scheme will help motorists to make an informed choice and incentivise manufacturers to build cleaner vehicles sooner.

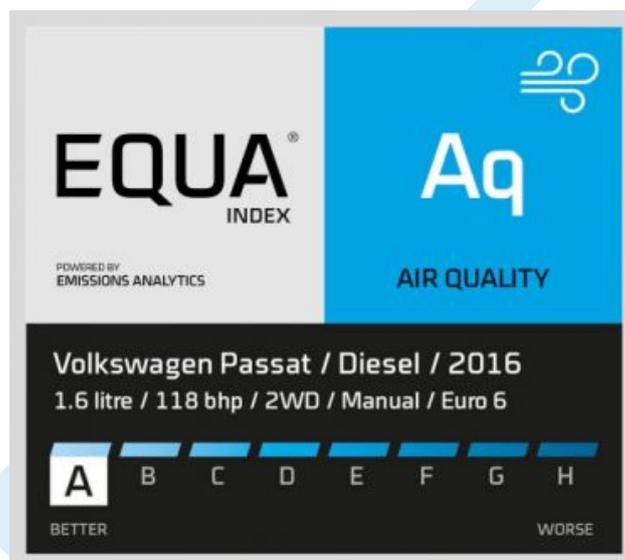
⁴⁵ www.smmmt.co.uk

⁴⁶ <https://www.gov.uk/government/publications/vehicle-excise-duty>

⁴⁷ West Midlands Low Emission Vehicle Strategy (WMLEVS), West Yorkshire Low Emission Strategy (WYLES)

The Clean Vehicle Checker will use real-world emission data provided by Emissions Analytics who have also launched the EQUA Index⁴⁸, which provides free-to-access data on vehicles' fuel consumption and NO_x, CO₂ and CO emissions. In terms of NO_x, vehicles are rated from A to H against their real-world emission performance with A rated vehicles meeting the latest European Emission Standards and H rated vehicles emitting more than 12 times the latest Euro Standards.

Motorists can use these real-world emission tools when making future vehicle purchases. Please refer to the website link <http://equaindex.com/>



⁴⁸ http://equaindex.com/?utm_source=Emissions%20Analytics%20Newsletter&utm_campaign=2d0ac90392-EMAIL_CAMPAIGN_2017_03_31&utm_medium=email&utm_term=0_c35d8b9a1e-2d0ac90392-73487569

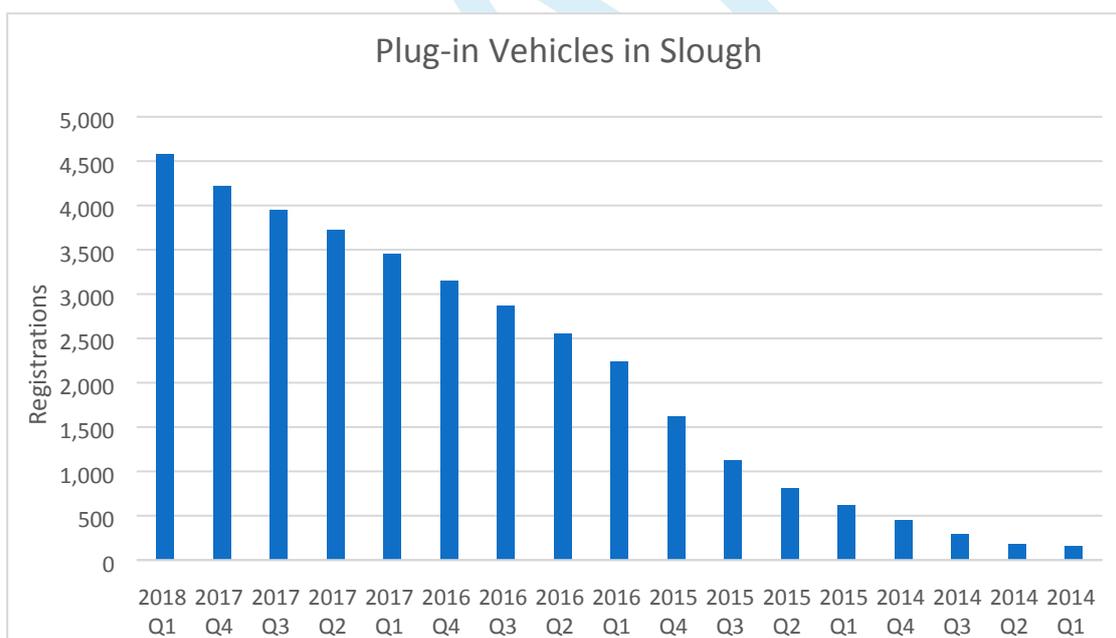
4.4 Slough Electric Vehicle Plan

By the end of the first quarter 2018 there were 141,603 plug-in vehicles registered in the UK, with 14,453 registered in Greater London. Slough has the fourth highest registrations of plug-in vehicles per local authority with 4,577 with data indicating that this exponential growth trend is continuing⁴⁹ (see table 16). The number of plug-in model available is increasing⁵⁰ while costs are reducing.

The Slough CAZ Framework will seek to continue support for the take up of ultra-low emission vehicles (ULEV) with the development and implementation of the **Slough Electric Vehicle Plan** (see section 4.4).

