



GUILDFORD  
BOROUGH

## Guildford Borough Council Shalford Air Quality Action Plan

In fulfilment of Part IV of the  
Environment Act 1995  
Local Air Quality Management

September 2019

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## Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Shalford between 2020 and 2025.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas<sup>1,2,3</sup>.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion<sup>4</sup>. Guildford Borough Council (GBC) is committed to reducing the exposure of people in Shalford to poor air quality in order to improve health.

We have developed actions that can be considered under eight broad topics:

- Alternatives to private vehicle use
- Policy guidance and development control
- Promoting low emission transport
- Promoting travel alternatives
- Public information
- Transport planning and infrastructure
- Traffic management
- Vehicle fleet efficiency

Our priorities are to reduce vehicle use where possible, reduce congestion in Shalford and improve the vehicle fleet in relation to emissions. In terms of measures within this plan, the following points have been taken into consideration:

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010; available at <https://jech.bmj.com/content/59/11/948.altmetrics>

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006; available at [https://uk-air.defra.gov.uk/library/reports?report\\_id=424](https://uk-air.defra.gov.uk/library/reports?report_id=424)

<sup>3</sup> Barnes, J., Chatterton, T., & Longhurst, J. (2019). Emissions vs exposure: Increasing injustice from road traffic-related air pollution in the United Kingdom. *Transportation Research Part D: Transport and Environment*, 73, 56-66. <https://doi.org/10.1016/j.trd.2019.05.012>. Available from <https://uwe-repository.worktribe.com/output/1491851>

<sup>4</sup> Defra. Abatement cost guidance for valuing changes in air quality, May 2013

- The majority of emissions arise from cars, with some contribution from Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs);
- There is no decipherable contribution from point sources or industry;
- There is not a large contribution from buses;
- Origin Destination surveys suggest that a relatively small proportion of car trips (15%) have the potential for modal shift;
- Origin Destination surveys suggest that the majority of trips in the morning and afternoon peak are work related. Journey purpose was more variable in the interpeak and included activities such as shopping, visiting friends and leisure activities; and
- Any measures which will take longer than 2023 to implement and have effect, are unlikely to bring forward compliance with the air quality objectives.

Because of the above points, it is going to be very difficult to implement a measure which will have a large enough impact to improve the situation in a short timescale. In this AQAP we outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe), but for which we may have useful evidence, and so we will continue to work with regional and central government on policies and issues beyond GBC's direct influence.

## **Responsibilities and Commitment**

This AQAP was prepared by Regulatory Services of Guildford Borough Council with the support and agreement, in particular of William Bryans of the Strategic Transport Team, Surrey County Council, as well as a wider steering group made up of Guildford Borough Council local authority officers and also from Waverley Borough Council.

This AQAP has been approved by:

Councillor Caroline Reeves, Leader of the Council, Guildford Borough Council;

Guildford Borough Council Corporate Management Team;

Surrey County Council Highways;

This AQAP will be subject to an annual review, appraisal of progress and reporting to the Guildford Joint Committee (Surrey County Council and GBC). Progress each

## **Guildford Borough Council**

year will be reported in the Annual Status Reports (ASRs) produced by Guildford Borough Council, as part of our statutory Local Air Quality Management duties.

If you have any comments on this AQAP please send them to:

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# **1 Introduction**

This report outlines the actions that GBC will deliver between 2020 and 2025 in order to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to the Shalford area.

It has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This Plan will be reviewed every five years at the latest and progress on measures set out within this Plan will be reported on annually within Guildford Borough Council's air quality Annual Status Report (ASR).

Guildford Borough Council faces a number of challenges in order to improve air quality. Surrey is a densely populated county and traffic flows on A roads are almost double the national average. In Shalford, a combination of volume of vehicles, stop start traffic caused by congestion, and properties situated close to the carriageway (meaning that high concentrations don't disperse as quickly as they would elsewhere) has led to increased concentrations in a localised area. Traffic volumes include a high number of work and leisure trips, the distance of these trips meaning that there is a relatively low potential for modal shift. A number of options are included in this report, which have been evaluated by the AQAP steering group.



## 3 Guildford Borough Council's Air Quality Priorities

### 3.1 Public Health Context

Air pollution is a major public health risk ranking alongside cancer, heart disease and obesity. A review by the World Health Organization concluded that long-term exposure to air pollution reduces life expectancy by increasing the incidence of lung, heart and circulatory conditions. The Department of Health and Social Care's advisory Committee on the Medical Effects of Air Pollutants (COMEAP) have estimated that long-term exposure to man-made air pollution in the UK has an annual impact on shortening lifespans, equivalent to 28,000 to 36,000 deaths<sup>5</sup> (COMEAP, 2018). Poor air quality can affect health at all stages of life. Those most affected are the young and old. In the womb, maternal exposure to air pollution can result in low birth weight, premature birth, stillbirth or organ damage. In children there is evidence of reduced lung capacity, while impacts in adulthood can include diabetes, heart disease and stroke. In old age, a life-time of exposure to air pollution can result in reduced life-expectancy and reduced wellbeing at end of life. There is also emerging evidence for a link between air pollution and an acceleration of the decline in cognitive function<sup>6</sup>.

The Public Health function aims not only to improve health, but also reduce health inequalities by using an evidence based approach to make recommendations on the delivery of health and well-being services. The Guildford Health and Wellbeing Strategy<sup>7</sup> recognises that *"Air Pollution is a significant public health issue. In Guildford, the key pollutants are specifically nitrogen dioxide (NO<sub>2</sub>) and fine particulates, these are principally from traffic emissions. Public Health England estimate that 5.7% of deaths in those over 25 years old are from long term exposure to anthropogenic particulate pollution."* Desired outcomes of the Strategy include identification of areas with high levels of pollution and introduce measures to improve air quality and encouraging the use of lower polluting transport options. As such, this action plan supports work underway within the public health arena.

