Gravesham Borough Council

Air Quality Action Plan (2024 – 2029)

February 2025

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Gravesham Borough Council

Draft Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021

Local Air Quality Management

February (2025)

This Air Quality Action Plan supersedes:

Final Action Plan 2004 (Northfleet Industrial and A2 Trunk Road AQMAs)

Action Plan 2006 (Urban Road AQMAs)

Air Quality Strategy 2006

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Report Reference Number	2024 – 2029 AQAP
Date	February 2025

1 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 actions we will take to improve air quality in Gravesham Borough Council between 2024 – 2029 The AQAP sets out how the local authority will exercise its functions in order to secure the achievement of the air quality objectives.

This action plan is the final version and will be adopted from January 2025. Implementation of the outlined measures will result in the relevant objectives being attained by 2029.

The relevant Air Quality Management Areas (AQMAs) addressed by this action plan are outlined below:

- **AQMA No.1 – A2 Trunk Road** (An area extending either side of the length of the A2 within the borough);
    - NO_2 Annual Mean – Declared 2002, Amended 2012
- **AQMA No.3 – A226 One-way system in Gravesend** (An area incorporating the entirety of the A226 One-way system in Gravesend);
    - NO_2 Annual Mean – Declared 2005
- **AQMA No.4 – A227/B261 Wrotham Road/Old Road West Junction** (An area encompassing the junction of the A227 Wrotham Road and B261 Old Road West extending south to a point just beyond the Woodlands Restaurant);
    - NO_2 Annual Mean – Declared 2005

This action plan replaces the previous action plans published in 2004 and 2006 and the Air Quality Strategy published in 2006. Projects delivered through the past action plans include:

- Traffic Rerouting using Variable Message Signage (VMS) AND Traffic Management (UTMC and junction improvements) (A226 One way system Gravesend AQMA)
- HGV rerouting – Gravesend – Town Centre Road Network AQMA
- New road infrastructure (Rathmore Link Road)

- Road prioritisation (Bus priority)
- Public transport improvements (Fastrack)
- The development of supplementary planning guidance for air quality assessments of developments
- Traffic Management / Speed Regulation (Improved journey times with improved traffic flows)
- Reduction in PM_{10} emissions from combined impact of industrial processes in Northfleet
- Realignment of the A2 Trunk Road away from residential areas
- Revocation of Northfleet Industrial Area AQMA
- Revocation of Parrock Street AQMA
- Revocation of the A2 Trunk Road AQMA for Particulate Matter (PM10) 24 hour mean
- Revocation of Echo Junction AQMA
- Reduction in size of the A2 Trunk Road AQMA for Nitrogen dioxide

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, older people, pregnant women, 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[1,2].

The UK Health Security Agency (formally Public Health England) has estimated that the costs of air pollution in England to health and social care services could reach

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010

[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

between £5.3 and 18.6 billion between 2018 and 2035 [3]. Gravesham Borough Council is committed to reducing the exposure of people in Gravesham Borough Council to poor air quality in order to improve health.

We have developed actions that can be considered under 4 four broad topics:

- Improving emission standards for all fleets
- Strategic highway improvements
- Improvements in policy guidance and development control
- Public information access to support healthier lifestyles for residents

The priorities within this action plan intend to target transport emissions within the AQMAs through working with partners e.g. Kent County Council, local communities and businesses to aid a behavioural shift within the population to promote more sustainable and less polluting methods of transport. This should help to reduce dangerous pollutant concentrations and reduce the risk of detrimental impact on health and wellbeing within the district. In addition, where transport remains a major source of air pollution, traffic measures will be implemented to reduce congestion, aiming to reduce source emissions in areas of relevant exposure. The borough council intends to implement measures which set a positive example for others through implementing measures to control emissions from their own fleet.

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) 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 Gravesham Borough Council's direct influence.

[3] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Responsibilities and Commitment

This AQAP was prepared by Bureau Veritas and the Environmental Protection Team of Gravesham Borough Council with the support and involvement of the following departments who will be committed to the delivery of actions:

- Environmental Protection
- Climate Change / Air Quality Officer Working Group
- Corporate Services
- Licensing
- Parking Services
- Waste Management Services
- Planning Services
- Economic Development
- Housing Operations
- Highways, Kent County Council
- Public Health, Kent County Council
- Air Quality Team, National Highways

This AQAP has been approved by the Head of Community Protection and the Director of Public Health at Kent County Council. Further approval from Members at Cabinet Committee in November 2024 and the Action Plan adopted in January 2025.