The Government has pledged that almost all new car and light goods vehicle sales will be zero emission by 2050⁵¹ and will continue to provide a grant of up to £4,500 towards the purchase of ultra low emission cars, including plug-in vehicles⁵² and also provide support for rolling out the charging infrastructure needed to enable take-up, including home charging^{53,54}

Table 16 – Quarterly EV registration figures in Slough – Q1 2014 to Q1 2018



⁴⁹ DfT Vehicle Statistics

⁵⁰ <https://www.goultralow.com/>

⁵¹ <https://www.gov.uk/government/news/uk-government-pledges-bold-ambition-for-electric-cars>

⁵² <https://www.gov.uk/plug-in-car-van-grants>

⁵³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515932/electric-vehicle-homecharge-scheme-guidance-for-customers-2015.pdf

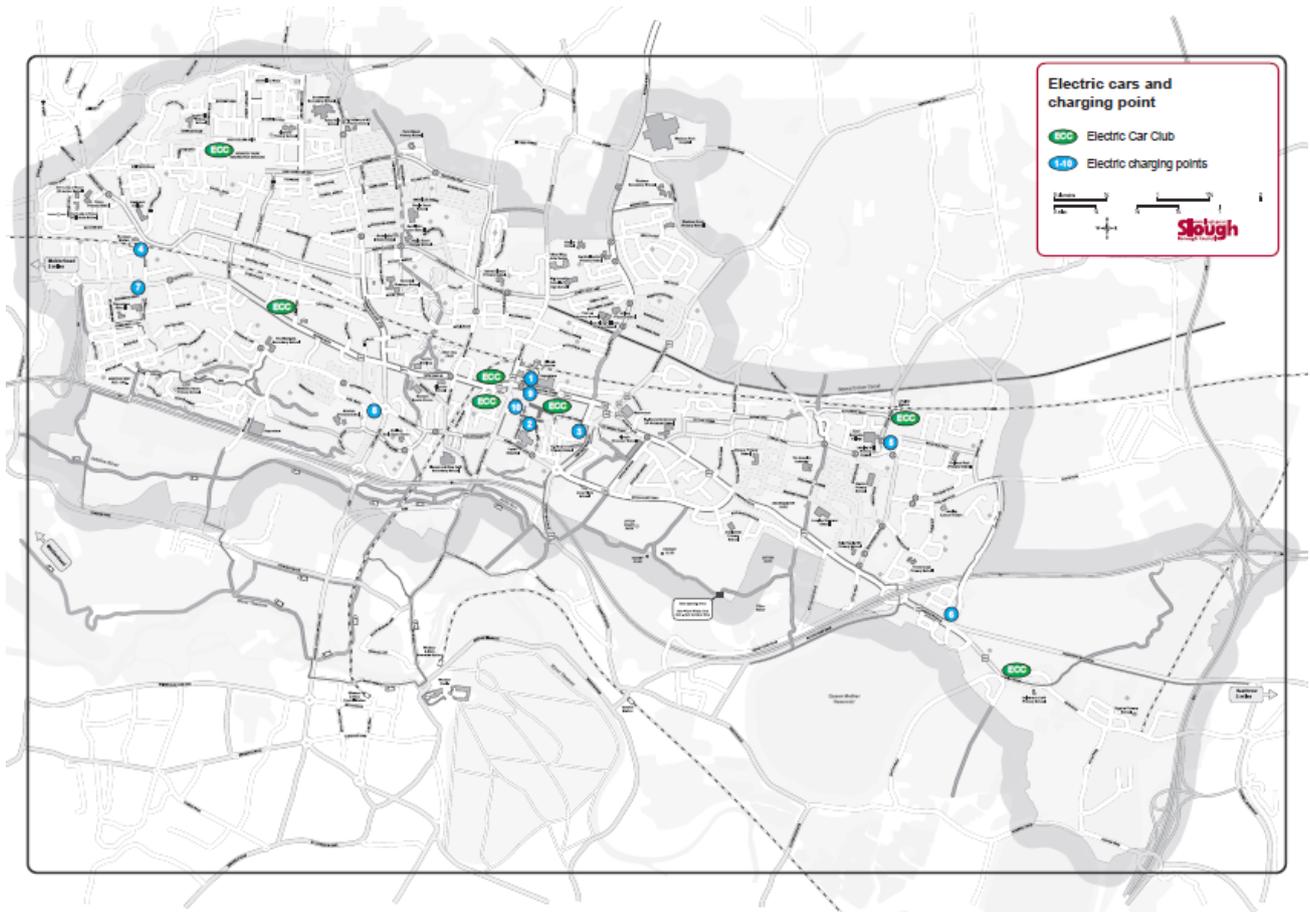
⁵⁴ <https://www.gov.uk/government/publications/workplace-charging-scheme-guidance-for-applicants-installers-and-manufacturers>

In order to promote and support the take-up of ultra-low emission plug-in vehicles, including cars, taxis and commercial vehicles, we will develop and implement a **Slough Electric Vehicle Plan** with the following objectives:



- 1) Support home and workplace charging as the primary charging location utilising the local planning process, business support and private sector investment;
- 2) Creation of a strategic Slough public charge point network that ensures electric car users reach their destination through a simplistic access, usage and payment model (see figure 35);
- 3) Ensure charging opportunities are available for residents with and without private driveways;
- 4) In line with our Air Quality & Planning Guidance (see section 3.3) we will work with developers to provide practical charging solutions and support plug-in vehicle demonstration schemes on new residential and commercial developments;
- 5) Work with bus operators to develop ultra-low emission corridors, including potential for the Slough Mass Rapid Transit (SMaRT) Scheme
- 6) Install a network of rapid charging hubs to facilitate a high growth rate in plug-in taxis and the use of smart technology to link taxi operators with charging infrastructure and customers;
- 7) Develop an Electric Car Club across the Borough
- 8) Link and compliment with a potential Ultra-Low Emission Zone at Heathrow
- 9) Tackle the perceived and actual barriers to EV ownership through targeted marketing, promotion and information;
- 10) Work with the Thames Valley Berkshire Local Enterprise Partnership⁵⁵ to help businesses achieve resource efficiency savings and to attract investment in ULEV technology and infrastructure;
- 11) Deliver an exemplary public sector ULEV operation – demonstrating to employees, business and the wider community the benefits and savings of ULEV vehicles and related air quality improvements through the SBC Fleet Challenge;
- 12) Seek opportunities for small-scale renewable energy generation to power ULEVs and two-way energy delivery from ULEVs to power homes when appropriate, reducing domestic bills and energy demands on the national grid;
- 13) Support the freight industry to invest in ULEV vehicles, especially in relation to last-mile delivery operations and help with infrastructure installation where possible.

⁵⁵ <http://thamesvalleyberkshire.co.uk>



Map of current and proposed electric vehicle charge-points and proposed electric car club locations. All the Low Emission Programme Infrastructure Maps can be found on the SBC LES webpage - <http://www.slough.gov.uk/pests-pollution-and-food-hygiene/low-emission-strategy-2018-2025.aspx>

4.5 Clean Air Zones (CAZ)

SBC will:

- Undertake a feasibility assessment, including stakeholder consultation, for implementing CAZ, in line with the national Clean Air Zone Framework
- Ensure that any CAZ links and compliments with any Ultra-Low Emission Zone (ULEZ) at Heathrow
- Promote any CAZ through Clean Air Partnerships, Clean Air Awareness and Recognition Schemes

In July 2017, the Government published its 'UK plan for tackling roadside nitrogen dioxide concentrations'⁵⁶. The Plan sets out an approach for meeting these goals by implementing a programme of Clean Air Zones in line with a national **Clean Air Zone Framework**⁵⁷.

As a minimum any Clean Air Zone is expected to:

- be in response to a clearly defined air quality problem, seek to address and continually improve it, and ensure this is understood locally;
- have signs in place along major access routes to clearly delineate the zone;
- be identified in local strategies including (but not limited to) local land use plans and policies and local transport plans at the earliest opportunity to ensure consistency with local ambition;
- provide active support for ultra low emission vehicle (ULEV) take up through facilitating their use;
- include a programme of awareness raising and data sharing;
- include local authorities taking a lead in terms of their own and contractor vehicle operations and procurement in line with this framework;
- ensure bus, taxi and private hire vehicle emission standards (where they do not already) are improved to meet Clean Air Zone standards using licensing, franchising or partnership approaches as appropriate; and
- support healthy, active travel.

We will undertake a feasibility study in 2019/20 which will address the issues above and also include widespread consultation with key stakeholders. It is proposed that the study will look at the feasibility of implementing 'charging' or 'non-charging' CAZ in the Borough.

We will look at the feasibility of implementing a Class B or C CAZ (see table 17) where the emission standards applied are shown in table 18. Existing powers may be used to set emission standards for buses and taxis, while automatic number plate recognition cameras (ANPR) could be used to

⁵⁶ <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

⁵⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/612592/clean-air-zone-framework.pdf

identify CAZ compliance of lorries and vans, whereby non-compliant lorries and vans would be subject to a daily charge set by the Government.

As part of the process of implementing a CAZ in Slough, SBC will be:

- working with SMEs and other businesses to help them understand their options for adapting to a Clean Air Zone, and the support available to them.
- engaging business participation in environmental sustainability and training programmes, for example to improve driver behaviour, and campaigns to raise employee awareness.
- working with local employers to increase awareness in their staff about local public transport choices and alternatives, and initiatives such as car clubs and car sharing.
- encouraging businesses to commit to use only their cleanest vehicles in a Clean Air Zone.
- encouraging businesses to commit, when buying new vehicles, to purchase those in line with or higher than Clean Air Zone standards.
- encouraging businesses to adopt approaches to operations that can support a Clean Air Zone.
- encouraging large taxi or private hire users, such as universities and hospitals, to require ultra low emission vehicles within their contracts and promote travel planning to minimise use.
- encouraging the uptake of low and ultra-low emission business recognition schemes
- encouraging delivery service plans with local businesses and public sector organisations.

Should the study clearly demonstrate that it is necessary, feasible and economically viable to implement a ‘charging’ CAZ in Slough, SBC will make an application to the Secretary of State for the powers to introduce a ‘charging’ CAZ by 2021. SBC has the ability to implement a ‘non-charging’ CAZ without the need for prior approval from the Secretary of State.

Table 17 - Clean Air Zone Classes

Clean Air Zone class	Vehicles included
A	Buses, coaches and taxis (including private hire)
B	Buses, coaches, taxis and heavy goods vehicles (HGVs)
C	Buses, coaches, taxis, HGVs and light goods vehicles (LGVs)
D	Buses, coaches, taxis, HGVs, LGVs and cars

Table 18 - Clean Air Zone emission standards for vehicle types

Vehicle type	NOx emissions limit
Bus/coaches	Euro VI
HGV	Euro VI
Car/light commercial (up to 1305kg)	Euro 6 (diesel) Euro 4 (petrol)

4.6 Buses

SBC will:

- Work in partnership with bus and coach operators to identify an emission reduction pathway to 2025
- Require a minimum Euro VI emission standard for new, tendered commercial bus route services through Slough from 2018
- Require a minimum Euro VI Standard for all existing commercial bus routes operating in our AQMAs by 2021
- Undertake an electric bus route trial
- Support, where possible, funding opportunities to reduce emissions
- Promote ultra-low emission buses through the Slough Electric Vehicle Plan
- Promote ultra-low emission corridors as part of the Slough Mass Rapid Transit (SMaRT) and Heathrow developments
- Promote alternatives to heavy diesel such as methane/biomethane and electric

4.61 We recognize the vital role that public transport plays in our everyday lives and buses provide efficient transport modes and an alternative to private vehicle use and potential for reducing congestion. We also understand that older buses can cause significant emissions.

