



Epping Forest Interim Air Pollution Mitigation Strategy:

Managing the Effects of Air Pollution on the Epping Forest Special Area of Conservation

December 2020

1. Introduction

- 1.1 Large parts of the Epping Forest have been designated as a Special Area of Conservation (SAC) because of the significance of its ecological features (known as 'qualifying features'), specifically its beech forest, wet and dry heaths and population of stag beetle. SACs are international designations and have the highest level of protection afforded to them through UK legislation and Government policy. It is known that much of the Epping Forest SAC is in an unfavourable condition.
- 1.2 Under UK legislation Epping Forest District Council (the Council) is a competent authority with a duty to ensure that plans and projects, including the emerging Epping Forest District Local Plan 2011-2033 (the emerging Local Plan) which is at an advanced stage of preparation), have no adverse effect on the integrity of the Epping Forest SAC either alone, or in combination with other plans and projects. This includes not doing anything that would prevent the Epping Forest SAC from achieving the conservation objectives identified for it. As part of that responsibility the Council, as local planning authority, is required to undertake a Habitats Regulations Assessment (HRA) of the emerging Local Plan.
- 1.3 This Strategy has been developed to provide a strategic approach to mitigating the effects of development on the integrity of the Epping Forest SAC in relation to atmospheric pollution. It has been developed to support the implementation of policies contained within the emerging Local Plan and specifically policies DM2 and DM22. In doing so it reflects the evidence base (the evidence) developed to support the HRA process. This Strategy will therefore support the conclusion of the Local Plan HRA process and facilitate the determination of individual planning applications which have the potential to have an adverse effect on the integrity of the Epping Forest SAC in relation to atmospheric pollution without mitigation.
- 1.4 It is clear from the evidence that without appropriate mitigation development proposed through the emerging Local Plan, in combination with other plans and projects, would have an adverse effect on the integrity of the Epping Forest SAC as a result of atmospheric pollution. A key contributor to that atmospheric pollution arises from vehicles.
- 1.5 The Epping Forest SAC is bisected by a number of roads which serve communities in Epping Forest District and beyond. We know, having undertaken detailed traffic modelling, that new development, primarily for housing and employment, will result in increases in traffic on those roads. This traffic modelling has been used to inform air quality modelling, the outputs of which show that over the period of the emerging Local Plan (covering the period up to 2033), if no mitigation measures are introduced, air pollution arising from vehicles will have further harmful effects on the health of the qualifying features within the Epping Forest SAC compared to a situation with no growth. It is important to recognise that whilst vehicles are a contributing factor, there are other activities that are also having an adverse impact on the ecological health of the Epping Forest SAC. Appendix 1 to this Strategy

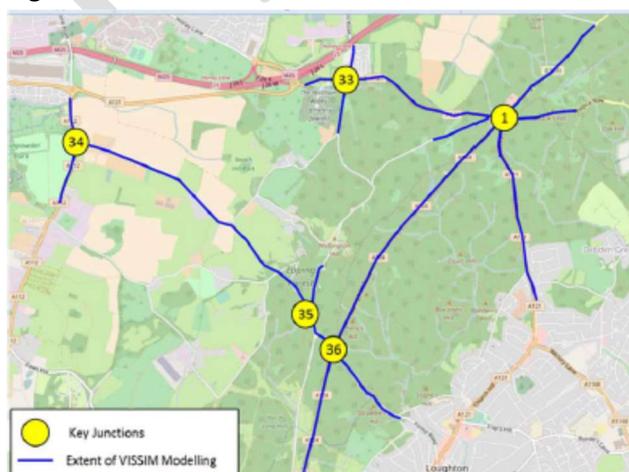
identifies a number of actions that the Council could take to reduce the contribution that these activities have on the Epping Forest SAC.

- 1.6 This Strategy has been developed in response to the findings of the evidence base by setting out a suite of mitigation measures that are needed to address the effects of atmospheric pollution arising primarily from new development proposed to be brought forward within the District. It is therefore an important part of the evidence base that supports the emerging Local Plan. The Strategy also sets out how these mitigation measures will be implemented and how the efficacy of those mitigation measures will be monitored and reviewed.

2. The evidence base

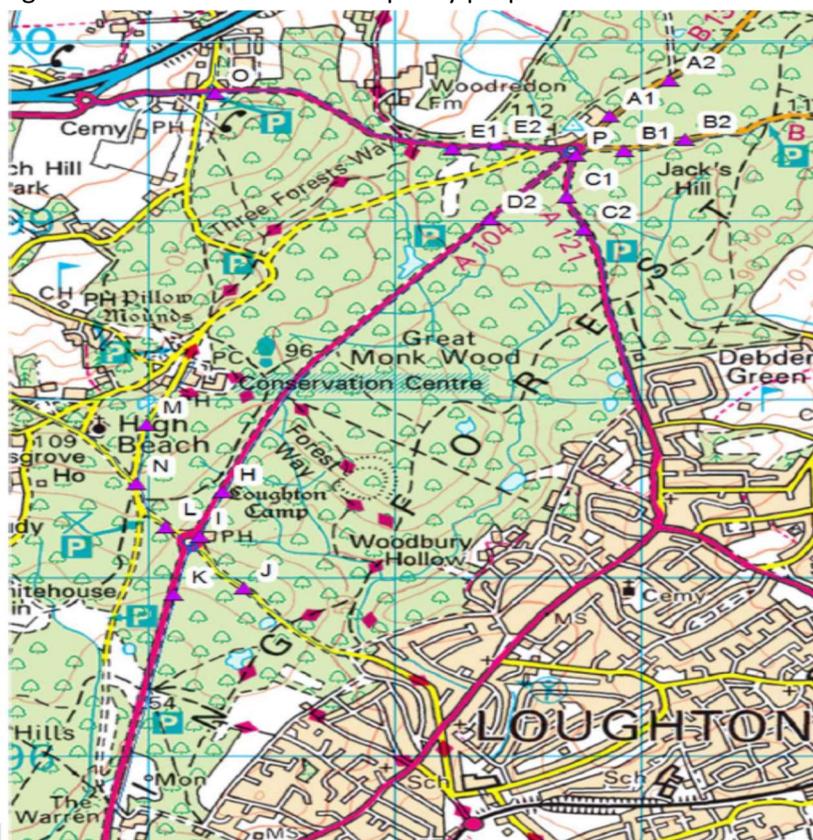
- 2.1 To support an understanding of the likely significant effects of the emerging Local Plan on the Epping Forest SAC bespoke traffic and air quality modelling has been undertaken based on observed data and on-site monitoring. As such a robust approach has been undertaken to understanding the issues arising from development within Epping Forest District (EFD). The technical notes explaining the methodology undertaken and the results used to inform the development of this Strategy and the emerging HRA can be viewed here (*insert link*).
- 2.2 The predicted change in vehicle flows and mean maximum queue length and duration was modelled on a series of roads in close proximity to the Epping Forest SAC. This took account of all expected growth over the plan period, including Local Plan development and extant planning permissions, background traffic growth arising from development in surrounding local authority areas (including extant planning permissions) and predicted background growth in traffic generally as derived by national traffic growth projections. The level of growth applied within EFD arising from the emerging Local Plan has had regard to the advice note of the Inspector examining the emerging Local Plan dated 2 August 2019.
- 2.3 The roads were selected in consultation with the Conservators of Epping Forest and were considered to be those most likely to experience the greatest change in flows (and therefore impact) due to the proposed housing and employment growth within and outwith the District for the period to 2033. The modelled network is shown in Figure 1 below.

Figure 1: The modelled road links



2.4 Using the generated traffic scenarios, information on the vehicle fleet mix, average vehicle speeds and queue lengths (all of which influence the emissions profile), air quality specialists calculated expected concentrations, for oxides of nitrogen and ammonia as well as nitrogen deposition rates for the modelled links. For some road sections (particularly around Wake Arms Roundabout) multiple transects were modelled in order to capture the effects of queuing traffic. The modelled links are depicted in Figure 2 below.

Figure 2: Links modelled for air quality purposes



3. The Issue

3.1 The main pollutants of concern for European sites are oxides of nitrogen (NO_x), ammonia (NH₃) and sulphur dioxide (SO₂). Ammonia can also have a direct toxic effect upon vegetation and research suggests that this may also be true for NO_x at high concentrations or in the presence of equivalent amounts of sulphur dioxide. In particular, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to vegetation and soils. An increase in the deposition of nitrogen from the atmosphere is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats. Ammonia and nitrogen can also have a serious deleterious effect on lichens which take their nutrients directly from the atmosphere.