<sup>5</sup> COMEAP 2018, Associations of long-term average concentrations of nitrogen dioxide with mortality. Available at <https://www.gov.uk/government/publications/nitrogen-dioxide-effects-on-mortality>

<sup>6</sup> Defra 2019. Clean Air Strategy. Available at <https://www.gov.uk/government/publications/clean-air-strategy-2019>

<sup>7</sup> <https://www.guildford.gov.uk/healthandwellbeing>

## 3.2 Local Planning and Policy Context

### 3.2.1 Local Plan

The Guildford Borough Council Local Plan which will be in place until 2034, was adopted on 25 April 2019. Air Quality is referred to in paragraph 4.6.31 of the Local Plan<sup>8</sup>, which states:

*“Well designed developments may actively help to enhance air quality and reduce overall emissions, therefore reducing possible health impacts. “*

In relation to mitigation, air pollution is referred to under Policy ID3 (Sustainable transport for new developments):

*This mitigation: .... (b) will address otherwise adverse material impacts on communities and the environment including impacts on amenity and health, noise pollution and air pollution.*

Within the evidence base for the new Local Plan, an investigation of the impacts of development plans on air quality has been undertaken. The air quality assessment considered the potential effect of the proposed plan at key receptor locations within GBC area. In summary, the findings of the assessment suggest that the effect of the Local Plan on annual mean NO<sub>2</sub> concentrations will be negligible and not a key constraint on development in the majority of the GBC area. The report advised that further detailed modelling would be advisable around roads where notable changes in traffic flows are predicted, including the A3/ A31 junction particularly Guildford and Godalming bypass and Farnham Road.

### 3.2.2 Guildford Town Regeneration Strategy

The Guildford Town Centre Regeneration Strategy<sup>9</sup> seeks to deliver a thriving and vibrant forward-looking town centre that embraces innovation to take best advantage of new and emerging technologies whilst respecting the town’s history and heritage and preserving what makes Guildford special. The strategy sets out a number of strategic priorities including aspirations to improve sustainable transport, improvements to the A3 and borough wide road network, high quality cycling and walking network, a reduction in air pollution and improving public health and wellbeing. The strategy builds on the town centre masterplan which aims to implement a number of place-making concepts including reducing the dominance of

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<sup>8</sup> Available at <https://www.guildford.gov.uk/newlocalplan/16116>

<sup>9</sup> Available at <https://www.guildford.gov.uk/article/20314/Town-Centre-Regeneration-Strategy>

traffic, a healthy approach to movement which encourages a modal shift from the car to the other more sustainable forms of transport and a new riverside park.

### **3.2.3 Local Transport Plan**

The Surrey Transport Plan<sup>10</sup> is the third Local Transport Plan (LTP) for the county. It is a statutory plan (required by the Local Transport Act 2008 and Transport Act 2000), which replaced the second LTP on 1 April 2011. Like the previous Plans, the Surrey Transport Plan is partly an aspirational document. The strategies look forward to 2026 and are reviewed as necessary. The Local Transport Strategies and Forward Programmes cover a three-year cycle and are updated and rolled forward regularly.

The vision of the LTP is:

*To help people to meet their transport and travel needs effectively, reliably, safely and sustainably within Surrey; in order to promote economic vibrancy, protect and enhance the environment and improve the quality of life.*

Based on this, one of the four objectives is to provide an integrated transport system that protects the environment, keeps people healthy and provides for lower carbon choices. As one of the most densely populated counties in the UK with traffic flows on A roads almost double the national average, transport related problems are a major concern for people living and working in Surrey. There are a number of strategies which form part of the Surrey Transport Plan including an Air Quality Strategy which uses a twin track approach, both focussing on AQMAs in the County and delivering Countywide improvements delivered through synergies with other Surrey Local Plan strategies, and other county council strategies to restrain traffic growth, reduce vehicle delay, reduce vehicle emissions and improve the provisions of travel information to people on the air quality impacts of their travel choices.

The Air Quality Strategy provides a toolkit of measures, based around infrastructure measures, management of infrastructure, promotional and behavioural measures, information provision and other measures including planning and taxi licensing etc.

The Strategy acknowledges that:

*In future, infrastructure to support use of hybrid/electric vehicles could become a key measure for reducing air pollution in Surrey and the designated AQMAs, through a reduction in tailpipe emissions of such vehicles. The Climate Change Strategy is the main promoter of this*

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<sup>10</sup> Available at <https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/transport-plan>

*measure. The county council will develop proposals and funding bids for electric vehicle recharging points, determining appropriate locations e.g. workplaces, public car parks and on-street, future-proofing infrastructure as far as possible and encouraging take-up through demonstration schemes and promotional campaigns.*

### **3.2.4 Guildford Transport Strategy**

Guildford Transport Strategy<sup>11</sup> sets out a programme to address the historic infrastructure deficit and to mitigate the key transport impacts of proposed planned growth in the borough (and beyond). The Council is working closely with the key transport infrastructure and service providers to accelerate the development and delivery of appropriate improvements. These include Surrey County Council, as Local Highway Authority, Highways England, responsible for the A3 trunk road and M25 motorway, Network Rail and bus and community transport operators. There are a number of component strategies for specific issues, including transport and air quality, one of the outcomes of which is to ensure ‘*No requirement for Air Quality Management Areas in Guildford borough*’.