Tables 19 and 20 show the relative emissions of buses, by Euro Standard, travelling at urban speeds. It can be seen that Euro V buses tend to emit more NO_x than Euro IV buses due to the ineffective operation of their NO_x catalysts not working properly at low speeds when the exhaust temperature is insufficient. This can be addressed by fitting thermal management technology.

Table 21 illustrates the green house gas emissions of diesel and alternative fuelled buses.

Table 19 - NO_x emissions of buses by Euro Standard and fuel type

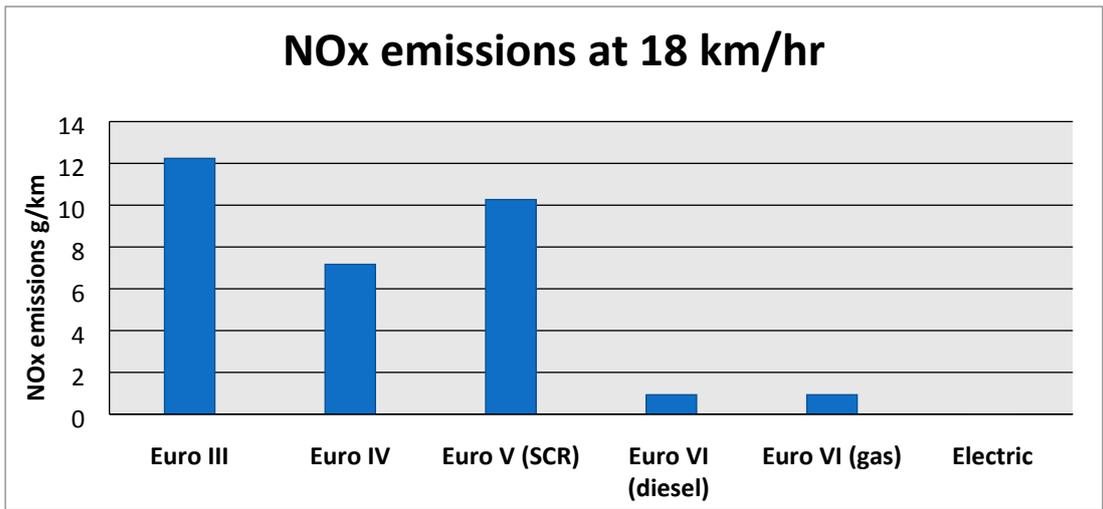


Table 20 – PM emissions of buses by Euro Standard and fuel type

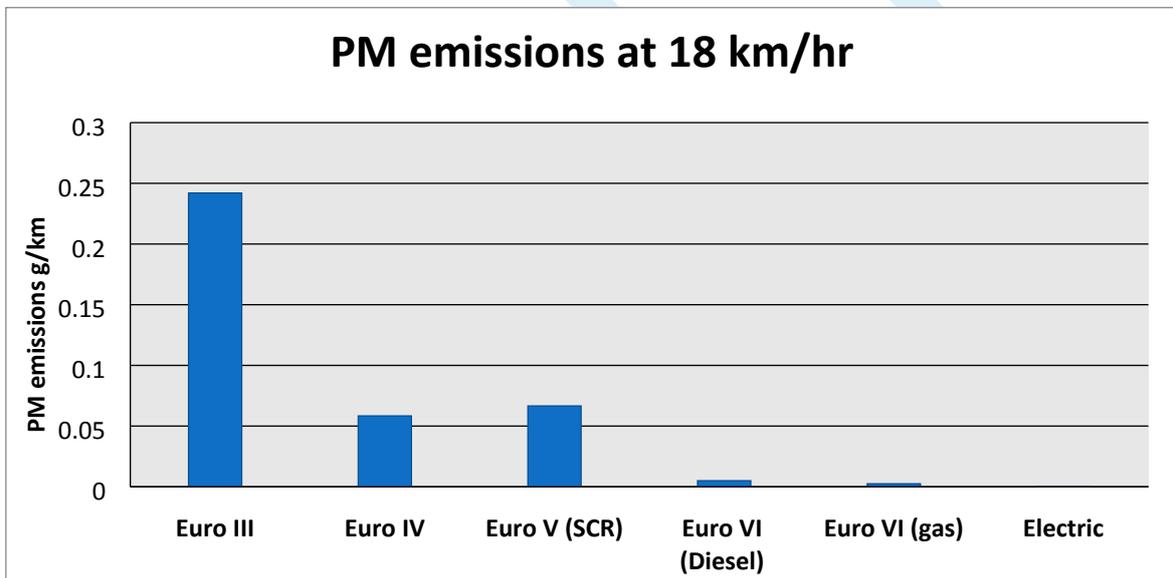
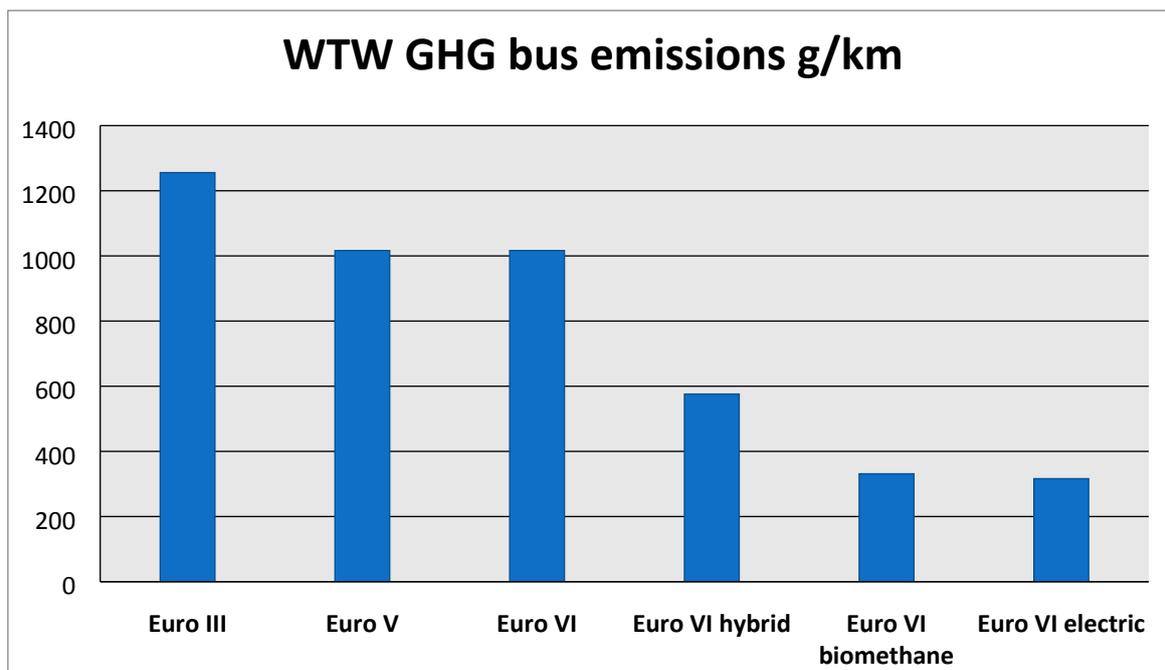