This AQAP will be subject to an annual review and appraisal of progress. Progress each year will be reported in the Annual Status Reports (ASRs) produced by Gravesham Borough Council, as part of our statutory Local Air Quality Management duties.

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

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Table of Contents

List of Tables

List of Figures

2 Introduction

This report outlines the actions that Gravesham Borough Council will deliver between 2024 – 2029 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 Gravesham. The purpose of the report is to set out how the local authority will exercise its functions in order to achieve the relevant air quality objectives. This will be adopted from January 2025.

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, as amended by the Environment Act 2021, 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 Gravesham Borough Council's air quality ASRs.

3 Summary of Current Air Quality in Gravesham Borough Council

3.1 Air Quality Management Areas

The relevant Air Quality Management Areas (AQMAs) addressed by this AQAP are outlined below.

Table 3.1 includes the nature of the exceedances for which the AQMAs were declared and describe the margin of exceedances, maps showing the location of AQMAs, and monitoring sites are shown in Figure 3.1 – Figure 3.3.

Table 3.1 – Relevant Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year (2022)	Number of Years Compliant with Air Quality Objective
Gravesham A2 AQMA	Declared 2002, Amended 2012	NO_2 Annual Mean	The A2 Trunk Road AQMA. An area extending either side of the length of the A2 within the borough.	YES	50.5 µg/m^3	42.9 µg/m^3 (32.2 µg/m^3)	1
Gravesham A226 One-way system AQMA	Declared 2005	NO_2 Annual Mean	An area incorporating the entirety of the A226 One-way system in Gravesend.	NO	57.4 µg/m^3	-	0
Gravesham A227 Wrotham Road/ B261 Old Road West AQMA	Declared 2005	NO_2 Annual Mean	An area encompassing the junction of the A227 Wrotham Road and B261 Old Road West extending south to a point just beyond the Woodlands Restaurant	NO	47.3 µg/m^3	-	1
Note: within brackets reports concentrations subject to fall off with distance calculations							

Gravesham Borough Council have undertaken automatic monitoring at 2 sites and non-automatic monitoring at 66 sites, inclusive of 5 triplicate sites. In March 2024 the site ZG3 associated with the recently revoked Northfleet Industrial AQMA was decommissioned following 15 years of compliance with the annual mean objective for Particulate matter PM10. Maps showing the location of AQMAs, and monitoring sites within or near to the AQMAs are shown in Figure 3.1 to Figure 3.3.