### **3.2.5 Guildford Air Quality Strategy**

The Guildford Air Quality Strategy<sup>12</sup> identifies key air quality issues within the Borough and sets out an approach to maintaining and improving air quality. A key aim of the strategy is to establish and maintain good working relationships with key stakeholders to achieve the air quality objectives. The priorities of the strategy are to set out a clear approach to air quality, monitor and report on air pollution, reduce vehicle emissions, work with other agencies, use the planning framework, reduce emissions at source and provide the public with information. There is overlap with the measures set out in the Air Quality Strategy with those in this AQAP for Shalford.

### **3.2.6 Sustainability**

The Guildford Development Framework includes a Sustainable Design and Construction, Supplementary Planning Document (SPD)<sup>13</sup>, in order to effectively implement Sustainable Development (including reducing emissions of climate change gases and adapting and mitigating climate change through a variety of measures). Some of the measures included in the SPD relate to transport and

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<sup>11</sup> Available at <https://www.guildford.gov.uk/newlocalplan/CHttpHandler.ashx?id=26649&p=0>

<sup>12</sup> Available at <https://www.guildford.gov.uk/newlocalplan/CHttpHandler.ashx?id=26585&p=0>

<sup>13</sup> Available at <https://www.guildford.gov.uk/article/16938/Sustainable-Design-and-Construction-SPD>

increasing the usage of alternative modes of transport to the private vehicle, such as walking and cycling through the provision of access for pedestrians and cyclists and implementation of car clubs.

## **3.1 National Policy Context**

### **3.1.1 Air Quality Strategy**

The Air Quality Strategy (Defra, 2007)<sup>14</sup> published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA) and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

### **3.1.2 Clean Air Strategy 2019**

The Clean Air Strategy (Defra, 2019a)<sup>15</sup> sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry.

### **3.1.3 Reducing Emissions from Road Transport: Road to Zero Strategy**

The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018)<sup>16</sup> in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe

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<sup>14</sup> Available at <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>

<sup>15</sup> Available at <https://www.gov.uk/government/publications/clean-air-strategy-2019>

<sup>16</sup> Available at <https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy>

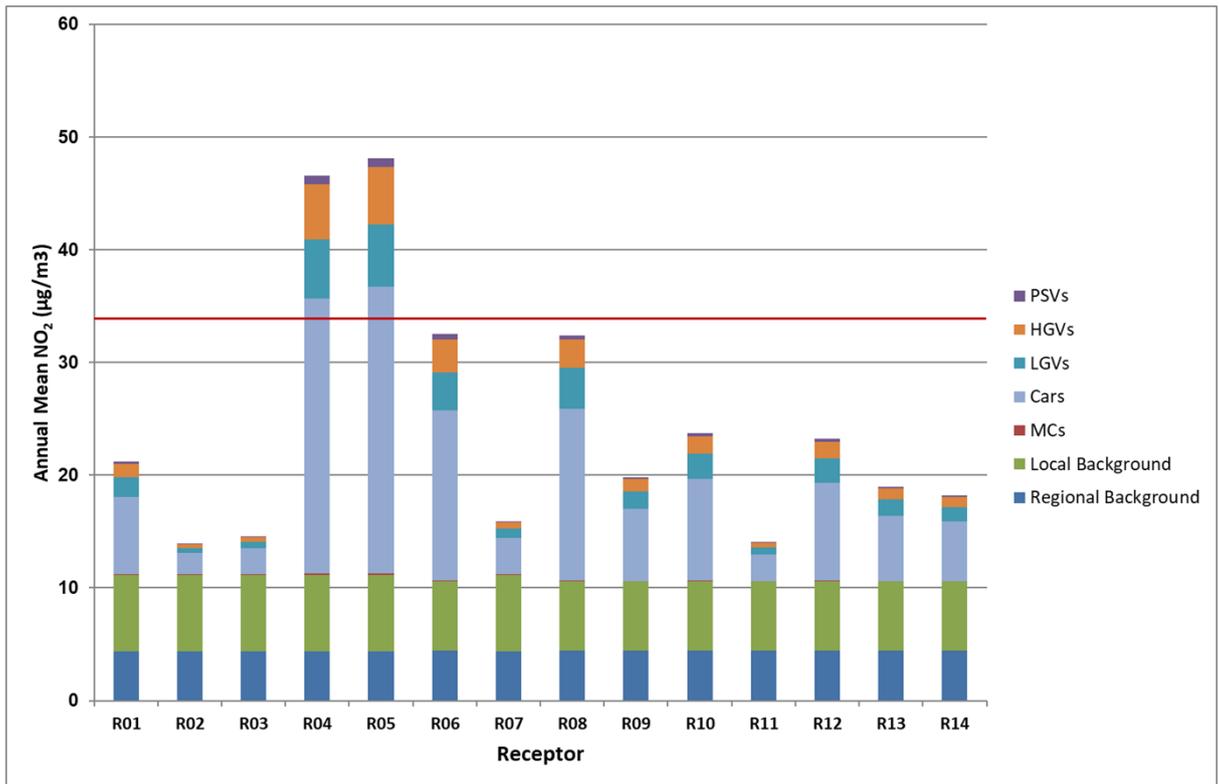
emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. If these ambitions are realised, then road traffic-related NOx emissions can be expected to reduce significantly over the coming decades.

### **3.2 Source Apportionment**

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Shalford.

A source apportionment exercise was carried out by GBC in 2018 on modelled concentrations at relevant receptors in Shalford. The total concentration of a pollutant comprises those from explicit local emission sources such as roads, and those that are transported into an area by the wind from further away. If all the local sources were removed, all that would remain is that which comes in from further away; it is this component that is called 'background', which in the figure below is split into those which are classed as local and those which are from further afield. Figure 2 shows the contribution from different vehicle types to NO<sub>2</sub> concentrations including background at those receptors. At all the locations in Shalford, the largest proportion of the resulting concentration is caused by emissions from cars. Figure 2 illustrates that measures targeted at buses (marked as PSV, Public Service Vehicles) are unlikely to be effective, and that measures targeted at cars will be required.