Table 21 – Green House Gas (Well to Wheel) emissions of buses by Euro Standard and fuel type⁵⁸

⁵⁸ Euro VI hybrid figures are for the Volvo full hybrid, LowCVP 2016



4.62 Emission Standards for Buses

Many bus operators will look to run a bus for at least 15 years on commercial routes meaning that that around 7% of the bus fleet is replaced each year under normal circumstances. While the newest buses (Euro VI) are showing significant emission reductions over previous Euro Standards, the natural turnover of the bus fleet will be insufficient to tackle air quality issues in the short to medium term.

It is acknowledged that bus operators cascade buses around the country according to operational needs, including the introduction of emission standards. Further pressures are faced by the bus operators in seeking to comply with CAZ standards that are being introduced around the country, requiring the use of Euro VI buses, which may restrict the ability of bus companies to invest in the cleanest buses in non-CAZ areas. We will be consulting with all local bus and coach operators as part of the Slough CAZ feasibility study. We believe it is feasible to set an emission target of Euro VI for local bus services operating through our AQMA by 2021.

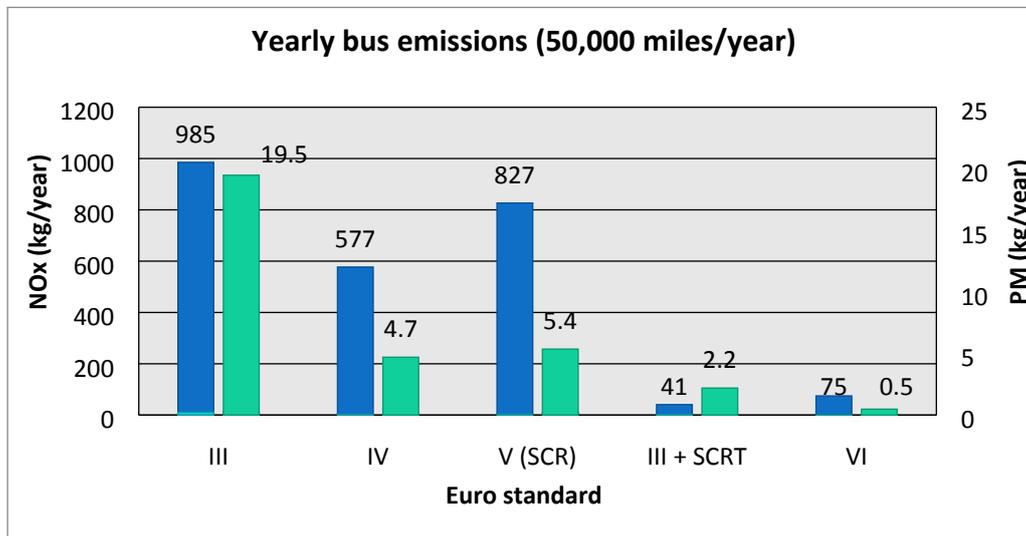
Retrofitting of existing buses

Table 22 shows the yearly emissions of a bus per Euro Standard, including the real-world emissions of a Euro III bus retrofitted with selective catalytic reduction technology (SCRT). We believe it is feasible for bus operators to cost effectively reduce the emissions of older buses, including Euro IV and V, by using retrofit technology that is approved under the Clean Vehicle Retrofit Accreditation Scheme (CVRAS)⁵⁹

⁵⁹<http://www.energysavingtrust.org.uk/transport/clean-vehicle-retrofit-accreditation-scheme-cvras>

Further emission improvements may be required if it is feasible to introduce a CAZ in Slough. SBC will look at best technology as part of the **Slough Mass Rapid Transit (SMaRT)** scheme, which will require a Euro VI Standard from the outset.