Table 1: Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on Habitats and Species
Acid Deposition	SO ₂ , NO _x and ammonia all contribute to acid deposition. Although future trends in SO ₂ emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is possible that increased ammonia emissions may cancel out any gains produced by reduced SO ₂ levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH ₃)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Vehicles fitted with catalytic convertors, such as petrol cars, are also a known source of ammonia. Ammonia reacts with acid pollutants such as the products of SO ₂ and NO _x emissions to produce fine ammonium (NH ₄ ⁺) - containing aerosol which may be transferred much longer distances (can therefore be a significant transboundary issue.)	Adverse effects are as a result of direct toxicity and from nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH ₃ is rapidly deposited, some of the most acute problems of NH ₃ deposition are for close to the roadside or close to point sources in intensive agricultural landscapes.
Nitrogen oxides (NO _x)	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO ₃), nitrogen dioxide (NO ₂) and nitric acid (HNO ₃) can lead to both soil and freshwater acidification. In addition, NO _x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO _x and NH ₃ emissions. These pollutants cause acidification (see also acid	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species

	deposition) as well as eutrophication.	which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Sulphur Dioxide (SO ₂)	Main sources of SO ₂ emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO ₂ emissions have decreased substantially in the UK since the 1980s – UK emissions in 2018 decreased by 96% relative to 1990, below the 2020 NECD and Gothenburg emission targets ¹ .	Wet and dry deposition of SO ₂ acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils

3.2 The Epping Forest SAC is known to be adversely affected by relatively poor local air quality alongside the roads that run through it and this has been demonstrated to have negatively affected the epiphytic lichen communities of the woodland. The nature of the road network around the modelled part of the Epping Forest SAC is such that journeys between a number of key settlements around the Forest by car, van, lorry or bus effectively need to use roads that bisect the Epping Forest SAC. Moreover, queues are known to build up around most arms of the Wake Arms Roundabout, primarily during the AM and PM peak, which increases emissions compared to the same volume and composition of free-flowing traffic.

3.3 As such, emissions from road traffic have been the focus of the air quality modelling. Regulations control the sulphur content of fuel used by vehicles, therefore emissions of SO₂ have not been assessed. Emissions of NO_x from road traffic are decreasing due to the implementation of tighter European type approval standards (Euro Standards). However, ammonia is produced by the control systems that are designed to reduce emissions of NO_x from road traffic vehicles. Emissions of ammonia are greater from petrol than from diesel cars, whilst the converse is generally the case for NO_x. The critical levels for NO_x and ammonia and the critical load for nitrogen deposition are set out below:

Pollutant	Critical Level	Critical Load
Oxides of nitrogen (NO _x)	30 micrograms per cubic metre (30µgm ⁻³)	N/A
Ammonia (NH ₃)	1 microgram per cubic metre (1µgm ⁻³)	N/A
Nitrogen deposition	N/A	10-20 kilograms of nitrogen per hectare per year (10 kg N/ha/yr)

¹ UK Informative Inventory Report (1990 to 2018) - https://uk-air.defra.gov.uk/assets/documents/reports/cat07/2003131327_GB_IIR_2020_v1.0.pdf

- 3.4 The plan showing the Transects that have been modelled are set out in Figure 2 above. The evidence shows that the contributions of NO_x, ammonia and nitrogen deposition at the roadside represent a risk to the qualifying features for which the Epping Forest SAC has been designated.
- 3.5 The outputs of modelling undertaken showed that growth in Epping Forest District up to 2033 (i.e. the end of the Local Plan period) is the primary source of additional ammonia and NO_x emissions on the modelled road sections and all other plans and projects would appear to make a negligible contribution to the 'in combination' effect. This is thought to be because the average daily traffic flow on all the modelled sections of road is dominated by people who either live or work in Epping Forest District, particularly the settlements that surround the Epping Forest SAC, including Epping itself.
- 3.6 The evidence demonstrates that the effects of Local Plan development on air quality on the Forest will require mitigation measures to be implemented. Some of the required measures will not only help to avoid adverse impacts of development on the Epping Forest SAC, but also support objectives including responding to the climate change crisis, managing the effects of growth on the highway network and supporting healthy lifestyles.
- 3.7 The measures contained within this Strategy will be secured through a number of mechanisms including:
- the use of planning conditions and/or legal agreements to secure financial contributions for the implementation of off-site measures as part of the determination of planning and other development related applications;
 - the development of strategic Masterplans; and
 - strategic initiatives to be implemented by the Council and its partners.
- 3.8 The policy context against which planning and other development related applications will be assessed in relation to addressing atmospheric pollution is set out in Section 4 below. In particular policies DM2 and DM22 provide the Framework by which the effects on the Epping Forest SAC will be mitigated to such an extent that an adverse effect on site integrity can be avoided. The measures relied upon to avoid adverse effects to the Epping Forest will be secured through the implementation of this Strategy, which identifies a number of measures that will be need to be delivered over the course of the Local Plan period. Appendix 3 to this strategy provides a summary of the measures that will be delivered, how they will be delivered, and when.
- 3.9 There are other actions the Council can take, outside of the planning regime, which can also support the management of air quality both across the District and within the Epping Forest SAC. These are set out in Appendix 1 to this strategy. Consequently, this Air Pollution Mitigation Strategy brings together all of the proposed approaches to support the improvement of air quality in the District. Whilst this is primarily to avoid any adverse effects on the integrity of the Epping Forest Special Area of Conservation, it will also have wider benefits including in relation to peoples' health.

4. Planning Policy Framework

- 4.1 The following policies within the emerging Local Plan are of relevance to achieving, either directly or indirectly, a positive contribution to atmospheric improvements.

Policy SP1 Spatial Development Strategy

- 4.2 Policy SP1 sets out the sequential approach to the location of development with a focus on locations which have access to existing infrastructure, or where there is the greatest opportunity to provide additional infrastructure capacity, including in order to secure a modal shift away from the use of the private car. Both traffic modelling and Habitats Regulations Assessments were used to inform the approach taken. In addition, the allocation of a number of strategic employment sites in locations where new homes are also proposed provides the greatest opportunity to provide an alternative to the private car in terms of journey choice and therefore reduce the harmful effects that traffic emissions have on both ecological and human health.

Policy DM2 Epping Forest SAC and the Lee Valley SPA

- 4.3 Policy DM 2 sets out the Council's expectations that all relevant development proposals assist in the conservation and enhancement of the biodiversity, character, appearance and landscape setting of the Epping Forest SAC. It contains specific reference to a number of Strategies, including this Strategy, adopted by the Council as a material consideration in the determination of planning applications to ensure that any adverse effects on the integrity of the Epping Forest SAC are avoided. This is a main policy to which this Strategy is linked.

Policy DM22 Air Quality:

- 4.4 This policy seeks to ensure that both the residents and ecological assets of the District, including the Epping Forest SAC, are protected from the impacts of atmospheric pollution. The policy and supporting text to Policy DM22 includes a policy link to Policy DM2 and is therefore also a main policy to which this Strategy is linked.

Policy T1 Sustainable Transport Choices.

- 4.5 This policy sets out the Council's commitment to:
- achieve improvements to strategic rail connections and other public transport networks to the wider area;
 - promote transport choice through improvements to public transport services and supporting infrastructure;
 - provide coherent and direct cycling and walking networks to provide a genuine alternative to the car;
 - facilitate a modal shift and to promote opportunities for sustainable transport modes; and
 - secure the provision of electric vehicle charging points in all new development which includes vehicle parking spaces.

4.6 The implementation of Policy T1 is one of the ways in which reductions in atmospheric pollution across the District will be achieved. The supporting text to Policy T1 of the emerging Local Plan explains that the sustainable transport policies seek to widen the choice of travel opportunities using public transport, walking and cycling. It states that the emerging Local Plan will ensure the provision of facilities and services in new strategic developments to provide high levels of self-containment and secure the provision of, or financial support for, bus services and walking and cycling facilities. The supporting text explains that such an approach can be expected to have a wider benefit as it can also provide access to new transport opportunities for existing residents, thus reducing increases in background traffic growth and reiterates that the Council will require the provision of electric vehicle charging points in all new development which includes vehicle parking spaces. These requirements are also included within relevant site-specific policies in Chapter 5 and Part 2 to the emerging Local Plan.

4.7 The policy requirement for the provision of electric vehicle charging points in all new developments regardless of their proposed use which include the provision of new parking spaces has two benefits:

- it ensures that developments can support the growth in electric vehicles without the need to retrofit such provision in the future; and
- it provides confidence for people who have not purchased electric vehicles that they can do so because they can access the necessary infrastructure now.

Development proposals will need to be able to demonstrate that all new parking spaces can have direct access to a charging point.

4.8 The Council's Epping Forest District Cycle Action Plan provides a range of specific proposals for improving the cycling infrastructure across the District. The Council's Infrastructure Delivery Plan identifies all of these projects and sets out how these should be funded through the planning process.

Policy DM5: Green and Blue Infrastructure

4.9 This policy provides the framework within which the Council has developed a Green and Blue Infrastructure (GI) Strategy. The GI Strategy supports the provision of suitable alternative natural greenspace, which serve as an interceptor for visitor trips, a large proportion of which are made by private car, as well as improvements to, and provision of new, walking and cycling connections to support sustainable transport choices.

Policy DM 21: Local Environmental Impacts, Pollution and Land Contamination.

4.10 This is a positive development management policy relating to environmental impact, pollution and land contamination. It is a positive policy as it provides for the prevention of detrimental impacts as a result of environmental conditions resulting from new development such as air quality, and provides for the reuse and recycling of building materials and the use of local products, thus reducing atmospheric pollutants further, and the use of water resources during the manufacturing process. Whilst traffic is the main contributor to atmospheric pollution issues there are other generators of air pollution that

need to be considered and which will support, albeit only by a small amount, positive improvements to air quality.

Policy D5: Communications Infrastructure.

- 4.11 This is a development management policy relating to communications infrastructure. It is a positive policy which ensures that developments make provision for high speed internet and telecommunications. This supports the potential to reduce the need to travel, particularly during the morning and evening peak hours and will therefore make a positive contribution to reducing atmospheric pollution.