**Figure 2: Contributions of Different Sources to Total Predicted Annual Mean Nitrogen Dioxide Concentration (µg/m<sup>3</sup>) at Each Receptor in 2017**

### 3.3 Required Reduction in Emissions

The degree of improvement needed in order for the annual mean nitrogen dioxide objective to be achieved is defined by the difference between the highest measured or predicted concentration and the objective level (40 µg/m<sup>3</sup>).

In terms of describing the reduction in emissions required, it is more useful to consider nitrogen oxides (NO<sub>x</sub>). The required reduction in local nitrogen oxides emission has been calculated in line with guidance presented in LAQM.TG16 (Defra, 2018).

Table 3.1 – Improvements in Annual Mean NO<sub>2</sub> and NO<sub>x</sub> Concentrations Required in 2017 to Meet the Objective

Receptor	Required Reduction in Annual Mean NO <sub>2</sub>		Required Reduction in Road NO <sub>x</sub> Emissions	
	µg/m <sup>3</sup>	% of total predicted NO <sub>2</sub>	µg/m <sup>3</sup>	% reduction in road NO <sub>x</sub>
R04	6.6	14.1	15.9	21.1
R05	8.1	16.9	19.7	25.0

sets out the required reduction in local emissions of NO<sub>x</sub> that would be required at each of the receptor locations where an exceedance is predicted, in order for the annual mean objective to be achieved.

The highest nitrogen dioxide concentration has been predicted at receptor R05 (48.1 µg/m<sup>3</sup>), requiring a reduction of 8.1 µg/m<sup>3</sup> for the objective to be achieved. Table 3.1 – Improvements in Annual Mean NO<sub>2</sub> and NO<sub>x</sub> Concentrations Required in 2017 to Meet the Objective

Receptor	Required Reduction in Annual Mean NO <sub>2</sub>		Required Reduction in Road NO <sub>x</sub> Emissions	
	µg/m <sup>3</sup>	% of total predicted NO <sub>2</sub>	µg/m <sup>3</sup>	% reduction in road NO <sub>x</sub>
R04	6.6	14.1	15.9	21.1
R05	8.1	16.9	19.7	25.0

shows that at this location a reduction of 19.7 µg/m<sup>3</sup> in NO<sub>x</sub> emissions would be required in order to achieve the objective. This equates to a reduction of 25.0% in local road traffic emissions at this receptor location.

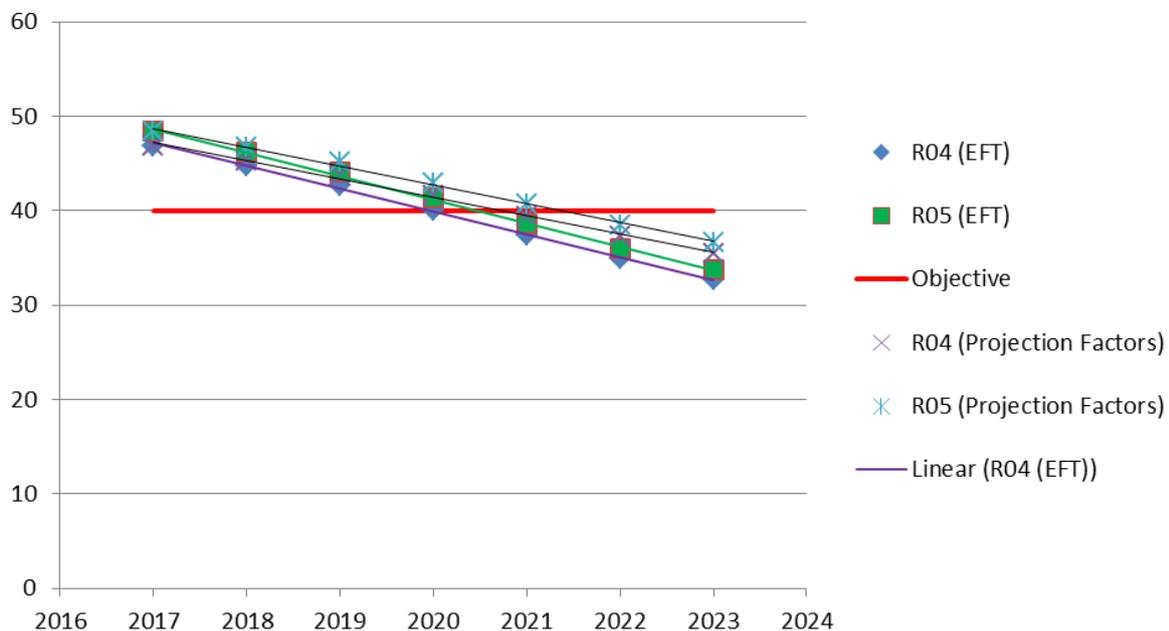
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	µg/m <sup>3</sup>	% of total predicted NO <sub>2</sub>	µg/m <sup>3</sup>	% reduction in road NO <sub>x</sub>
R04	6.6	14.1	15.9	21.1
R05	8.1	16.9	19.7	25.0

### 3.4 Year when objective is predicted to be achieved

A brief analysis has been undertaken to estimate when the objective may be achieved without any further intervention. It should be noted that this is not an accurate prediction but is based on factors provided by Defra for quantifying air quality concentrations in future years. The following graph shows reductions in concentrations at the two worst case modelled receptors, using two different

methods, Defra’s roadside NO<sub>2</sub> projection Factors<sup>17</sup> and using the Emission Factor Toolkit (EFT)<sup>18</sup> published by Defra.