Table 22 – Retrofit (SCRT) emission reductions for NOx and PM per bus



3.63 Ultra-low Emission Pathways

While we will continue to work with bus operators to progressively reduce harmful emissions from buses we will also seek to promote the green house gas benefits of moving away from diesel to alternatively fuelled buses such as biomethane and electric technologies.

We will build on the experience of other towns and cities in supporting diesel alternatives. Biomethane buses have been successfully rolled out in Sunderland, Darlington, Reading, Beccles, Runcorn and Bristol and both Bristol and Nottingham, 2 of the 4 Ultra Low Emission Cities in the UK have plans for significant growth in biomethane buses.

Cities such as London, Nottingham, Milton Keynes and Coventry have successfully introduced electric buses. While the capital cost of these buses is higher than standard diesel buses, there can be significant fuel and maintenance savings provide overall savings to operators. The benefits of both these technologies are highlighted below:

Biomethane Buses



ADL/Scania, Nottingham

- Runs on compressed gas
- Spark ignition engine
- Very high GHG savings & very low PM emissions
- No range limitation
- Filling station required, economies of scale favour larger projects
- Significant operational savings

Electric Buses



Milton Keynes

- All electric operation
- Zero tailpipe emissions
- Limited range – more suited to urban routes
- Operational savings
- Choice of infrastructure – overnight charging to inductive and/or rapid charging

4.7 Freight

SBC will:

- * Look at the feasible implementation of CAZ standards for lorries and vans in the Borough
- * Promote ULEV deliveries through Social Value / Corporate Social Responsibility (CSR) procurement criteria and delivery service plans
- * Work with Highways England to support vehicle emission reductions for freight vehicles interacting with the M4 and the Slough road transport network
- * Look at infrastructure to support ultra-low emission freight through the Slough Electric Vehicle Plan
- * Recommend emission standards for new commercial developments
- * Promote alternative fuelling facilities such as gas & biomethane
- * Support ULEV freight demonstration schemes

4.71 Freight transport is a key aspect of the Slough road transport network and contributes to the local economy. Slough is home to the largest private industrial estate in Europe (Slough Industrial Estate).

Heavy goods vehicle (HGV) mileage driven in Slough In 2016 is at similar levels to 2000, however, light goods vehicle (LGV eg. vans) mileage has increase by almost a third over the same period due to the growth in dot.com / home delivery businesses⁶⁰.

While HGV emissions for the latest, Euro VI, vehicles are demonstrating significant emission improvements over previous Euro Standards (see figure 34), there has been an underestimation of the emissions caused by vans, with the latest Euro Standard vehicles only recently entering the market.

Many commercial fleet operators have strategies in place to reduce emissions through their corporate social responsibility (CSR) agendas and due to high annual mileages, many blue chip companies will keep their HGVs for only 3 to 5 years⁶¹ meaning that the cleanest, Euro VI HGVs already provide a significant share of the total HGV fleet.

Several freight companies have been successfully trialling natural gas and biomethane as an alternative to diesel. With more dedicated gas trucks entering the market, companies have found that there are significant operational cost savings from using gas and reductions in the emissions of both air pollutants and noise. John Lewis Partnership has stated that within 7 years their trunking fleet will be entirely gas⁶². The Government has set a reduced fuel duty rate for methane and biomethane until 2024 and also permits the emission savings from using biomethane to be included in CSR reporting. However, further work is needed to expand the refueling infrastructure available.



Gas refueling, John Lewis Partnership 2017

⁶⁰ <http://www.dft.gov.uk/traffic-counts/area.php?region=South+East&la=Slough>

⁶¹ Freight Transport Association (FTA)

⁶² Presentation, ADBA, 2017

Many organizations are finding that the use of plug-in car derived vans can be cost effective, however, while there are several gas alternatives available in the LGV market, the availability of plug-in LGV models is still limited and needs encouragement to grow this market.

4.72 SBC will work in partnership with the freight industry to reduce vehicle emissions where feasible, including:

- Assess the feasibility of introducing a CAZ in the Borough for lorries and vans
- Seeking opportunities to increase the take-up of alternative fuels and technologies by HGV and LGV operators by supporting projects for alternative refueling infrastructure such as natural gas and biomethane.
- Promote electric delivery vehicles and infrastructure through the Slough Electric Vehicle Plan
- Promote sustainable emission criteria in public sector purchasing decisions
- Using the Air Quality & Planning Technical Guidance to ensure new commercial developments incorporate facilities for ultra-low emission vehicles, such as electric charging points and minimum Euro emission standards for fleet vehicles
- Working with Highways England to support freight emission reduction initiatives
- Working with commercial fleet operators to use whole-life costing during vehicle procurement to promote the economic as well as environmental and health benefits from low emission HGVs and LGVs.
- Work with freight organizations to look at alternatives to diesel powered refrigeration units
- Encourage both the public and private sector to consider freight vehicle movements through Delivery Service Plans.
- Look at HGV routing to avoid AQMAs
- Encourage more freight to be transported by rail for long-haul journeys.

4.8 M4 Motorway

4.81 Highways England is the government company charged with operating, maintaining and improving England's motorways and major A roads ('the Strategic Road Network') including the M4 motorway. Through the Road Investment Strategy, the UK government has allocated a ringfenced £100 million for an Air Quality Fund available through to 2021 for Highways England to help improve air quality on its network. This is to meet the dual vision of the Road Investment Strategy of not only protecting the environment but also improving it, including air quality.