Site-specific policies

- 4.12 The emerging Local Plan includes a number of site-specific policies which will support the management of, and improvements to, air quality. The site-specific policies vary depending on the scale of development proposed. The Garden Communities and Strategic Masterplan sites in particular provide a key role in reducing the use of private passenger vehicles including through:
- the delivery of strong local cultural, recreational, social (including health and educational facilities where required), local employment and shopping facilities to support the day-to-day needs of residents which are within walkable distance – the ‘self-sufficiency’ principle.
 - The provision of sustainable movement and access to local and strategic destinations (including by rail, bus and walking/cycling).
 - The provision of generous, well connected and biodiverse rich green space provision so that residents do not have to travel by car to be able to access natural green space.
- 4.13 These site-specific requirements are key to ensuring the provision of infrastructure to support the achievement of a reduction in private car use. In particular there are significant opportunities to secure such infrastructure on the strategic masterplan sites. These larger sites also provide the opportunity to ensure that community infrastructure and services and local employment opportunities (such as education and health provision, local facilities and services, and open space) are integrated as part of the design of development. This will provide opportunities to minimise the use of the private car. These sites will also be supported by the provision of new passenger transport services. Such provision could provide wider benefits to existing residents and businesses where current passenger transport services are limited or non-existent.

5 What we need to achieve by 2033 and how we will get there.

- 5.1 There is a need for the Council, as competent authority, to not only provide the planning policy framework which ensures that the measures needed to protect the Epping Forest SAC are secured, but also identify the specific mitigation measures that need to be delivered based on the current evidence and in accordance with the requirements of the Habitats Regulations.

5.2 The evidence base modelled a number of scenarios which assessed future development growth in the District 'in combination' with other plans and projects (i.e. the Local Plan plus growth in surrounding authorities). A number of potential measures were initially considered, including the implementation of a Clean Air Zone encompassing the roads within close proximity to the Epping Forest SAC and the closure of roads to HGVs. In addition consideration was given to what beneficial effects a shift from Large Goods Vehicles (LGVs) to Ultra Low Emission Vehicles (ULEVs or simply newer Euro standards) would have. Ultimately, two approaches were selected as being quantifiable in the air quality modelling and the most likely to be sufficiently effective in order to be able to reach a conclusion of no adverse effect on the integrity of the Epping Forest SAC. These were as follows:

1. The introduction of a Clean Air Zone; and
2. Increasing the percentage of the vehicle fleet that constitutes ULEVs to 12-15% by 2033, with a focus on the conversion of petrol cars (these being a major source of ammonia) to ULEVs (e.g. electric cars).

5.3 The evidence base provides a detailed understanding of the air pollution context in 2033 and what needs to be done in order to reach a conclusion of no adverse effect on the integrity of the SAC as a result of new development. This understanding was based on modelling the following:

- A minimum 10% conversion of petrol cars to ULEVs by 2025, in other words, 4-5% of the Epping Forest SAC vehicle fleet to be ULEVs by this year;
- The introduction of a Clean Air Zone from 2025;
- A minimum 20% conversion of petrol cars to ULEVs by 2029; (8-10% of the Epping Forest vehicle fleet to be ULEVs by this year); and
- A minimum 30% conversion of petrol cars to ULEVs by 2033 (12-15% of the Epping Forest SAC vehicle fleet being ULEVs by this year)

The evidence demonstrates that the conversion of petrol cars to ULEVs and the introduction of a Clean Air Zone (CAZ) in 2025 would ensure that planned development would not interfere with the ability of the Epping Forest SAC to achieve its conservation objectives with regard to Nitrogen Deposition, or ammonia and NO_x concentrations.

5.4 There are other measures which would also have a beneficial role in achieving an improvement in air quality within the Epping Forest SAC and beyond. Consequently the measures identified within this section are all considered to be necessary to achieve the primary objective of the delivery of development not adversely affecting the integrity of the Epping Forest SAC. Regular on site air quality and traffic monitoring are also key elements of this Strategy so that we can use data which is specific to the Epping Forest SAC to help us understand the effectiveness of the measures identified in this Strategy or if we need to look at other approaches. The approach to monitoring is set out in Section 6 of this Strategy. The outputs will be used to inform the requirement to regularly review the Local Plan and in particular the indicators set out in Policy D8 of the emerging Local Plan. It is also important that this Strategy is reviewed, and if necessary, updated on a regular basis. In part this is to

ensure that it is achieving its objective of improving air quality across the Epping Forest SAC but will also enable consideration to be given to new technologies and other approaches that may emerge in the future. The remainder of this Section sets out the measures that need to be delivered whilst Appendix 3 provides an overview of what will happen when and by who.

- 5.5 The introduction of a CAZ covering the SAC from 2025 would involve charging people driving certain types of vehicle through the zone based upon the age and type of their vehicle. The aim is to encourage motorists to replace older vehicles with newer vehicles compliant with the latest emissions standards, and in particular Ultra-Low Emission Vehicles or ULEVs, through a graduated charging system (for example, zero charge for ULEV owners, or an increased charge for petrol car owners). It would potentially also encourage those motorists who were able to, to use other routes instead of using roads in close proximity to the Epping Forest SAC. As a precaution no dynamic reassignment has actually been assumed in the traffic modelling used in the development of the evidence base. A series of measures that are intended to encourage the uptake of ULEVs to maximise the likelihood of achieving the conversion of 30% of petrol cars using the modelled roads to ULEVs by 2033 include:
- a) ensuring that the necessary infrastructure for ULEVs is widely and easily available across the District;
 - b) incentivising the replacement of petrol cars with ULEVs, targeted at people who live in areas from which the most frequent trips on roads in close proximity to the Epping Forest SAC arise; and
 - c) Undertaking awareness-raising of both the issue of air pollution and the things that residents and businesses can do to contribute to improving air quality.
- 5.6 The Council recognises that the implementation of a CAZ will not come without some impact on residents and businesses across the District but it also has a legal responsibility to ensure that it can support the delivery of new homes and jobs without having an adverse effect on the integrity of the Epping Forest SAC.
- 5.7 It is vital that the Council ensures that robust monitoring is undertaken so that it can be confident that the implementation of all the measures continues to be 'fit for purpose'. This monitoring will involve the collection of up-to-date traffic and air quality monitoring data from across the Epping Forest SAC. As well as providing up-to-date information on the percentage of ULEVs using roads through the Epping Forest SAC the future monitoring activities will let us know whether the assumed rate of growth in traffic, traffic queuing lengths and time periods when they are greatest are as we thought. It will also enable us to understand whether there are any long-term effects on traffic and travel as a result of the COVID-19 crisis.
- 5.8 The measures set out below have been identified for two reasons. Some can be modelled and therefore provide the greatest level of certainty in terms of their efficacy. Others have been identified because they will help to achieve the delivery of the modelled objective of

securing a switch from petrol to ULEVs, or achieve a reduction in the assumed growth in the number of vehicles using roads in close proximity to the Epping Forest SAC. Some of these measures can be implemented now or within the next one to two years. The CAZ in particular will take longer to bring forward as the scheme needs to be developed in more detail before it can be implemented. A Framework for Delivery is set out in Appendix 3 which sets out the range of measures to be implemented and includes an indicative programme for the delivery of the CAZ.

The required measures:

Provision of Electric Vehicle charging points.

- 5.9 Policy T1 (Sustainable Transport Choices) of the emerging Local Plan requires that any development which proposes vehicle parking spaces must ensure that those spaces have direct access to an electric vehicle charging point. The requirement ensures that there will be greater opportunities for people to be able to access charging points and therefore have greater certainty that the necessary infrastructure will be in place to support ULEVs. This will help to inform future decision-making by residents and businesses when making vehicle purchases or entering into leasing agreements. Automatic Number Plate Recognition (ANPR) data collected has shown that the Vehicle Fleet Mix for vehicles using modelled roads through the Forest is older than the national average and therefore purchase decisions may come forward sooner than might be expected.
- 5.10 As the requirement relates to 'destination' sites as well as 'origin' sites it will give people greater comfort that, if they are purchasing or leasing electric vehicles which have greater range limitations, that charging options will be available. This also supports the wider roll out of measures for the provision of electric vehicle charging points (i.e. autonomous measures) being encouraged and supported by the UK Government.
- 5.11 It is also important to ensure that provision is made in support of Government decisions to introduce the ban of sales of new petrol, diesel and hybrid cars and vans and enable residents and businesses to benefit from financial incentives that have been introduced to support the uptake of electric vehicle purchases and leasing through Road Vehicle Taxation differentiation and company car tax rates.

Can the benefits of the mitigation be modelled?

- 5.12 No account has been taken of the uptake in electric vehicles over and above those included in the air quality modelling undertaken to support the evidence base developed to update the HRA which uses national projections to represent the policy. The modelling does, however, include the proportion of electric and other low-emission vehicles that are currently using roads within close proximity to the Epping Forest SAC based on the data collected through Automatic Number Plate Recognition (ANPR) surveys undertaken in 2019. It is, however, an important measure in support of the achievement of the conversion of petrol cars to ULEVs.

How it will be funded.

- 5.13 This is a requirement for development proposals and will be funded by individual developers.

How it will be delivered.

- 5.14 The measures will be secured through the imposition of planning conditions on individual planning permissions and implemented by site developers.

When it will be delivered.

- 5.15 The Council has already begun to implement this requirement for development schemes that it has been able to approve in accordance with Natural England advice. Its implementation is not dependent on the adoption of the emerging Local Plan.