Figure 3.1 – Map of Monitoring Sites Within/Near AQMA No.1: Gravesham A2

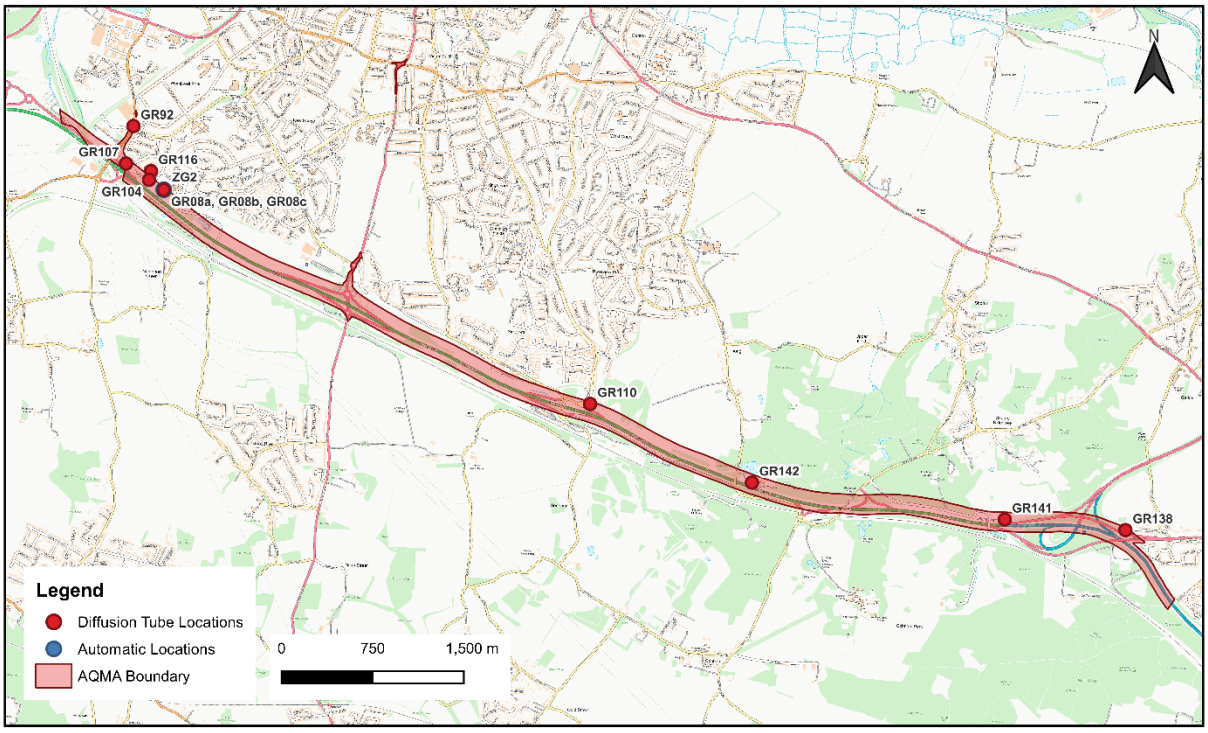


Figure 3.2 – Map of Monitoring Sites Within/Near AQMA No.3: A226 One-Way System, Gravesend