**Figure 3: Projected Concentrations in Future Years at Receptors Predicted to Exceed Air Quality Objectives**

The graph shows that there is only a slight divergence between the prediction methods with the roadside projection factors predicting a slightly slower reduction. Based on modelled concentrations in 2017, at receptor R04, both methods predict compliance by 2021; at R05 the roadside projection factors don’t predict compliance until 2022.

Predicting pollutant concentrations in a future year will always be subject to uncertainty. It is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions.

European type approval (‘Euro’) standards for vehicle emissions apply to all new vehicles manufactured for sale in Europe. These standards have, over many years, become progressively more stringent and this is one of the factors that has driven reductions in both predicted and measured pollutant concentrations over time.

<sup>17</sup> <https://laqm.defra.gov.uk/tools-monitoring-data/roadside-no2-projection-factor.html>

<sup>18</sup> EFT Version 9 used for this analysis. <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>

Historically, the emissions tests used for type approval were carried out within laboratories and were quite simplistic. They were thus insufficiently representative of emissions when driving in the real world. For a time, this resulted in a discrepancy, whereby nitrogen oxides emissions from new diesel vehicles reduced over time when measured within the laboratory, but did not fall in the real world. This, in turn, led to a discrepancy between models (which predicted improvements in nitrogen dioxide concentrations over time) and measurements (which very often showed no improvements year-on-year).

Recognition of these discrepancies has led to changes to the type approval process. Vehicles are now tested using a more complex laboratory drive cycle and also through 'Real Driving Emissions' (RDE) testing, which involves driving on real roads while measuring exhaust emissions. For Heavy Duty Vehicles (HDVs), the new testing regime has worked very well and NO<sub>x</sub> emissions from the latest vehicles (Euro VI<sup>19</sup>) are now very low when compared with those from older models (ICCT, 2017)<sup>20</sup>.

For Light Duty Vehicles (LDVs), while the latest (Euro 6) emission standard has been in place since 2015, the new type-approval testing regime only came into force in 2017. Despite this delay, earlier work by AQC (2016)<sup>21</sup> showed that Euro 6 diesel cars manufactured prior to 2017 tend to emit significantly less NO<sub>x</sub> than previous (Euro 5 and earlier) models. Given the changes to the testing regime, it is reasonable to expect that diesel cars and vans registered for type approval since 2017 will, on average, generate even lower NO<sub>x</sub> emissions.

As well as reviewing information on the emissions from modern diesel vehicles in the real world (AQC, 2016), AQC has also reviewed the assumptions contained within Defra's EFT (v9.0) (AQC, 2019)<sup>22</sup>. One point of note is that the EFT makes a range of assumptions, which appear to be very conservative, regarding the continued use of diesel cars into the future and the relatively slow uptake of non-conventional (e.g.

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<sup>19</sup> Euro VI refers to HDVs while Euro 6 refers to LDVs.

<sup>20</sup> ICCT (2017) *NO<sub>x</sub> emissions from heavy-duty and light-duty diesel vehicles in the EU: Comparison of real-world performance and current type-approval requirements*, Available: <http://www.theicct.org/nox-europe-hdv-ldv-comparison-jan2017>.

<sup>21</sup> AQC (2016) *Emissions of Nitrogen Oxides from Modern Diesel Vehicles*, Available: <http://www.aqconsultants.co.uk/getattachment/Resources/Download-Reports/Emissions-of-Nitrogen-Oxides-from-Modern-Diesel-Vehicles-210116.pdf.aspx>.

<sup>22</sup> AQC (2019a) *Initial Comparison of EFT v9 with EFT v8 and CURED v3A*, Available: <http://www.aqconsultants.co.uk/AQC/media/Reports/Initial-Comparison-of-EFT-v9-with-EFT-v8-and-CURED-v3A-290519.pdf>.

electric) vehicles (AQC, 2018)<sup>23</sup>. Thus, despite previous versions of Defra's EFT being over-optimistic regarding future-year predictions, it is not unreasonable to consider that EFT v9.0 might under-state the scale of reductions over coming years (i.e. over-predict future-year traffic emissions).

Overall, it is considered that prior to 2021, the EFT provides a robust method of calculating emissions. While there is still some uncertainty regarding any predictions of what will occur in the future, there are no obvious reasons to expect predictions made using the EFT to under-predict concentrations in the future up to and including 2020.

### **3.5 Origin Destination Study**

Information from Origin Destination Surveys are useful for the action planning process in order to obtain data on where people are travelling from and for what reason. A survey was undertaken in May 2014 to gain further understanding of trips travelling through Guildford via the gyratory, of which the A281, which runs through Shalford, is one of the routes onto the gyratory. Four sites were chosen around the gyratory one-way system in the centre of Guildford. All sites show high percentages of journeys associated with work in both the AM and PM periods. Despite relatively high work journeys, there was increased variability amongst the other purposes in the inter-peak and PM periods, shopping being a major journey purpose. In addition, in the inter-peak and PM period, more trips are associated with leisure activities such as visiting friends, and recreation. Trip length has also been estimated, with an average trip length of 17.96 km. On average only 15% of journeys have the potential for modal shift. 10.5% of journeys could be classified as through trips. This data shows that measures will need to be targeted at work related car trips in particular, but there are only 15% of journeys which have the potential for modal shift.

### **3.6 Key Priorities**

Based on the evidence provided above, the following issues need to be considered when deciding on which measures are likely to be effective:

- The majority of emissions arise from cars, with some contribution from LGVs and HGVs;

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<sup>23</sup> AQC (2018a) *Development of the CURED v3A Emissions Model*, Available: <http://www.aqconsultants.co.uk/Resources/Download-Reports.aspx>.