How its success will be monitored.

- 5.16 Through future ANPR surveys. The take up of electric vehicles will be influenced by a number of factors and not solely on the provision of electric vehicle charging points. However it is an important measure in ensuring that the infrastructure is in place to support the use of ULEVs. Further measures to encourage the purchase of electric vehicles are being investigated as the electrification of the fleet will benefit both human health and the integrity of the Epping Forest SAC. These include the introduction of preferential car parking charging for electric vehicles in Council owned car parks, and working with Essex County Council and the Harlow and Gilston Garden Town to explore the feasibility of ULEVs being able to use bus priority lanes.

Awareness Raising Campaign

- 5.17 The issues of air pollution and the climate crisis are becoming far more widely understood and actions to address them are going higher up the agenda in terms of peoples' and businesses priorities. However, beyond the development world it is thought that little is known by existing residents and businesses within the District of the issues facing the Epping Forest. Beginning an awareness raising campaign about these issues, and helping people to understand that driving a petrol or diesel vehicle on roads within close proximity to the Epping Forest SAC is affecting its long-term health is an important measure in supporting the achievement of a switch from petrol and diesel to electric or other non-polluting vehicles. Of particular importance will be providing information about the range of grants and incentives that exist, together with an understanding of what the longer-term financial savings that could be achieved by switching to electric, or other alternative technologies. This can be an important component of decision making when looking to buy or lease a new vehicle or making decisions as to how people want to travel in the future, as will providing information about the location of charging infrastructure. Such a campaign can begin the

conversation and help to achieve the targets that need to be met in terms of switching from petrol and diesel cars to ULEVs to secure improvements in air quality.

How it will be funded

5.18 By Epping Forest District Council.

How it will be delivered

5.19 By Epping Forest District Council

When it will be delivered

5.20 This will be undertaken initially in 2021 and then at further points over the course of the Plan period.

How its success will be monitored.

5.21 Through air quality monitoring and ANPR surveys which will provide an Epping Forest SAC specific understanding of the uptake in ULEVs and changes in travel behaviour.

Introduction of a Clean Air Zone:

5.22 The air quality modelling that has been undertaken to support the development of this Strategy and to inform the Habitats Regulations Assessment for the emerging Local Plan has demonstrated that, based on current information and assumptions, in order to avoid adverse effects to the integrity of the EFSAC a key mitigation measure will be the need to implement a Clean Air Zone (CAZ) in 2025.

5.23 The approach set out below is in accordance with [Government guidance](#) for the development of a CAZ. A CAZ is a recognised measure for securing improvements in air quality with a particular focus on addressing emissions from vehicles. A CAZ is normally implemented as a mechanism for addressing concerns about high levels of traffic related pollution on human health i.e. NO_x and particulate matter. However, a CAZ could be equally effective in securing improvements in atmospheric pollution which is having an adverse effect on the integrity of the Epping Forest SAC, when targeted appropriately.

5.24 In undertaking the air quality modelling work to support the development of this strategy the Council has collected data on the type and age of vehicles using roads through the EFSAC on a daily basis which means that we have a much better understanding of which vehicles are having the greatest impact on the Epping Forest SAC in terms of emissions of NO_x and ammonia. This has helped us to focus on the type of CAZ that would need to be implemented.

Types of Clean Air Zones

5.25 There are four types, or classes, of conventional CAZ, as follows:

Class Vehicle type

A	Buses, coaches, taxis, private hire vehicles
B	Buses, coaches, taxis, private hire vehicles, heavy goods vehicles
C	Buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, minibuses
D	Buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, minibuses, cars, the local authority has the option to include motorcycles

5.26 The aim of a conventional CAZ is to discourage older vehicles, and in particular diesel vehicles, from using areas which have significant air quality issues such as Air Quality Management Areas (AQMA), as these vehicles make the greatest contribution to emissions of NO_x. Emissions of ammonia, however, are greater from petrol vehicles. As such, a potential fifth CAZ class, or type, may favour electric vehicles or vehicles using other technologies, which have zero on-road emissions of NO_x and ammonia, and would therefore benefit both the integrity of the Epping Forest SAC and the Air Quality Management Area (AQMA), designated within the District in order to protect human health.

5.27 We know from data we have collected that the following vehicle types have the greatest effect on the integrity of the Epping Forest SAC²:

- Vans: Approximately 18% of the daily traffic using roads in close proximity to the Epping Forest SAC is made up of diesel vans but they contributed up to 45% of NO_x emissions in 2017.
- HGVs: Approximately 2% of the daily traffic using roads in close proximity to the Epping Forest SAC is made up of diesel HGVs but they contributed up to 37% of NO_x emissions in 2017.
- Older private cars: Approximately 28% of the daily traffic using roads through the Epping Forest SAC is made up of older diesel cars (pre-Euro 6) which contributed up to 45% of NO_x emissions in 2017.
- Petrol cars: Approximately 40% of the daily traffic using roads through the Epping Forest SAC is made up of petrol cars which contributed up to 88% of ammonia emissions in 2017.

What minimum emission standards are currently being applied to CAZs?

5.28 In terms of NO_x, each vehicle type has a minimum emission standard to avoid charges for entering the CAZ, however there are currently no limitations on emissions of ammonia. A vehicle's emission standard can be found in a vehicle logbook or from the vehicle

² From 2017 ANPR data and air quality modelling.

manufacturer, although there is also a useful vehicle emissions checker on the Transport for London (TfL) website.

- 5.29 To avoid being charged in a traditional CAZ, a vehicle must meet the following minimum standard.

Vehicle type	CAZ minimum standard
Buses, coaches, heavy goods vehicles	Euro VI
Vans, minibuses, taxis, private hire vehicles, cars	Euro 6 (diesel) and Euro 4 (petrol)
Motorcycles	Euro 3

- 5.30 There are some national exemptions from the charge for the following:

- vehicles that are ultra-low emission
- disabled passenger tax class vehicles
- military vehicles
- historic vehicles
- vehicles retrofitted with technology accredited by the [Clean Vehicle Retrofit Accreditation Scheme](#) (CVRAS)³

What type of CAZ might need to be applied for the Epping Forest SAC?

- 5.31 Based on the most up-to-date evidence the type of conventional CAZ that would need to be applied would be a Class D CAZ. This means that the following vehicles would be included:

Buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, minibuses, and cars.

We also have the option to include motorcycles and can bring in some local exemptions. In particular we will need to think about how this might apply to vehicles operated by the emergency services.

Further consideration of the potential implications on emissions of ammonia is currently underway. The feasibility of a potential ‘Class E’ CAZ, which further promotes the use of electric vehicles, should be considered.

³ The key retrofit technologies are:

- Exhaust after treatment systems – these use a diesel particulate filter (DPF) to reduce emissions of particulate matter and a selective catalytic reduction (SCR) system which reduces nitrogen oxide emissions. They are applied to an existing vehicle powertrain.
- Re-power systems – this involves completely stripping out the existing engine and replacing it with a brand-new powertrain which could be a cleaner diesel engine, a petrol engine + LPG system, a 100% electric powertrain or a hybrid electric powertrain.

What does this mean in practice?

5.32 The standards for a conventional Class D CAZ are as follows:

- **Euro 3** for motorcycles, mopeds, motorised tricycles and quadricycles (L category).
- **Euro 4** for petrol cars, vans, minibuses and other specialist vehicles.
- **Euro 6** for diesel cars, vans and minibuses and other specialist vehicles.
- **Euro VI** for lorries, buses and coaches and other specialist heavy vehicles.

This means that vehicles which comply with the appropriate NO_x standard would be able to enter the CAZ without being charged.

5.33 With regard to NO_x, **Euro 3** became mandatory for all new motorcycles in 2007. **Euro 4** became mandatory for all new cars in 2005 and light vans in 2006. **Euro 6** became mandatory for all new heavy-duty engines for goods vehicles and buses from January 2014, from September 2015 for cars and light vans, and from September 2016 for larger vans up to and including 3.5 tonnes gross vehicle weight.

5.34 In developing a CAZ for the Epping Forest SAC careful consideration will need to be given to what categories are included to ensure that we are addressing both NO_x and ammonia. To provide an understanding of the current situation in relation to the vehicles using the Forest we have used the data that we collected in 2017 and 2019. This has enabled us to identify the proportion of vehicles currently using the roads within the Forest which would not comply with the CAZ standards. The 'Epping Forest Special Area of Conservation: Comparing 2017 and 2019 ANPR Vehicle Composition with EFT National Default Fleets Technical Note' 20 February 2020 provides the detailed analysis of the Fleet Composition (*links to be inserted*).

5.35 Vehicles that comply with the CAZ standards set will be able to be driven within the CAZ without having to pay a daily charge. Vehicles which do not comply with the standards can still be driven within the CAZ but would be subject to a daily charge.

5.36 The following are examples of the level of charging, or proposed levels of charging, for other schemes of a similar nature. This helps to understand potential charging levels but it is likely that the charging strategy for the Epping Forest CAZ will differ from a standard CAZ in order to encourage petrol car users to convert to ULEVs or potentially encourage such vehicles to avoid driving through the Epping Forest SAC at all. There is also a potential that some of the monies raised could be used to fund locally based incentives to encourage people to buy ULEVs.

The London Ultra Low Emission Zone (ULEZ):

- £12.50 for most vehicle types, including cars, motorcycles and vans (up to and including 3.5 tonnes).
- £100 for heavier vehicles, including lorries (over 3.5 tonnes) and buses/coaches (over 5 tonnes).