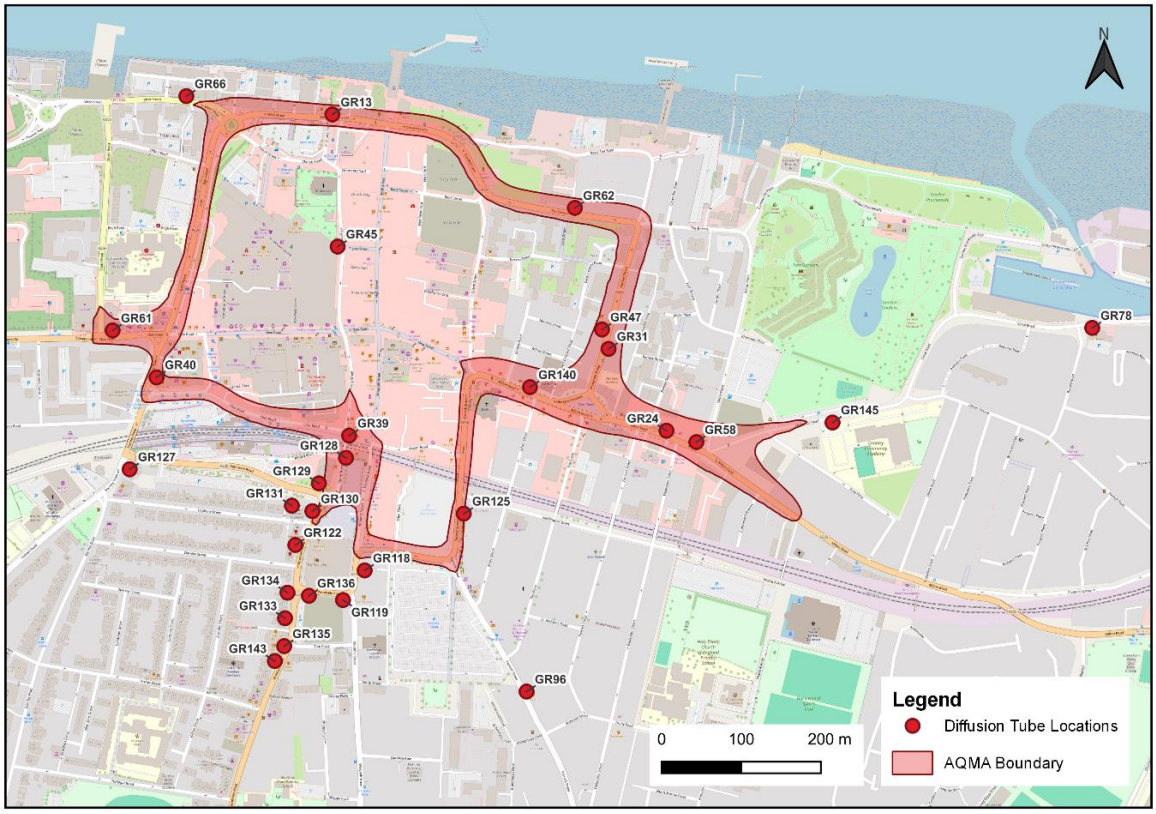
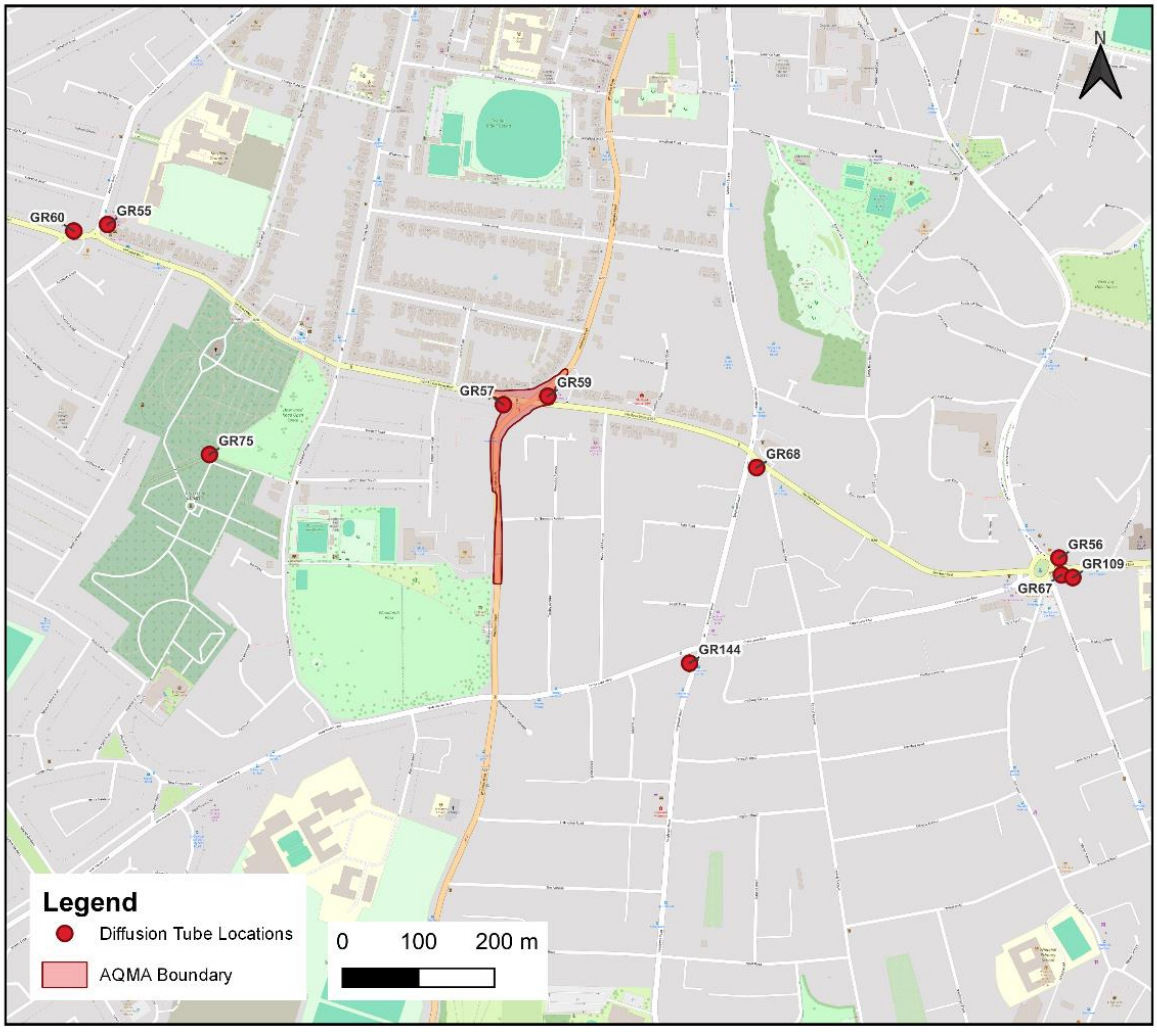


Figure 3.3 – Map of Monitoring Sites Within/Near AQMA No.4: A227/B261 Wrotham Road/Old Road West Junction



3.2 Review of Air Quality Monitoring

3.2.1 Local Automatic Monitoring

Gravesham Borough Council undertook automatic (continuous) monitoring at 2 sites. ZG2 is the only automatic monitoring location, located within an AQMA (A2 Trunk Road).

Table 3.2 – Table 3.5 compares the ratified and adjusted monitored NO_2 annual mean, PM_{10} annual mean and the PM_{10} 24-hour mean concentrations for the past five years with the air quality objective of 40 µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e., the values are exclusive of any consideration to fall-off with distance adjustment).

Table 3.2 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
ZG2	562589	172076	Roadside	29.9	29.1	23.7	22.8	22.2

Table 3.3 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200 µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
ZG2	562589	172076	Roadside	0	0	0	0	0

Table 3.4 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
ZG2	562589	172076	Roadside	15.4	15.3	16.3	16.0	15.3

Table 3.5 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50 µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
ZG2	562589	172076	Roadside	1	1	0	0	1

The automatic monitoring site within Gravesham's AQMA continues to report compliance of the AQS objectives for NO_2 and PM_{10}.