- There is no decipherable contribution from point sources or industry;
- There is a very small contribution from buses;
- Origin Destination surveys suggest that a relatively small proportion of car trips (15%) have the potential for modal shift;
- Origin Destination surveys suggest that majority of trips in the morning and afternoon peak are work related. Journey purpose was more variable in the interpeak and included activities such as shopping, visiting friends and leisure activities; and
- Any measures which will take longer than 2023 to implement and have effect, are unlikely to bring forward compliance with the air quality objectives.

Because of the above points, it is going to be very difficult to implement a measure which will have a large enough impact to improve the situation in a short timescale. A number of measures have been discussed within the Action Planning process, anything implemented will need to be proportionate to the issue which has been identified, which is a very localised issue in relation to 8 properties in Shalford, which are located close to the road. The following sections outline measures which will be implemented, and those which require further investigation. Appendix B includes measures which have been discussed and discounted (and the reasons for being discounted).

## 4 Development and Implementation of Guildford Borough Council’s AQAP

### 4.1 Consultation and Stakeholder Engagement

In developing this AQAP, we have worked with other local authorities and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 4.1. Because the AQMA is small, with only 8 properties affected, all residents within the AQMA have been contacted regarding the AQMA declaration and, where possible, engaged with directly. In addition, a drop-in session in Shalford is likely to be held in the near future.

The response to our consultation stakeholder engagement is given in Appendix A.

**Table 4.1 – Consultation Undertaken**

Yes/No	Consultee
Yes	the Secretary of State
No	the Environment Agency
Yes	the highways authority
Yes	neighbouring local authorities (Waverley)
Yes	other public authorities as appropriate, such as Public Health officials
No	bodies representing local business interests and other organisations as appropriate

## **4.2 Steering Group**

The Air Quality Steering Group includes local authority officers across Guildford Borough Council, Surrey County Council and the neighbouring authority in Waverley (which is situated further south along the A281). The group includes Environmental Health Officers (Guildford Borough Council and Waverley Borough Council), planners (policy, transport and development control), local highways officers (district and county level) and Public Health professionals. A meeting was held on 18<sup>th</sup> July 2019 to discuss measures for inclusion within the Air Quality Action Plan and a useful dialog was had in relation to current and future practice, ideas for further measures and consultation as the AQAP is taken forward.

## 5 AQAP Measures

A number of measures and initiatives, which will improve air quality, or raise awareness, are already being implemented in the Guildford area. These are not focussed specifically in Shalford but will assist in reducing emissions more generally and increasing awareness of air quality, travel choice and choice of vehicle. These existing measures include:

- easitGUILDFORD<sup>24</sup>. This is a green travel network, which was launched in 2019, which currently has over 12 businesses signed up. There are benefits for employees to encourage car sharing and alternative travel to work, which include discounts on rail and bus travel, discounts on EV recharging, car sharing schemes, discounts on bikes and free car club membership.
- Electric buses. Guildford has introduced a fleet of nine electric buses for its park and ride service from car parks to the town centre to replace existing diesel buses on the routes. This is the first Park and Ride in the UK to operate using only electric buses.
- Surrey Air Alliance have delivered a Defra funded schools education project in AQMA areas. Around 40 schools in the County have taken part in the programme which included workshops on air quality, cycle training and an anti-idling campaign;
- Guildford Borough Council has introduced a Green Scheme, which enables owners of electric vehicles to apply for a Green Parking Permit free of charge, which gives discounted parking in car parks;
- Project Aspire, which aims to improve the health and well-being of Guildford residents and to reduce social inequality, is about providing leadership, encouragement and support to all communities. The projects include initiatives to reduce dependency on cars and educational programmes in schools;
- The Guildford-Godalming Greenway will link the two towns with a safe route suitable for people who are walking, cycling, using wheelchairs or families with children in pushchairs. The Guildford Local Committee, on 13 June 2018, adopted the Guildford-Godalming Greenway route into the Guildford Cycle Plan which is a Surrey County Council plan. At Guildford, the Greenway will link into the growing network of green routes around the town. The route does not have funding in place, but it is anticipated that developments would contribute to sections of the scheme.
- Guildford Borough Council is participating in iSCAPE (Improving the Smart Control of Air Pollution in Europe)<sup>25</sup> which works on integrating and advancing the control of air quality and carbon emissions in European cities in the context of climate change through the development of sustainable and passive air

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<sup>24</sup> See <https://www.easit.org.uk/network/easitGUILDFORD-23> for more details.

<sup>25</sup> <https://www.iscapeproject.eu/>

pollution remediation strategies, policy interventions and behavioural change initiatives.

- An Electric Vehicle charging network pilot study is planned and currently awaiting Local Enterprise Partnership funding.

Where feasible, and funding is available, these projects will be continued and enhanced.

In relation to Shalford specifically, the following groups of measures, as outlined by Defra and categorised for reporting to the EU, have been considered. A brief overview of this consideration is included in the table below:

**Table 5.1 – EU Measure Categories Considered in Guildford**

EU Measure Category	Current Practice in Guildford/ consideration for Shalford
Alternatives to Private Vehicle Use	Bus based Park and Ride already in place, now fully electric, but not of direct benefit to Shalford. GBC has adopted a policy to promote and facilitate home working, flexible start and finish times, compressed hours, mobile working and virtual meetings, and conference calls etc
Environmental Permits	Not relevant at this location.
Freight and Delivery Management	Freight not a major issue in Shalford and would be very difficult to target for minimal benefit, therefore not considered further.
Policy Guidance and Development Control	Regional groups already operating in Surrey. An Air Quality Strategy for Guildford already adopted. GBC work within the planning system to request air quality assessments where relevant and ensure mitigation measures are implemented where necessary. There are no major sites allocated in the Local Plan which will have an impact on Shalford. Sites in Waverley (such as the Dunsford Airfield and Cranleigh developments) are likely to have a greater impact than those within GBC, therefore joint working between the two authorities will be critical.
Promoting Low Emission Plant	Not a major issue at this location.
Promoting Low Emission Transport	<p>Green scheme parking fees for Electric vehicles in GBC car parks. Electric vehicles as part of GBC vehicle fleet.</p> <p>Currently Environmental Health recommends conditions to the Planning Services on developments above 10 dwellings to have infrastructure for electric vehicle charging in each house or 10% EV spaces for unallocated car parking spaces.</p> <p>The Council is considering introducing a requirement for new developments with allocated parking to provide one fast charge sockets per house and for unallocated parking, 20%</p>