Birmingham CAZ:

- £8 for cars, vans and minibuses
- £50 for HGVs, buses and coaches.

When would a CAZ for the Epping Forest SAC be put in place?

- 5.37 Based on the current evidence a CAZ would need to be put in place in 2025. Prior to that date a significant amount of practical work needs to be undertaken which the Council will need to do in partnership with Essex County Council as the highway authority. Key activities that need to be undertaken in developing the CAZ are set out at Appendix 2. An indicative programme of delivery is provided at Appendix 3 which provides more detail on the indicative dates to support the implementation of the CAZ and its commencement, which is currently anticipated to be in September 2025.
- 5.38 Further monitoring, updating of the evidence base and the Local Plan Habitats Regulations Assessment will form part of the preparatory work to ensure that the CAZ is taken forward based on the most up-to-date evidence available. This is because there are already some initiatives which may influence the take up of less polluting vehicles as set out below.

Changes to London Low Emission Zone

- 5.39 The Mayor of London is introducing higher standards for heavier vehicles entering the London Low Emission Zone (LLEZ) from 1 March 2021. The LLEZ operates to encourage the most polluting heavy diesel vehicles driving in London to become cleaner. The LEZ covers most of Greater London and is in operation 24 hours a day, every day of the year. This includes roads within the London Borough of Waltham Forest such as Woodford Green, which then links in to Epping New Road.

Extension of London Ultra Low Emission Zone

- 5.40 The Mayor of London is introducing changes to the London Ultra Low Emission Zone (LULEZ) in which start on 25 October 2021. The changes involve expanding the current central London LULEZ to create a single, larger zone up to, but not including, the North Circular Road (A406) and South Circular Road (A205). The North Circular Road lies close to the administrative boundary of Epping Forest District and it is likely that some journeys that originate within the District and are made using roads within close proximity to the Epping Forest SAC would have destinations within the extended LULEZ area. Conversely some journeys originating within the ULEZ area may have destinations within the District and beyond which are reached by using roads within close proximity to the Epping Forest SAC. As a result individuals and organisations whose vehicles currently do not comply with the LULEZ standards may already be making decisions about purchasing or leasing less polluting vehicles, and in particular electric or other zero-emission vehicles.

Tax incentives

- 5.41 Government has introduced a number of fiscal incentives and grants for businesses and individuals designed to encourage the take up of electric and low emission vehicles including:
- Reduced car tax
 - Significantly lower tax levels for users of company cars. For company car drivers and fleet operators choosing an electric car from April 2020, there will be zero tax on Benefit in Kind (BIK) during 2020/2021. This zero rate also applies to hybrid vehicles with emissions from 1 - 50g/km and a pure electric range of over 130 miles. There are now 11 new tax bands for vehicles with emissions of 75g/km and below, some of which are linked to the electric mile range that the vehicle offers. The government has also announced the tax rate for the next three years, helping businesses to plan ahead. The electric car tax on benefit in kind rate will increase to 1% in 2021/2022 and 2% in 2022/2023.
 - Cars bought by a business with CO₂ emissions of less than 50g/km are eligible for 100% first year capital allowances. This means with electric cars, the business can deduct the full cost from its pre-tax profits. On a car costing around £40,000 this could amount to a tax relief of £7,600 in the first year.
 - Employers who provide electricity at a place of work can qualify for an exemption to this being taxed as a benefit-in-kind if the electricity is provided via a dedicated charge point, if the charging facilities are provided at or near the workplace and the charging must be available to either all employees or all the employer's employees at a particular location.
 - There are also grants available for businesses and private individuals towards the costs of buying electric charging infrastructure and towards the cost of purchasing a vehicle.

Scrappage schemes

- 5.42 It is understood that the government is potentially exploring introducing a vehicle scrappage scheme which, if introduced, would be incentivising those with the oldest and most polluting vehicles to replace them with an electric vehicle. In addition a number of the larger car manufacturers have initiated their own scrappage schemes. A shift toward electric vehicles would reduce emissions of both ammonia and NO_x and would therefore be of great benefit to the integrity of the Epping Forest SAC. The Council is also exploring options as to whether there is a potential to introduce a locally-based scrappage scheme.

Monitoring and review

- 5.43 The Council fully recognises that the introduction of a CAZ will have a real impact on both individuals and businesses. Therefore, committing to the development and implementation of a CAZ covering roads in close proximity to the Epping Forest SAC has not been taken lightly. However, if we do not take this approach then we would be prevented from bringing forward much needed homes and job opportunities across the District. That is why as part of the detailed work that we will be starting to undertake we need to make sure that the introduction of a CAZ is based on the most up-to-date information so that we can be certain

that we are focusing our efforts in the correct way. We will also be looking at ways in which we may be able to provide financial assistance needed by individuals and businesses in particular and how these could be targeted in the most effective way. It is also important to recognise that although the CAZ would be put in place to protect the Epping Forest SAC, which is an important resource to residents across the District, the more cleaner vehicles there are using roads within the District the better the District's air quality will be for all of our residents.

How it will be funded

- 5.44 The development and implementation of the CAZ, will be funded by securing contributions from relevant development schemes within the District. However, there are currently a number of Government funding initiatives in place to support the development of CAZs. Whilst these are focused on addressing issues of air pollution as they affect human health the Council will be discussing with the Department for the Environment, Farming and Rural Affairs and the Ministry of Housing, Communities and Local Government the potential of securing Government funding recognising the unique challenges that the District is facing. Consequently, the Council will ensure that if alternative funding is secured financial contributions from developments which relate to the implementation of the CAZ will be reimbursed.

Introducing a right-hand turn ban at the junction of the A121 (Honey Lane) into Forest Side

- 5.45 The evidence base has identified that the introduction of a ban for vehicles on the A121 (Honey Lane) turning into Forest Side from the direction of Junction 26 of the M25 motorway towards the Wake Arms Roundabout may be beneficial to parts of the Epping Forest SAC. Introducing this ban may reduce the level of traffic that currently uses Forest Side to access the Robin Hood Roundabout and therefore could reduce the residual nitrogen and ammonia doses past transect N. It would also have a wider benefit in that it would reduce the length of queuing traffic which is currently impeding the safe operation of Junction 26 and the M25 motorway. The Council recognises that the effects of diverting traffic on Epping Forest SAC will need to be adequately assessed and is therefore currently exploring the detailed approach that would be needed to implement this measure.

Site specific initiatives to support species and veteran tree resilience

- 5.46 Local site-based measures will be necessary to increase the resilience of the Drosera plant species within parts of the Epping Forest SAC and align with its conservation objectives. This species is a key attribute of the wet heath SAC qualifying feature and measures are needed to address any possible effects of predicted increases in nitrogen deposition rates. Local site-based measures for a number of veteran oak trees including at Wake Arms Roundabout will also be needed even with the introduction of a ULEZ and the change in the composition of the Vehicle Fleet by 2033.

Initiatives to support walking, cycling and increased public transport use

- 5.47 Policy T1 of the emerging Local Plan seeks to secure reductions in the use of private vehicles for journeys, and in particular, journeys during the peak hours. The spatial strategy for the emerging Local Plan has also been developed in order to maximise the opportunities for reducing vehicle usage. This is a well-established approach to plan-making and decision-making and has multiple benefits. In this instance securing modal shift will have benefits for the Epping Forest SAC and is a positive measure as it will reduce the level of growth in the number of vehicles using roads in close proximity to it. This will support slowing the predicted growth in the number of vehicles contributing to atmospheric pollution and potentially the estimated length of queues, particularly at peak times, which is known to be a contributing factor in respect of atmospheric pollution.

Can the benefits of the mitigation be modelled?

- 5.48 Only a limited amount of modal shift has been modelled as part of the evidence base recognising that what could be achieved is difficult to predict with sufficient certainty. In addition the interventions will also provide opportunities for existing residents of Epping Forest District to change the way that they chose to travel but the limited amount of modal shift assumed does not take account of this wider benefit. Therefore securing a higher level of modal shift has the potential to make an additional contribution to improvements in air quality. For example the Harlow and Gilston Garden Town has set ambitious modal shift targets. Whilst these are challenging there will be significant investment in walking, cycling and public transport infrastructure to support their achievement as part of the development of the allocated Garden Communities. Modal shift is also an important element of the development of the other Masterplan sites within the District, including at Epping and North Weald Bassett.

How it will be delivered

- 5.49 The Council has recently appointed a Sustainable Transport Officer who will be leading on the development of this initiative. This will include taking forward the development of an area wide public transport strategy and working with the Conservators of Epping Forest in the development of an Epping Forest Transport Strategy to support the objective of getting more visitors to come to the Forest by means other than the car.
- 5.50 These strategies will help to then further develop the package of measures to be brought forward. A current package of measures include the provision of public transport, walking and cycling infrastructure and supporting measures as identified in the Infrastructure Delivery Plans developed to support the emerging Local Plan and the Harlow and Gilston Garden Town. The delivery of these measures will be secured primarily in partnership with Essex County Council including through the design of new development, the provision of, or financial contributions toward, sustainable transport initiatives and the adoption of site specific travel plans. Taking forward the implementation of these measures is a key task for the Council's recently appointed Sustainable Transport Officer. The measures and, where appropriate, funding for off-site measures will be secured through the imposition of

planning conditions or securing Section 106 planning obligations on individual planning permissions and implemented by site developers or Essex County Council. For larger sites the provision of infrastructure to support public transport, walking and cycling related infrastructure will be provided on, or in close proximity to the relevant site and the design and layout of schemes will be required, primarily through Policies SP2 (Place Shaping) SP3 (Development and Delivery of Garden Communities in the Harlow and Gilston Garden Town) T1 (Sustainable Transport Choices), DM9 (High Quality Design), D1 (Delivery of Infrastructure) and the site specific requirements set out in Chapter 5 and Part Two of the emerging Local Plan.