3.2.2 Local Non-Automatic Monitoring

Gravesham Borough Council undertook non-automatic (i.e., passive) monitoring of NO_2 at 66 sites, inclusive of 5 triplicate sites.

3.2.3 AQMA No.1 (A2 Trunk Road)

AQMA No.1 is currently declared for exceedances of the annual mean NO_2 AQS objective of 40µg/m^3, with the current boundary covering the A2.

As of 2022, there are currently 9 diffusion tube monitoring sites located within the boundary of AQMA No.1. The annual mean NO_2 concentrations reported at all sites within this AQMA over the past 5 years is presented in Table 3.6.

Monitored exceedances of the annual mean NO_2 AQS objective (40µg/m^3) have been reported from 2018 to 2020 at GR142. As the sites are not at a location of relevant exposure a fall off with distance correction was applied. Considering the concentration at relevant exposure, the exceedances of the annual mean NO_2 AQS objective at a location of relevant exposure reduce to 43.3 µg/m3 (2018), 42.9 µg/m^3 (2019), 34.8 µg/m^3 (2020), 31.5 µg/m^3 (2021) and 32.2 µg/m^3 (2022).

According to the LAQM TG(22), an AQMA is compliant when the annual mean NO_2 concentrations are lower than 36 µg/m^3 (i.e. within 10% of the annual mean NO_2 objective) for three consecutive representative years. Compliance being reached in 2020 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19 and associated lock down measures. As there has been exceedances in 2019, the years 2020 and 2021 cannot be considered representative. AQMA No.1 has been compliant for the year 2022, therefore currently there has only been 1 year of compliance.

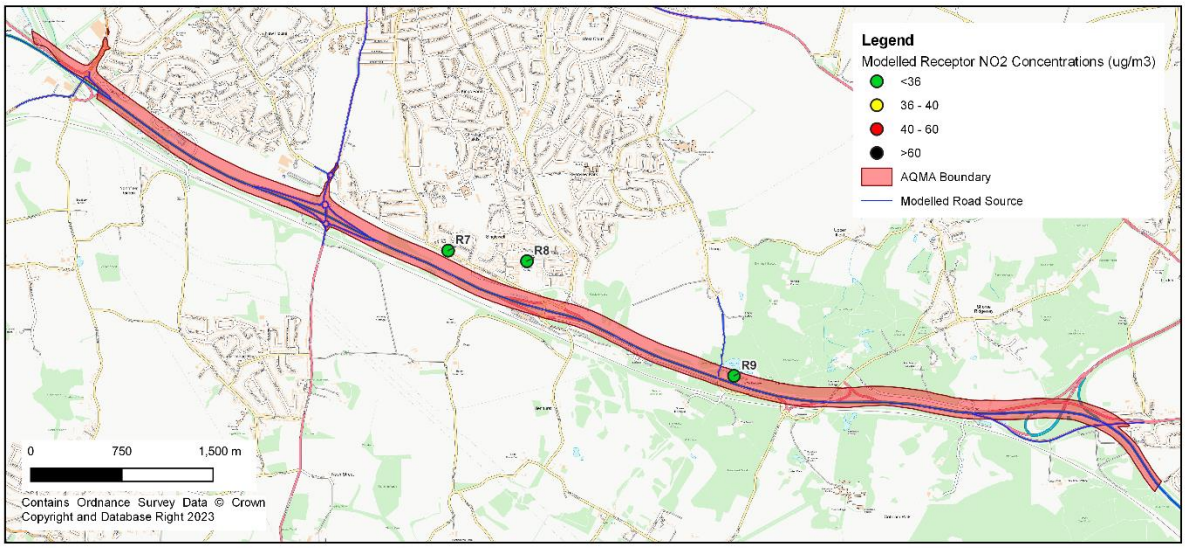
Table 3.6 – AQMA No.1 Annual Mean NO_2 Monitoring Concentrations (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
GR08a, GR08b, GR08c	562589	172076	Roadside	30.4	30.9	24.3	23.9	22.4
GR92	562323	172589	Roadside	36.9	38.6	33.3	33.0	29.0
GR104	562465	172153	Roadside	33.4	34.2	29.2	28.3	26.9
GR107	562272	172281	Roadside	35	36.3	30.6	29.8	27.7
GR110	566149	170436	Roadside	35.3	38.7	32.1	29.7	28.3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
GR116	562480	172225	Roadside	32.2	32.3	28.3	29.3	26.3
GR138	570583	169549	Roadside	28.8	30.2	25.3	24.1	24.8
GR141	569588	169603	Roadside	29.3	27.1	25.2	22.5	21.2
GR142	567500	169836	Roadside	**55**	**59.8**	**46.1**	**41.1**	**42.9**
*Exceedances of the NO_2 annual mean objective of 40 µg/m^3 are shown in **bold**.*								