	<p>of available spaces to be fitted with a fast charge socket.</p> <p>Discounted car parking facilities for electric and ultra-low emission vehicles<sup>26</sup>.</p>
Promoting Travel Alternatives	<p>GBC implemented easitGuildford, a green travel network, to promote alternative transport, car sharing, bike to work scheme, provision of lockers, changing facilities, shows to support cyclists, runners, walkers, promote P&amp;R scheme and non car use.</p>
Public Information	<p>This is being delivered through other projects such as easitGuildford and Project Aspire as outlined above.</p>
Traffic Management	<p>Traffic Management options have been discussed with Surrey County Council. Because it is a small AQMA consisting of 8 properties, on a strategic route into Guildford, it is difficult to implement traffic management on the road network in Shalford. Discussions have centred around moving the queues away from properties and reducing congestion but there is no clear feasible way that this could be undertaken without moving the issue elsewhere. Priority for people turning right at Pilgrims Way has also been discussed. This would potentially reduce queues further north on the A281, but it is unclear how this would impact on the properties within the AQMA specifically. The conversion of the roundabout south of Shalford into signals (which would also entail signalling the T junction at Broadford Road) has also been discussed. Although this may regulate flow in that location, it is unlikely to impact the AQMA. It was also suggested that the development at Dunsford Airfield could be used to implement a traffic management scheme, but there is no certainty as to when the highways works would be delivered, but it is estimated that Shalford Schemes would be delivered late 2023 and it is unclear what the effect will be on traffic within Shalford.</p>
Transport Planning and Infrastructure	<p>Cycle network improvements such as the Guildford to Godalming Greenway are proposed, but there is already a usable cycle route into Guildford from Shalford so may not encourage much further modal shift of work trips.</p>
Vehicle Fleet Efficiency	<p>Although GBC is promoting low emission public transport (particularly for the electric bus fleet for P&amp;R), for other vehicle types these measures would be difficult to target for vehicles specifically driving through Shalford. They are therefore not considered further for this Action Plan.</p>

Table 5.2 shows the GBC AQAP measures. It contains:

- a list of the actions that form part of the plan;
- the responsible individual and departments/organisations who will deliver this action;

<sup>26</sup> <https://www.guildford.gov.uk/article/17702/Parking-strategy>

- estimated cost of implementing each action (overall cost and cost to the local authority);
- expected benefit in terms of pollutant emission and/or concentration reduction;
- the timescale for implementation; and
- how progress will be monitored.

**NB:** Please see future ASRs for regular annual updates on implementation of these measures.

Table 5.2 – Air Quality Action Plan Measures

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Park and Ride	Alternatives to private vehicle use	Bus based Park and Ride	Surrey County Council	Not applicable yet	Unknown at present	Not yet set	n/a	Not yet implemented	Unknown at present	Suggested new site for Park and Ride in Shalford to intercept commuters and shoppers going into Guildford. Site at Stonebridge. Low emission buses would make this a very attractive option from air quality perspective, but would potentially take too long to implement and is not proportionate to the air quality issue.
2	Priority at Pilgrims Way to people turning right	Traffic Management	Strategic Highway Improvement	Surrey County Council	Not applicable yet	Unknown at present	Not yet set	n/a	Not yet implemented	Unknown at present	This is unlikely to impact the small section of the road which constitutes the AQMA; potentially not desirable as this may introduce additional traffic to Pilgrims Way and encourage diversions through residential areas.
3	Run a school intervention programme in Shalford	Promoting Travel Alternatives	School Travel Plans	GBC	2020	2020	Not yet set	No perceptible difference in concentrations	Not yet implemented	Unknown at present	Shalford Pre-school and infant school is a small school of approx. 90 pupils. Unlikely to have a large impact, but useful for increasing awareness of air quality and may encourage model shift

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4	easitGuildford Green Travel Network	Promoting Travel Alternatives	Workplace Travel Planning	GBC	Already being implemented	2018-Dependent on funding	Number of businesses/ participants	Not quantifiable	10 businesses in Guildford already signed up representing over 12,000 employees	Unknown	The intention is for the network to become self-funding
5	Increasing Electric Vehicles in the Fleet locally	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Surrey County Council	6/2019	Unknown at present	Not yet set	Not quantifiable	Not yet implemented	Unknown at present	Undertaken through Surrey Electric Vehicle Strategy (November 2018). Currently being updated. Timescales for implementation too early. Guildford chosen for pilot project with delivery of a share of 60-80 EV charge points. The project is subject to LEP funding which has not been obtained.
7	Consider Air Quality at pre-application and application stages of planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Environmental Health, GBC	Already being implemented	Ongoing	Numbers of applications with conditions relating to air quality	Not quantifiable		Ongoing	Ensure robust air quality assessments and allow for effective use of planning conditions

Guildford Borough Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8	Joint working with Waverley Borough Council, particularly on large developments like Dunsford	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Environmental Health, GBC	Already being implemented	Ongoing		Not quantifiable		Ongoing	The majority of large scale housing and mixed use developments in Waverley already have conditions to ensure that Electric Vehicle infrastructure is included in the development. Examples include Dunsfold Park, Knowle Lane, Cranleigh, Cranleigh Nurseries, Alford Road
9	Electric Bike Share Scheme – incorporate hub in Shalford	Promoting Travel Alternatives	Promotion of Cycling	GBC? Surrey County Council?	2020		Hub implemented in Shalford	Not quantifiable	None		We are not currently proposing a hub in Shalford as part of the Guildford Community Bike Share Scheme Phase A. If we wanted to do so, we would need to find additional capital funding for this or divert funding from the hubs already identified in the preferred network which was designed in order to maximise the use of the bike share scheme.