How it will be funded

- 5.51 Through a number of funding schemes including through the securing of financial contributions from planning applications, Essex County Council Local Transport Funding, Department for Transport funding and where appropriate available funding bids such as the Housing Infrastructure Fund.

When will it happen

- 5.52 In accordance with the timescales for delivery as set out in the relevant Infrastructure Delivery Plans and through the phasing plans developed to support the Masterplanning of the strategic sites proposed for allocation in the emerging Local Plan. In addition larger development schemes are already required to be supported by Travel Plans.

How its success will be monitored

- 5.53 Through the monitoring of site specific travel plans, the delivery of infrastructure through investment programmes including those identified in the emerging Local Plan and Harlow and Gilston Infrastructure Delivery Plans, and through future traffic monitoring. Ultimately the success of these elements together with the other proposed measures will collectively be understood through the future on-site air quality and traffic monitoring to be undertaken on roads through the Epping Forest SAC.

HGV Route Management Strategies

- 5.54 Route Management Strategies will be required for relevant developments which will generate HGV movements, including in relation to construction traffic. This is a well-established planning mechanism and will enable HGV restrictions to be placed on, primarily, employment development within the District to prevent an increase in HGVs on roads in close proximity to the Epping Forest SAC. HGVs contribute to atmospheric pollution in two ways. Firstly, they are primarily diesel fuelled. Secondly, they contribute to queuing traffic both in terms of their size (an HGV is on average equivalent to 2.3 passenger car units) but also because they are slower moving vehicles when they move through junctions they take a greater amount of time and therefore contribute to queuing at those junctions. The use of Route Management Strategies will help to reduce the number of new HGVs that will use

roads within close proximity to the Epping Forest SAC from the larger employment allocations proposed in the emerging Local Plan.

How it will be funded

- 5.55 This will be a requirement of any planning application in relation to principally new employment development sites or extensions to existing sites. Therefore, there is no specific financial cost associated with this measure.

How it will be delivered

- 5.56 The measures will be secured through the imposition of planning conditions or Section 106 planning obligations on individual planning permissions and implemented by site developers.

When it will be delivered

- 5.57 The requirement for certain types of development to provide Route Management Strategies is already in place and is therefore already being implemented.

How its success will be monitored

- 5.58 Through future traffic monitoring and ANPR surveys.

Provision of Digital Communications Infrastructure

- 5.59 The promotion and enhancement of communications infrastructure supports the objective of reducing car usage, and will support reductions in work based travel. This will therefore support a slowing down of the predicted growth in traffic on roads in close proximity to the Epping Forest SAC.

Can the benefits of the mitigation be modelled?

- 5.60 Not specifically. However it is considered to be a required measure as it will have a beneficial effect on the Epping Forest SAC as a result of reductions in traffic growth.

How it will be delivered

- 5.61 Through the application of Policy D5 of the emerging Local Plan. The Policy requires all major development proposals to demonstrate how high speed broadband infrastructure will be accommodated. In addition other initiatives that are in place which are not linked to development, such as the Superfast Essex programme, will result in improved communications infrastructure for existing residents and businesses which will support home-working for existing residents.

How it will be funded

- 5.62 This is a requirement for new development sites and will be funded by individual developers.

When will it be delivered

- 5.63 The requirement for certain types of development to provide Digital Communications Infrastructure is already in place and is therefore already being implemented.

How its success will be monitored

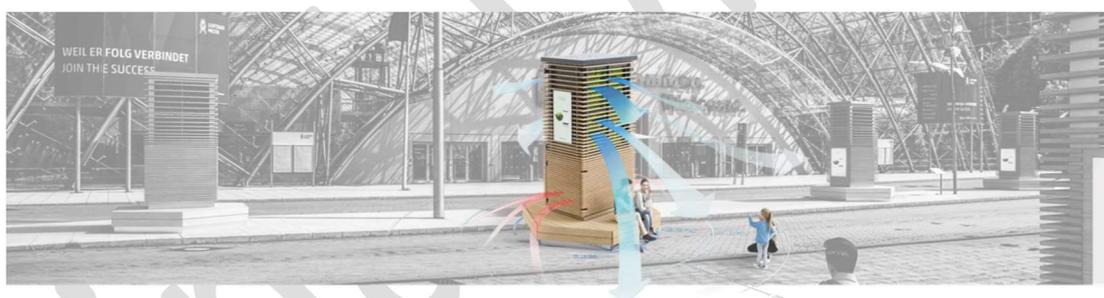
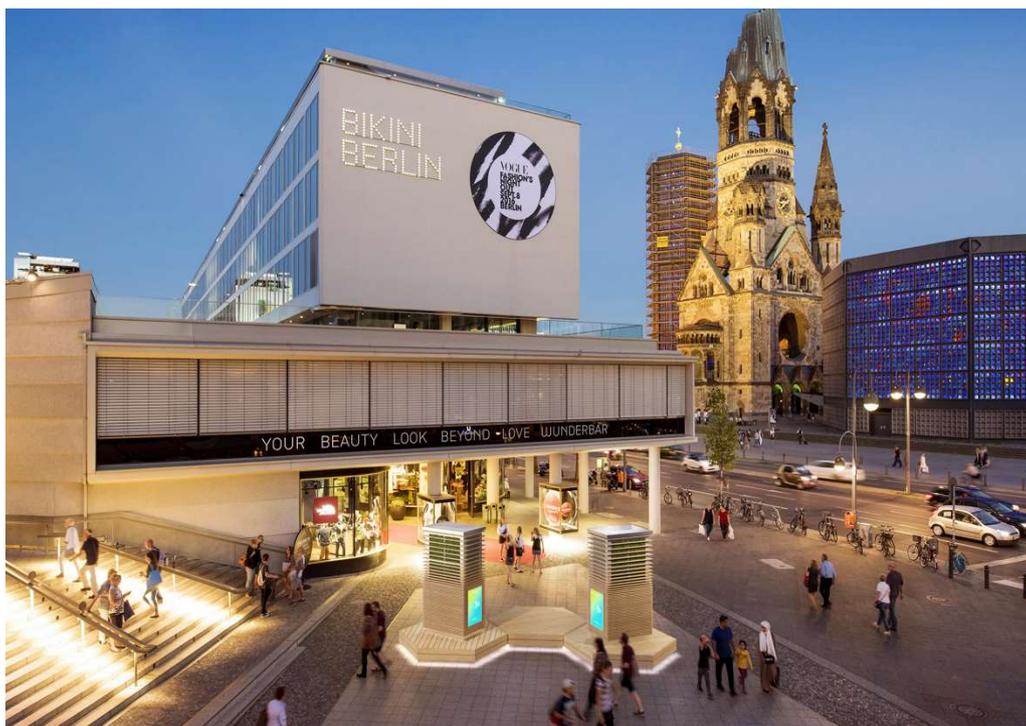
- 5.64 Through traffic monitoring which will tell us whether the growth in traffic is as predicted.

Trialling new technologies

- 5.65 Recognising the challenges that many places are experiencing in relation to the effects of air quality on both human and ecological health there are a number of new technologies that the Council considers could be trialled in the Epping Forest SAC to support the measures identified above. It is important that we consider trying some of these technologies, which in some cases, may actually involve using the Epping Forest SAC as a real world opportunity to test their effectiveness. There are two measures in particular that we are investigating implementing.

City Trees

- 5.66 The ability of certain moss cultures to filter pollutants such as particulate matter and nitrogen oxides from the air makes them ideal natural air purifiers. But in cities, where air purification is a great challenge, mosses are barely able to survive due to their need for water and shade. This problem can be solved by connecting different mosses with fully automated water and nutrient provision based on unique Internet of Things technology. Air filtering performance is quantitatively proven and the plants' requirements are measured in real time. The City Tree came into being in order to address these issues by providing the world's first bio-tech filter to quantifiably improve air quality.
- 5.67 City Trees have been installed by the London Borough of Waltham Forest at Leytonstone Station and The Thatched House (at the junction of two heavily trafficked roads – Leytonstone High Road / Leytonstone Road and Cann Hall Road / Crownfield Road). Whilst these have been developed in order to respond to the effects of air pollution on human health they target one of the key pollutants that we are trying to address. They are self-sustaining structures that contain a water tank, with automatic irrigation and plant sensors all powered by on board solar panels and batteries. Consequently, they could be suitable for locating at Wake Arms Roundabout and Robin Hood Roundabout in particular. More information can be viewed [here](#). This initiative is currently being explored with the potential to implement within the next twelve months.