4.82 SBC has designated an AQMA along the M4 corridor and will be working in partnership with Highways England to implement measures to reduce the impact of emissions from the motorway traffic on the affected communities.

4.9 Low Emission Programme

4.91 SBC has started planning for the infrastructure that we need to fulfil our ambitions. We have developed a draft **Slough Low Emission Programme** that seeks to enable a high take-up of ULEVs and zero emission capable alternatives to owning a vehicle, through the provision of necessary infrastructure.

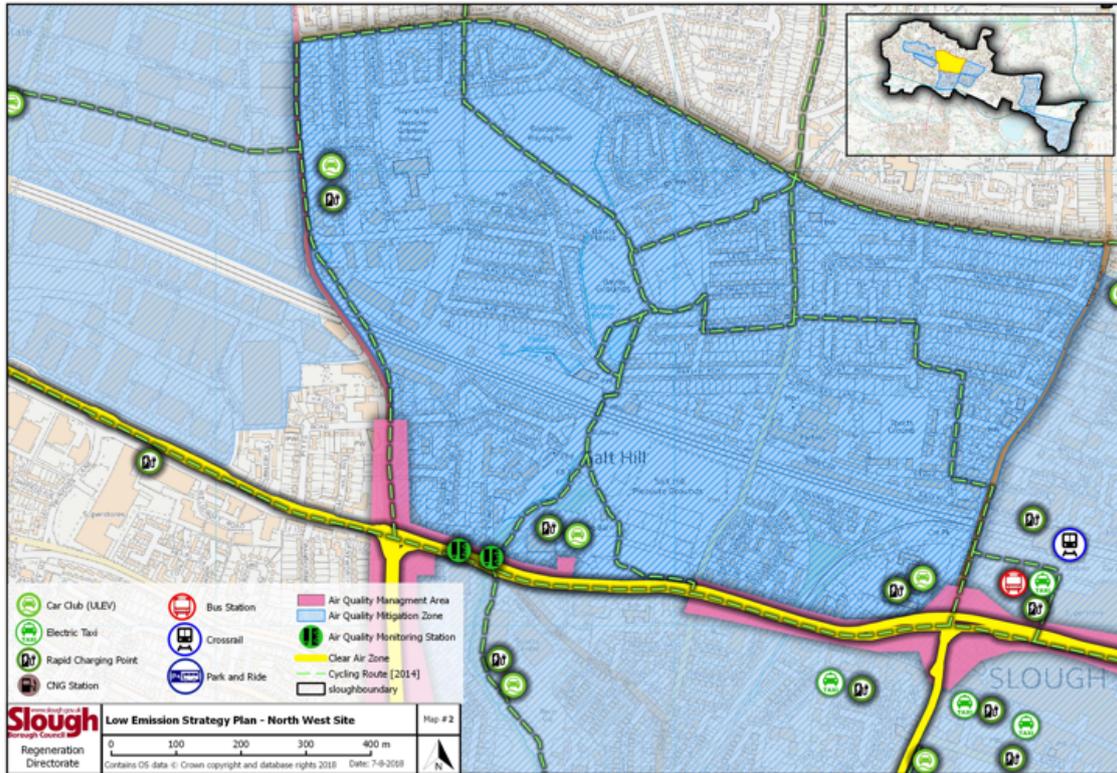
The programme is designed to be fluid to accommodate opportunities for expansion and will be funded through a mixture of our own budget, grant funding opportunities, local enterprise partnership (LEP) and funding from planning obligations on major schemes. The programme seeks to align with the **Government's Industrial Strategy – Road to Zero**⁶³.

The Low Emission Programme is split into 7 sectors of Slough, covering the AQMA. The North-West Sector map is shown below. All maps of the Low Emission Programme can be found on the SBC Low Emission Strategy webpage⁶⁴

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⁶³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/724391/road-to-zero.pdf

⁶⁴ <http://www.slough.gov.uk/pests-pollution-and-food-hygiene/low-emission-strategy-2018-2025.aspx>



Low Emission Programme – North West Sector

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5 Delivery & Communications Plan

SBC will:

- Produce an integrated Delivery Plan as part of the final LES, identifying key roles and responsibilities and timescales
- Produce an up to date Air Quality Action Plan (AQAP) for all Slough AQMAs by 2019
- Produce an effective Communication Plan in partnership with Public Health to promote key messages and measures in the LES
- Monitor the implementation of measures and their success based on appropriate 'success' criteria
- Review the measures in the LES on an annual basis
- Keep apprised of current and upcoming funding opportunities to support LES

5.1 Delivery Plan

As part of the final LES, SBC will develop and implement a detailed **Delivery Plan**, outlining key roles and responsibilities for delivering measures and the timescales for delivery.

We will also update our Air Quality Action Plan (AQAP) by 2019 to cover all Slough AQMA and include specific low emission measures outlined in the LES within the update AQAP.

5.2 Communication Plan

5.21 SBC believe that it is essential to raise awareness of the impacts of air pollution, including vehicle emissions, on health and also measures that can help reduce emissions and improve air quality. In partnership with Public health we will produce a **Communication Plan** to accompany the LES, highlighting key messages and measures that will be delivered. The Communication Plan will be informed by guidance on this issue, including NICE Guidelines – '*Air pollution: outdoor air quality and health*'⁶⁵ and DEFRA guidance – '*Air Quality: A Briefing for Directors of Public Health*'⁶⁶.