Within the detailed modelling assessment, receptors were positioned at existing residential receptor locations both within the AQMA and in the near vicinity. Figure 3.4 displays the modelled receptors where all location were predicted to be below 36 µg/m^3 in 2022.

Figure 3.4 – Map of AQMA No.1, Modelled Receptors NO_2 Concentrations



3.2.4 AQMA No.3 (A226 One-way system in Gravesend)

AQMA No.3 is currently declared for exceedances of the annual mean NO_2 AQS objectives of 40µg/m^3, with the current boundary covering the one-way system within Gravesend.

As of 2022, there are currently 28 diffusion tube monitoring sites located within the boundary of AQMA No.3. The annual mean NO_2 concentrations reported at all sites within this AQMA over the past 5 years is presented in Table 3.7.

Monitored exceedances of the annual mean NO_2 AQS objective (40µg/m^3) have been reported from 2018 to 2021 at 7 sites. During 2022 all sites report concentrations below 40 µg/m^3, with 2 sites reporting concentration within 10% of the NO_2 AQS objective. GR13 in West Street was subject to fall off with distance calculations due to not being located at a site of relevant exposure. Under calculations, concentrations at GR13 still remains within 10% of the NO_2 AQS objective reporting a revised concentration of 37.5 µg/m^3.

As there has been exceedances in 2019, the years 2020 and 2021 cannot be considered representative. AQMA No.3 has not reached full compliance of present with 2 monitoring locations still reporting concentrations within 10% of the NO_2 AQS objective in 2022, but currently remains compliant to the 40µg/m^3 AQS objective. The estimated year of compliance for AQMA No.3 would be 2025 at the earliest, which takes into consideration compliance from 2023 onwards.

Table 3.7 – AQMA No.3 Annual Mean NO_2 Monitoring Concentrations (µg/m^3)