A road based pollution extraction system

- 5.68 This is a new patented technology which captures pollution at the source of production - in the roadway, next to vehicle exhausts. A series of partially submerged pods are installed in the centre of the roadway at "hotspot areas" of high pollution, slow moving and or stationary traffic. These pods are connected under the surface to pipework which extracts the polluted air into a roadside cleaning unit. The air that leaves the roadside unit is cleaned to a rate of 99%, removing particulate matter (PM1 - PM10) along with a range of harmful gases including Nitrogen Oxide (NO_x), Carbon Monoxide (CO), Hydrocarbons (HC) and Ozone (O₃). The road based pods can also be used for "lane delineation" also known as "white lines". The maintenance required by the roadside air cleaning unit varies depending on the density of pollution and volume of traffic but timescales vary between 3 and 12 month intervals. This is currently being explored with the developers of the initiative and once further details of its implementation are known the Council will seek Essex County Council's

support for its implementation. There is potential that this could be trialled within the next 12-24 months.

Other initiatives

- 5.69 This Strategy identifies the package of measures that the Council has identified as being the most effective in managing the effects of development on the Epping Forest SAC. However, the Council recognises that there may be other measures that developers may wish to propose or which may emerge in due course arising from national and international research and development activity. The Council will consider such measures and support site specific initiatives not referred to in this Strategy if it can be clearly demonstrated that such approaches will be effective in addressing the effects of atmospheric pollution on the integrity of the Epping Forest SAC.

6 Monitoring and Review

- 6.1 The Council, as local planning authority, is legally required to undertake a review of its Local Plan every five years. The first review needs to be completed within five years of the adoption of the emerging Local Plan. Whilst this does not automatically mean that the Local Plan itself will be updated the review should be informed by the monitoring of data to understand if key indicators in the Local Plan are being achieved, and if they are not, then this can act as a 'trigger' which requires the Council to undertake an update to its Local Plan in order to rectify/remedy any issues identified through the review.
- 6.2 In this regard, undertaking a planned approach to air quality monitoring to assess progress on improvements to air quality across the Epping Forest SAC is a necessary and key component of this Strategy as ultimately the success of all the mitigation measures collectively will be better understood through monitoring in order to assess the progress being made towards improving air quality. This will involve a number of elements as follows:
- Provision of a continuous air quality monitoring unit. The pollutants to be monitored and the most effective location for doing so will be discussed and agreed with Natural England and the Conservators of Epping Forest. The permanent facility will provide an important source of information based on continuous monitoring which takes account of different seasons and changes in traffic levels across the year and enable verification of the data collected from the periodic on-site monitoring data (see below).
 - Undertaking on-site passive monitoring of Ammonia and NO₂ (primarily through the use of diffusion tubes but also using Alpha Samplers on transects which the evidence has indicated are the subject of the greatest impacts from ammonia concentrations within the Epping Forest SAC. The same sites and methodology as that undertaken for the air quality monitoring undertaken over the period May 2018 – February 2019 will be used to ensure consistency in the data used and its analysis for comparative purposes. The next period of on-site monitoring will be undertaken for a period of 9 months and will commence in May 2024. This date has been proposed as it will provide more up-to-date

information to inform the final scheme design of the CAZ and give an early indication of the progress toward achieving the Strategy's objectives. This approach is in accordance with Policy D8 of the emerging Local Plan. There is also a need to provide sufficient time for some development to come forward recognising that very little development has been consented across the District since 2018. The nine month period will allow for an analysis of conditions with and without leaf cover and provides significant periods where traffic levels are not reduced as a result of school and public holidays. This monitoring will build on the outputs from the continuous air quality monitoring station.

- The results of the on-site monitoring will be used to assess progress towards the 'predicted' air quality conditions as set out in the current evidence base.
- Undertaking traffic monitoring using Automatic Traffic Counts and Automatic Number Plate Recognition will enable comparisons to be made at key parts of the road network in close proximity to the Epping Forest SAC which aligns with the air quality monitoring. This will provide a comparable basis for undertaking a review of progress and indicate whether there is a need to update the Local Plan in order to be able to continue to demonstrate that it will not have an adverse effect on the integrity of the Epping Forest SAC.

6.3 This monitoring information will be assessed by undertaking further air quality modelling work, using the same methodology and using the most up-to-date projections from the Department for Environment, Food and Rural Affairs. On the basis of the most up-to-date modelling outputs the Council will undertake an assessment as to whether the Local Plan should be updated in relation to the level and location of development across the District in consultation with Natural England as the statutory body responsible for the oversight of internationally designated sites. This will include consideration as to whether any issues regarding expected improvements are locally derived or are related to regional or national effects, and to which pollutants these issues relate to. It will also help to identify whether any changes to the CAZ scheme are required.

6.4 Natural England have also advised that the extent and abundance of the cushion moss *Leucobryum* should be surveyed and monitored in areas which are vulnerable as part of the monitoring programme to inform the Local Plan interim reviews.

7. Implementing the Strategy

7.1 The approach to implementing the Strategy is summarised at Appendix 3 and costing information is summarised at Appendix 4. The Strategy requires the implementation of some measures which are strategic in nature rather than site specific. In addition there is a cost associated with undertaking the monitoring and comparative assessments. These elements will be delivered by the Council and its partners and will be funded through the payment of financial contributions from all relevant development proposals which are proposed to be approved under the Town and Country Planning Acts. The approach has been developed in accordance with Regulation 122 of the Community Infrastructure Regulations based on the relative contribution made by development proposed in the Council's emerging local plan (derived from the Council's evidence base to support the

development of this Strategy) and viability considerations. The financial contributions to be secured are as follows:

Residential Development:

The Garden Communities (GCs): £232 per dwelling.

North Weald Bassett Masterplan Area and South of Epping Masterplan Area: £641 per dwelling.

Smaller sites (including windfall sites) and the Waltham Abbey Masterplan Area: £335 per dwelling.

Non-residential development

The Council has given consideration to viability issues in relation to employment related developments within the District including as a result of the impact of the COVID 19 crisis. It therefore will only be seeking financial contributions from development proposals on the proposed employment allocations at North Weald Airfield (NWB.E4) and Land north of A121 (WAL.E8) as follows:

NW Airfield: £206,017

WAL.E8: £206,017

Other trip generating development proposals will be considered on a case by case basis.

Appendix 1: Non-planning related activities

Wider activities being undertaken or proposed to be undertaken by the Council

1.1 As well as its function as a local planning authority the Council has duties under the Environment Act 1995 with respect to Local Air Quality Management (LAQM). Whilst the Council's LAQM role is focused on the effects of air quality on human health some of these activities will also have a benefit with respect to supporting improvements in air quality which will be beneficial to ecological health. The Council has decided to incorporate all activities that support air quality improvements for both human and ecological health to ensure that a complete and comprehensive approach is provided in one place. Some of the activities that the Council is undertaking or exploring are as follows:

- Clean Air Day – undertake additional promotional work outside schools, focussing on known problem areas, speaking to parents in vehicles and also raising awareness with the children.
- Idling vehicles promotion campaign – Raise awareness of the impacts of idling vehicles and that idling is an offence that may lead to the issuing of an FPN. Enforcement of Idling Vehicles by EFDC – officers have been given the necessary authority to serve Fixed Penalty Notices (May 2018). It is intended for this power to be targeted where complaints are received and it will follow a promotional campaign to highlight this power to residents. There are opportunities to consider whether there are opportunities to include the use of FPNs at sensitive parts of the Forest.
- Effective regulation of Part B and Part A2 regulated activities including solvent emission activities.
- Investigation of complaints regarding, and regular reviews to search for unpermitted industrial activities.
- Investigation of complaints and effective regulation in respect of industrial and domestic bonfires.
- Investigation of complaints, provision of information and effective regulation of smoke control areas (Loughton and Waltham Abbey).
- Participation in 'Clean Air Day' anti-idling promotion initiatives with a focus outside schools.

Working with Partners and Landowners

1.2 There are a number of areas where the Council will use its influence with Partners and Landowners, including through the Green Arc Partnership, in respect of the following:

- Encouraging the change to cleaner buses

- Working with the Conservators of Epping Forest, as a landowner, with regard to management of its agricultural landholdings and use of buffer lands for grazing
- Working with the Conservators of Epping Forest and Essex County Council to encourage the development of an up-to-date Transport and Access Management Strategy for the Forest, including an appropriate approach to encouraging visits to the Forest by means other than the Car such as charging for car parking.
- Working with landowners to encourage changes to land management and agricultural practices by promoting, for example, the government's national Code of Good Agricultural Practice.

Activities outside of the Council's sphere of influence

1.3 The government's Clean Air Strategy 2019 has identified a number of actions that it will undertake which will support reductions in the effects on habitats from ammonia, which primarily arises from agricultural practices. It should be noted that these measures have not been taken into account in modelling the 'Mitigated' scenarios in relation to understanding the effects of development on air quality on the Forest. These actions are as follows:

- Government has provided a national code of good agricultural practice (COGAP) to reduce ammonia emissions.
- Government will require and support farmers to make investments in the farm infrastructure and equipment that will reduce emissions.
- A future environmental land management system will fund targeted action to protect habitats impacted by ammonia.
- Government will continue to work with the agriculture sector to ensure the ammonia inventory reflects existing farming practice and the latest evidence on emissions.
- Government will regulate to reduce ammonia emissions from farming by requiring adoption of low emissions farming techniques.
- Government will extend environmental permitting to the dairy and intensive beef sectors.
- Government will regulate to minimise pollution from fertiliser use, seeking advice from an expert group on the optimal policy approach.
- A future environmental land management system will fund targeted action to protect habitats impacted by poor air quality. Achievement of our 2030 air quality targets will reduce the pressure of emissions on semi-natural habitats. However, despite projected improvements, some vulnerable habitats will still be exposed to nitrogen deposition and atmospheric levels of ammonia that are greater than they can tolerate. Natural England is currently examining options to improve the effectiveness of incentive schemes for mitigating ammonia emissions to air and protecting natural ecosystems. In addition, we have commissioned further work to investigate how these habitats might be protected most effectively through new environmental land management schemes.