5.22 Enabling SBC to adopt a robust and effective local approach that will complement the national strategy from the government is the key aim of the communication plan.

The communication plan will focus on both short term and immediate messaging for peaks in air pollution, as well as longer term engagement strategies to amalgamate the local community. It will also tie in with key local and national campaigns which both directly and indirectly lead to a reduction in congestion and emissions. For example nation walk to work day, cycle to work day, Slough half marathon and national clean air day.

⁶⁵ <https://www.nice.org.uk/guidance/ng70/chapter/Recommendations#awareness-raising>

⁶⁶ <https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf>

As part of the customer facing communication work we will also be integrating an air quality section to the new Slough Public Health 'One You' website. This page will serve to be the community facing source of information for everything to do with air quality. This will include key facts and information, alerts, downloadable resources and campaign related information. It can also be used to inform vehicle users of the measures they can take to reduce their emissions by travel planning and vehicle choice.

Short term and immediate public health messages will enable the public to reduce their personal exposure by avoiding areas of higher pollution; this is beneficial for the general population and those with existing health conditions. Examples of successful implementation of health communication include air quality services such as airTEXT, airALERT and 'Know and Respond'. All of these services provide free information about the quality of outdoor air they breathe. The consideration of measures that foster awareness of the effects of air pollution in the local population can enable local residents to make informed decisions on how to reduce their exposure and if required, to better manage their health conditions.

The communication plan within the Slough strategy will follow the six principles for public communication about air pollution based on qualitative research in 2013 for Defra.

- A. Explaining what air pollution is:** Using information about what particulate matter and other air pollutants are made of and where they can go to get air pollution onto the local agenda – not statistics about health consequences.
- B. Helping people understand how they can protect themselves:** Without raising public concern about air pollution unless there is clear and ample information to satisfy people's desire to do something to reduce their exposure.
- C. Explaining the health impacts:** Focusing on what is known for certain about the health consequences of air pollution.
- D. Making it local:** Talking about air pollution as a problem linked to specific places within Slough, not just as a general problem of the atmosphere.
- E. Explaining how individuals can make a difference:** Keeping the focus on practical improvements – not long-term solutions.
- F. Demonstrating leadership and empower communities,** instead of simply expecting individuals to change their behaviour. Utilising the council, as an exemplar organisation to support others to follow in our steps.

We will also investigate the potential of running a **Clean Air Recognition Scheme** to help amalgamate local groups, organisations and businesses. This scheme will allow us to recognise and reward positive local community efforts of improving air quality and reducing emissions. It will also enable us to provide technical support and advice and provide a measure to gauge their efforts and impact.

This strategic partnership approach to the communication plan will prove vital when attempting to reach the widest audience possible. These local groups, organisations and businesses have an important role to play by introducing incentives for staff to walk or cycle to work, take up car

sharing or work from home, or spreading key messages within the community. This element could form a Clean Air Partnership for Slough.

Everyone will need to take some action if we are to significantly improve air quality. While the impact of the individual household or business may be small, the combined impact of actions taken by the local authority, large and small businesses and individuals could be great.

5.3 Monitoring & Review

The LES details policies and measures that will be implemented up until 2025. As part of the Delivery Plan we will develop 'success criteria' which will be used to monitor and measure progress on delivering the LES. This information and any changes in our understanding of air quality and health, national policy and legislation and effective emission reduction mechanisms will be used to review the LES at appropriate intervals and update the LES accordingly.

5.4 Funding Opportunities

SBC will 'horizon scan' in partnership with key stakeholders to identify suitable funding opportunities that will help support the delivery of the LES.

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Glossary of Terms

AQMA	-	Air Quality Management Area
AQAP	-	Air Quality Action Plan
CAZ	-	Clean Air Zone
CDV	-	Car derived van
CO ₂	-	Carbon Dioxide
CVTF	-	Clean Vehicle Technology Fund
DEFRA	-	Department for the Environment, Food and Rural Affairs
DfT	-	Department for Transport
DPF	-	Diesel Particulate Filter
EEV	-	Environmentally Enhanced Vehicle
EU	-	European Union
Euro Standard	-	European Emission Standard
FTA	-	Freight Transport Association
HC	-	Hackney Carriage
HDV	-	Heavy Duty Vehicle ie bus or lorry
HGV	-	Heavy Goods Vehicle ie lorry
LES	-	Low Emission Strategy
LEZ	-	Low Emission Zone
LGV	-	Light Goods Vehicle
NHS	-	National Health Service
NICE	-	National Institute for Clinical Excellence
NO ₂	-	Nitrogen Dioxide
NO _x	-	Oxides of Nitrogen ie a mixture of Nitrogen Dioxide, Nitric Oxide and Nitrous Oxide
NRMM	-	Non-road mobile machinery
OLEV	-	Office for Low Emission Vehicles
PHE	-	Public Health England
PHV	-	Private Hire vehicle
PM	-	Particulate Matter
PM ₁₀	-	Particulate Matter less than 10 microns in size
PM _{2.5}	-	Particulate Matter less than 2.5 microns in size
RCV	-	Refuse Collection Vehicle
RHA	-	Road Haulage Association
SCRT	-	Selective Catalytic Reduction Technology
TCO	-	Total Cost of Ownership
ug/m ³	-	micrograms per metre cubed
ULEV	-	Ultra Low Emission Vehicle ie below 75 g/km CO ₂
ULEZ	-	Ultra Low Emission Zone
WHO	-	World Health Organisation
WLC	-	Whole Life Costs