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
10	Bid for low emission bus scheme (Defra grant) or Clean Bus Technology Fund to increase number of low and ultra-low emission buses in Guildford	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Environmental Health, GBC	2017	2017-2020	Number of buses replaced or retrofitted	Unlikely to be large reduction in concentrations because buses not a large proportion of emissions	Successful bid for ultra-low emission buses in Guildford. Further review of grants available	2022	This work needs to be done in conjunction with Surrey County Council who has a close working relationship with the bus operators. This measure alone will not achieve compliance in the Shalford AQMA, but will have wider air quality benefits in combination with measures to encourage modal shift

## Appendix A: Response to Consultation

**Table A.1 – Summary of Responses to Consultation and Stakeholder Engagement on the AQAP**

Consultee	Category	Response
Surrey County Council Highways	Statutory Consultees	Informally consulted on the 8 August 2019 via the Steering Group
Waverley Borough Council	Statutory Consultees	Informally consulted on the 8 August 2019 via the Steering Group
Guildford Borough Council Local Plan Transport Team	Internal Consultees	Informally consulted on the 8 August 2019 via the Steering Group
Shalford Parish Council	Non-statutory Consultees	To be consulted on approval of draft
Highways England	Statutory Consultees	To be consulted on approval of draft
Public Health Surrey County Council	Statutory Consultees	To be consulted on approval of draft
Bus Companies	Non-statutory Consultees	To be consulted on approval of draft
Local residents	Non-statutory Consultees	To be consulted on approval of draft
Local schools	Non-statutory Consultees	To be consulted on approval of draft

## Appendix B: Reasons for Not Pursuing Action Plan Measures

**Table B.1 – Action Plan Measures Not Pursued and the Reasons for that Decision**

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Low Emission Zone/ Clean Air Zone	Measure to charge vehicles which do not achieve a specific emissions limit, suggestion related to HGVs and LGVs only.	This measure would have a long timescale for implementation and HGVs and LGVs not the main issue, and therefore would not be that effective. Not proportionate for the number of properties which are exceeding the air quality objective.
Train based Park and Ride (at Shalford Station)	Use of existing infrastructure to encourage people to stop at Shalford Train Station and take the train for the last portion of their journey to Guildford	Parking at station not extensive enough to incorporate a Park and Ride, no available land for further car parking. Trains also not frequent enough to attract users.
Other Park and Ride Facilities	Option for park and ride plus electric bike hub to facilitate low emission transport to the Guildford town centre and railway station.	Currently no available land has been identified in this vicinity; implementation period is likely to be in excess of the projected date of compliance with no measures.
Demolish old stone wall on other side of road to properties	This would reduce the canyon effect at the specific location within the AQMA.	Unlikely to be feasible in relation to the Shalford Conservation Area.
Opening up railway line to Cranleigh	The Cranleigh line was a linking railway line that connected Guildford with the West Sussex market town of Horsham on another line to the south coast. The line ran through Cranleigh and closed in 1965	Study done a few years ago showing this to be uneconomic. Would also have a long timescale for implementation and not proportionate to the number of properties which are exceeding the air quality objective
Traffic lights gating traffic to travel one way in each direction	This would allow one way flow of traffic (allowing the traffic to be kept further from the properties in question and reducing overall flow).	Would have very significant impact on journey times and congestion.

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
20 mph zone	Reduce the speed limit to allow vehicles to travel at a lower and more consistent speed through the AQMA. Speed reduction in some circumstances reduces vehicle emissions.	<p>Evidence relating to the impacts of 20mph zones suggest they are likely to result in negligible impacts and in some instances worsen air pollution. The National Institute for Health and Care Excellence (NICE) Guidance on outdoor air quality suggested that 20mph limits should be considered as an air quality improvement measure but the evidence supporting it was found to be weak. An evaluation of 20mph zones in London<sup>27</sup> suggested slowing traffic had no net negative impact on exhaust emissions, but improved driving style. In 20 mph zones vehicles moved more smoothly, with fewer accelerations and decelerations, than in 30mph zones. This smoother driving style reduces particulate emissions from tyre- and brake-wear. Modelled exhaust emissions based on measured speeds suggested 20mph zones had a mixed impact on emissions depending on the pollutant and the type of vehicle.</p> <p>It is recommended to carry out further study and monitoring of the existing vehicle speeds in the Shalford AQMA.</p>

## Glossary of Terms

<sup>27</sup> <https://www.cityoflondon.gov.uk/business/environmental-health/environmental-protection/air-quality/Documents/speed-restriction-air-quality-report-2013-for-web.pdf>

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQC	Air Quality Consultants
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Annual Status Report – annual report on air quality
COMEAP	Committee On the Medical Effects of Air Pollution
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emission Factor Toolkit
EU	European Union
GBC	Guildford Borough Council
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
ICCT	International Council on Clean Transportation
iSCAPE	Improving the Smart Control of Air Pollution in Europe
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
LGV	Light Goods Vehicle
LTP	Local Transport Plan
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
P&R	Park and Ride

Abbreviation	Description
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PSV	Public Service Vehicle
RDE	Real Driving Emissions
SPD	Supplementary Planning Document