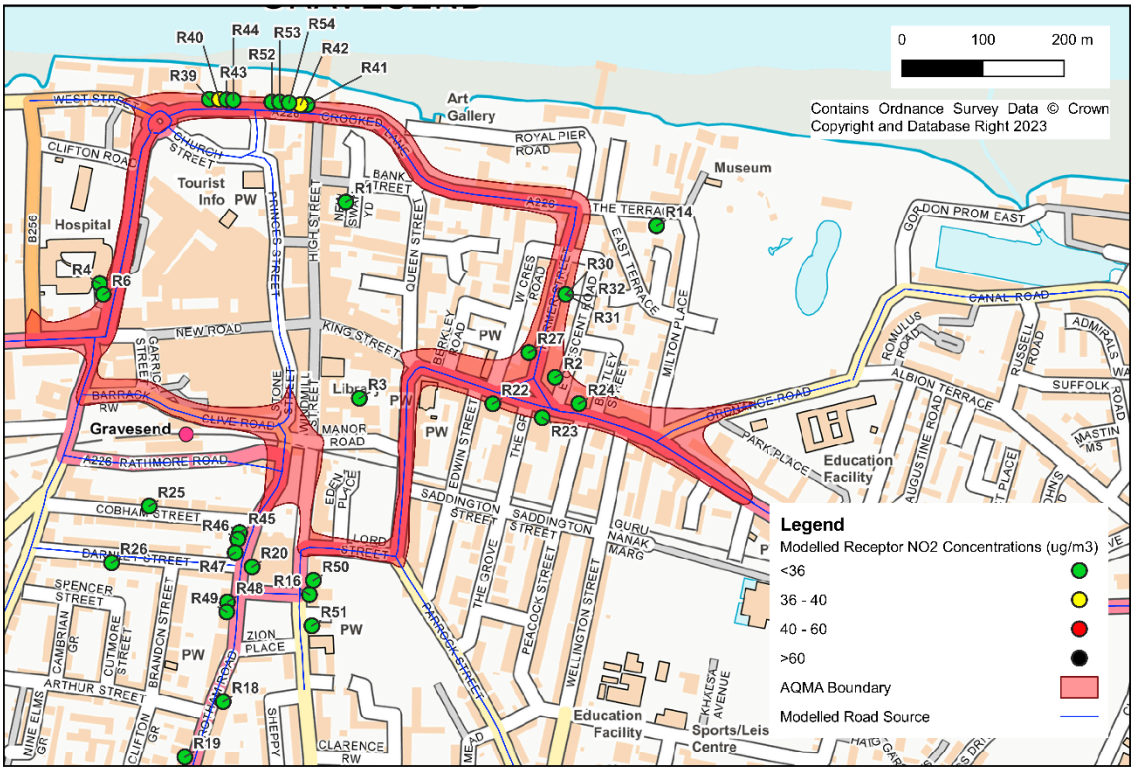
Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
GR13	564696	174431	Roadside	**47.1**	**46.1**	38	**41.2**	37.6
GR24	565128	174049	Roadside	**45.4**	**42.7**	36.7	**40.0**	35.0
GR31	565052	174149	Roadside	**42.9**	**43.7**	38.2	37.4	34.0
GR39	564730	174030	Roadside	35.8	35	28.3	31.0	29.3
GR40	564486	174095	Roadside	**45.2**	**43.4**	35	38.3	35.3
GR45	564708	174266	Roadside	27	29.3	24.1	24.4	21.7
GR47	565043	174173	Roadside	**45.4**	**42.9**	36.3	**41.0**	35.0
GR58	565166	174036	Roadside	37.6	38	31.2	33.0	31.6
GR61	564429	174152	Roadside	35.5	35.1	27.7	30.7	30.2
GR66	564512	174448	Roadside	31.9	31.6	27.9	28.2	26.3
GR78	565658	174195	Roadside	31.3	32.5	26.2	27.5	26.9
GR96	564963	173717	Roadside	32.4	31.4	27.3	25.5	25.0
GR118	564755	173862	Roadside	34.8	34.9	29	30.9	30.3
GR119	564729	173824	Roadside	**53.4**	**49.5**	37.6	**41.7**	39.4
GR122	564667	173891	Roadside	36.1	37	30.7	32.6	31.4
GR125	564877	173937	Roadside	32.1	33.2	27.5	29.6	28.3
GR127	564456	173979	Roadside	30.1	30.4	24.9	26.6	24.0
GR128	564727	174002	Roadside	30.9	31.8	26	29.6	26.0
GR129	564694	173969	Roadside	27.8	28.4	24.7	25.0	23.4
GR130	564687	173934	Roadside	30.6	31.3	26	27.0	25.7
GR131	564661	173940	Roadside	24.9	26.4	22.5	22.1	21.8
GR133	564657	173799	Roadside	36.3	36.2	28.7	28.3	27.5
GR134	564659	173831	Roadside	32.8	33.7	24.9	25.2	27.6
GR135	564657	173764	Roadside	**44.8**	**43.9**	36.8	35.7	31.1
GR136	564686	173828	Roadside	39.3	37.4	32.3	31.1	30.1
GR140	564955	174098	Roadside	38.1	38.5	33.7	34.2	30.8
GR143	564646	173745	Roadside	36.6	37	29.5	29.0	28.2
GR145	565336	174066	Roadside	32.2	30.6	28.9	29.6	29.3
*Exceedances of the NO_2 annual mean objective of 40 µg/m^3 are shown in **bold**.*								

Modelled receptors were positioned at existing residential receptor locations both within the AQMA and in the near vicinity. Figure 3.5 displays the 2022 modelled receptors. All modelled receptors reported concentrations below the NO_2 AQS objective, with no exceedances present in 2022. No exceedances were predicted to be outside of the AQMA boundary.

Two receptors located on A226 West Street have modelled concentrations within 10% of the NO_2 AQS objective, these are receptors R40 and R42, monitoring locations

GR13 is located ~53m from R40 and ~48m from R42, within 2022 GR13 reported concentrations within 10% at 37.5 µg/m^3 (distance corrected).

Figure 3.5 – Map of AQMA No.3, Modelled Receptors NO_2 Concentrations



3.2.5 AQMA No.4 (A227/B261 Wrotham Road/Old Road West Junction)

AQMA No.4 is currently declared for exceedances of the annual mean NO_2 AQS objectives of 40µg/m^3, with the current boundary covering the A227 Wrotham Road/ B261 Old Road West junction.

As of 2022, there are currently 2 diffusion tube monitoring sites located within the boundary of AQMA No.4. The annual mean NO_2 concentrations reported at all sites within this AQMA over the past 5 years is presented in Table 3.8.

Monitored exceedances of the annual mean NO_2 AQS objective (40µg/m^3) have been reported in 2019 at GR57.