1.4 Government proposes to introduce rules on specific emissions reducing practices including:

- a requirement to take action to reduce emissions from urea-based fertilisers. Government proposes to consult on this policy in 2019 with a view to introducing legislation in the shortest possible timeframe;
- a requirement for all solid manure and solid digestate spread to bare land (other than that managed in a no-till system) to be incorporated rapidly (within 12 hours) with legislation to be introduced in the shortest possible timeframe;
- a requirement to spread slurries and digestate using low-emission spreading equipment (trailing shoe or trailing hose or injection) by 2025. Government will also consider options for phasing in this requirement so that those spreading digestate or large volumes of slurry may be required to adopt the practice at an earlier date;
- a requirement for slurry and digestate stores to be covered by 2027. Government will consider options for phasing in this requirement so that those producing or storing digestate or large volumes of slurry may be required to adopt the practice at an earlier date.
- mandatory design standards for new intensive poultry, pig and beef livestock housing and for dairy housing. The standards will be designed in collaboration with industry experts and will include design features to improve animal health and welfare and minimise environmental pollution to air (including greenhouse gas emissions), water and land as far as practicable
- Emissions of ammonia fell by 13% between 1980 and 2015. However, since then there has been an increase in emissions, largely as a result of fertiliser use. Government's aim is to reduce emissions of ammonia against the 2005 baseline by 8% by 2020 and 16% by 2030.

Appendix 2

Process for the implementation of a Clear Air Zone for the Epping Forest SAC

Developing the Clean Air Zone (CAZ) will be undertaken in line with the latest Government guidance which is currently [‘Clean Air Zone Framework: Principles for setting up Clean Air Zones in England.’ February 2020](#)

A number of actions and activities that will need to be undertaken in the development of the CAZ and its current anticipated date of delivery of 1 September 2025 subject to the outcomes of the monitoring scheduled to be undertaken in 2024/25.

A summary of a number of key actions are set out below.

Establishment of a Stakeholder Working Group to take forward the development of the CAZ.

The Stakeholder Working Group would be jointly led by:

Epping Forest District Council (in its role as competent authority and potential funding authority)
Essex County Council (in its role as local traffic and charging authority)

Core membership:

Highways England
Transport for London
London Borough of Waltham Forest
London Borough of Redbridge
Natural England
Conservators of Epping Forest

Engagement with wider group of stakeholders including:

Local business representatives
Bus operators
Transport user groups
Local community representatives
Emergency services
Taxi companies

Development of traffic model to allow analysis of traffic growth, distribution and the potential for trip assignment with the implementation of a Clean Air Zone.

This is a necessary tool to be able to understand the effects of the introduction of a CAZ across the Epping Forest Special Area of Conservation on the wider road network. This will aid the work of the Stakeholder Working Group in understanding and identifying any interventions needed within the wider road network to mitigate any reassigned traffic. The stakeholder working group will be used to agree the nature of the model to be used and the assumptions to be incorporated. However, this should be based on the data incorporated into the traffic modelling used to inform the HRA 2020 and should use data collected in 2017 to ensure consistency with future forecasting of vehicle trips.

Roads to be incorporated in the CAZ to be confirmed by the stakeholder working group but are likely to include all roads which provide access into the Epping Forest SAC and align with those roads which were used for the collection of ANPR data in 2019.

Awareness raising:

The Council has committed to undertaking an initial awareness raising campaign in 2021 with the intention of this being a longer-term initiative. Raising awareness of the issue is an important step in the journey of moving toward the implementation of a CAZ.

Development of the business case:

The stakeholder working group to develop the full business case for, and detailed implementation of, the scheme including the most appropriate approach to enforcement being either:

- an access restricted zone based on vehicle standards using a traffic regulation order (TRO); or
- an environmental charging scheme using road user charging powers.

In addition the stakeholder working group should establish the level of charges.

Consultation and engagement:

Consultation and engagement with communities and stakeholders will be undertaken at key stages of developing the CAZ proposals to provide opportunity to shape the final scheme.

Democratic Oversight

It will be important that elected members of both Epping Forest District Council and Essex County Council are fully engaged in the process. This will include regular briefings and more formal agreement at key stages in the process. This will include securing democratic sign-off of the scheme for implementation. The decision in relation to the final scheme design will be informed by the analysis of the latest evidence base and any further HRA considerations in consultation with Natural England.

Monitoring and Review

The stakeholder working group would be responsible for the oversight of the traffic and air quality monitoring to be undertaken in accordance with the approach to monitoring and review set out in the Monitoring and Review section of this Strategy.

Implementation

This will include the necessary statutory processes needed to implement the CAZ, as well as putting in place the necessary physical infrastructure (including complementary highway schemes and/or measures) including signage and monitoring equipment, publicity and guidance in relation to the operation of the scheme.

Appendix 3: Mitigation Measures Framework for Delivery

Measure	When	How	Whom
Electric Vehicle Charging Points	Now and on-going	Planning condition	Planning applicants
Electric Vehicle charging points in EFDC car parks	2021 onwards	Financial investment by the Council	EFDC
Awareness Raising campaign	2021	Development and implementation of publicity and information sharing	EFDC
Introduction of Clean Air Zone	September 2025 (see detailed indicative timeline below).	Securing financial contributions from relevant planning applications.	EFDC/ECC
Implementation of right-turn ban from A121 to Forest Side.	Prior to the first operation of any development permitted on Land north of the A121 (Wal.E8).	Legal agreement in relation to any development permitted on Land north of the A121 (WAL.E8).	ECC/EFDC
Veteran Tree Management Plan	2021 and then on-going implementation	Securing financial contributions from relevant planning applications.	EFDC/Conservators of Epping Forest
Initiatives to support walking, cycling and increased public transport use.	Now and on-going	Through the implementation of the Harlow and Gilston Garden Communities, Masterplan sites, and/or securing financial contributions from relevant planning applications in accordance with the emerging Local Plan and Harlow and Gilston Garden Town Infrastructure Delivery Plans.	ECC/EFDC/Planning applicants.
Route Management Strategies	Now and on-going	Planning condition and/or Section 106 planning obligation.	ECC/EFDC/planning applicants.
Supporting home working	Now and on-going	Planning condition and/or Section 106 planning obligation to secure broadband/digital infrastructure.	Planning applicants
Trialling City Trees	Indicative timescale: 2021	Securing financial contributions from relevant planning applications.	EFDC/landowners
Road based pollution extraction system	Indicative timescale: 2021	Securing financial contributions from relevant planning applications or on a trial basis.	ECC/EFDC

Indicative timetable and actions for implementation of Clean Air Zone in 2025

Activity	When
Establishment of core working group	January 2021
Development of traffic and air quality model specifications	March – June 2021
Initial awareness raising (local communities/businesses/wider stakeholder groups).	Spring/Summer 2021
Development of traffic and air quality models (including data collection if necessary)	June 2021- June 2022
Preparation of full business case including feasibility and options testing.	July 2022-December 2022
Further awareness raising and stakeholder engagement activity	January 2023 – March 2023.
Detailed scheme design	April 2023-September 2023
Democratic processes	October 2023- December 2023
Consultation on final scheme	January 2024-March 2024
Finalisation of scheme and legal processes.	April 2024-October 2024
Analysis of the latest evidence base and any further HRA considerations in consultation with Natural England.	March 2025-May 2025
Further awareness raising of scheme implementation	May 2025 – June 2025
Provision of scheme infrastructure (e.g. cameras/signage)	May 2025 – August 2025
Commencement of CAZ	September 2025
Review of CAZ following further on-site traffic and air quality monitoring	2030

Appendix 4: Indicative costs of implementing the Strategy

Activity	Components	Costs
Development and Implementation of Clean Air Zone	Feasibility and scheme development comprising (includes ECC staff costs): <ul style="list-style-type: none"> • Development of traffic model including data collection • Updating air quality model • Development of scheme including business case • Consultation and engagement 	£1,310,000
	Implementation comprising: <ul style="list-style-type: none"> • Purchase and placement of scheme infrastructure • Publicity • Statutory processes • Charging IT systems 	£1,151,110
	Scheme monitoring and review.	Costs included in Monitoring and Review section below
Air quality monitoring and review	Monitoring comprising: <ul style="list-style-type: none"> • Permanent air quality monitoring station and on-going analysis of data. • On-site monitoring of pollutants for a nine month period in 2024/25 and 2029/30 and analysis of data for progress and model verification purposes. • Traffic monitoring (including Automatic Number Plate Recognition). • Survey and monitoring of extent and abundance of cushion moss <i>Leucobryum</i> • Update of HRA traffic and air quality modelling and verification. • Update of HRA to establish progress and ability to continue to conclude 'no adverse effects'. 	£472,500
Veteran Tree Management and Drosera plant species	Development of Strategy and implementation over Plan period (12 years)	£40,000
City Trees	Purchase and placement – 2 x City Trees	£60,000
EFDC Staff costs	Implementation of Strategy (2021 – 2033)	£400,000

Total costs		£3,433,610
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