Compliance being reached in 2020/2021 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19 and associated lock down measures. As there has been exceedances in 2019, the years 2020 and 2021 cannot be considered representative. AQMA No.4 has been compliant for the year 2022, therefore currently there has only been 1 year of compliance.

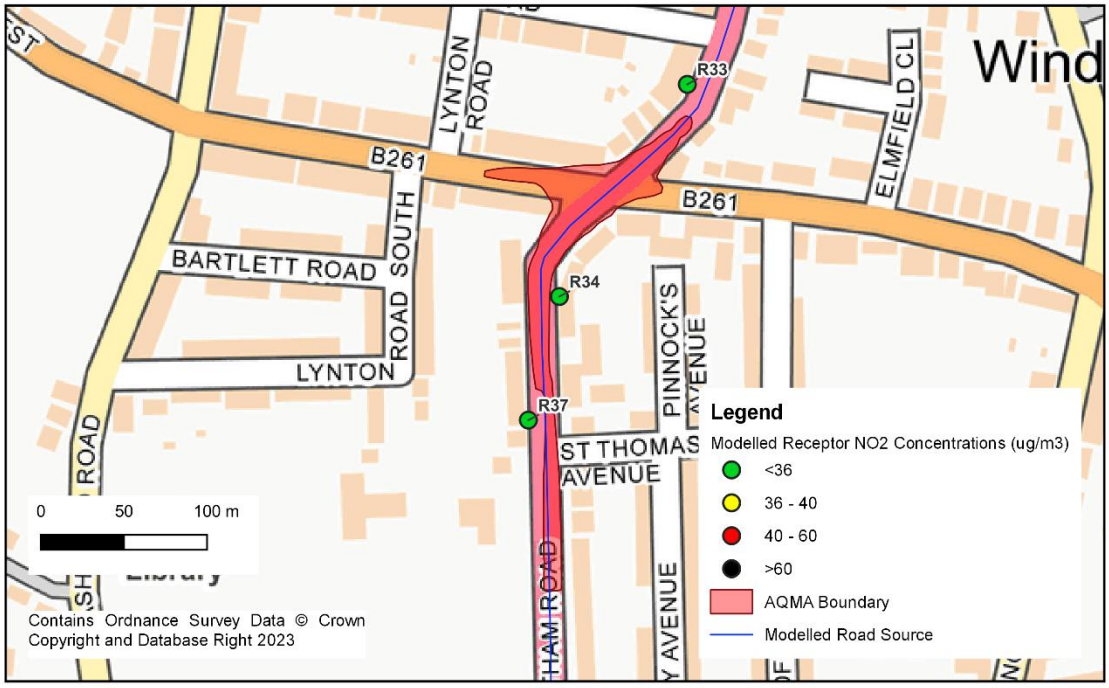
A third diffusion tube monitoring site commenced in December 2023 to assist in the assessment of the compliance in this AQMA.

Table 3.8 – AQMA No.4 Annual Mean NO_2 Monitoring Concentrations (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022
GR57	564472	173158	Roadside	38.4	40.2	31.1	33.7	31.7
GR59	564530	173171	Roadside	39.5	37.7	30.2	32.4	28.7
*Exceedances of the NO_2 annual mean objective of 40 µg/m^3 are shown in **bold**.*								

Modelled receptors were positioned at existing residential receptor locations both within the AQMA and in the near vicinity. Figure 3.6 displays the modelled receptors in 2022. All modelled receptors reported concentrations below the NO_2 AQS objective, with no exceedances present in 2022. No exceedances were also predicted to be outside of the AQMA boundary.

Figure 3.6 – Map of AQMA No.4, Modelled Receptors NO_2 Concentrations



3.3 Public Exposure

To understand the number of the population exposed to poor air quality, a review of the estimated population of each AQMA has been undertaken. This has been completed using the Office for National Statistics 'Lower Super Output Area' (LSOA) information. Information from the Indices of Multiple Deprivation (IMD) are also included.

The number for the IMD are based on deciles of multiple factors of deprivation. The larger the score, the more deprived the area.

Table 3.9 – Population Exposure within Gravesham AQMAs

AQMA	Estimated Population in AQMAs	Average IMD within AQMA	Median Age
AQMA No.1	218	7	49
AQMA No.3	1828	2	36
AQMA No.4	9	6	42

As shown in Table 3.9, all 3 AQMAs have different average IMD values, with AQMAs No.1 and No.4 having an average IMD of 7th and 6th Decile (out of 10), indicating that they are in more deprived areas. More deprived areas tend to have worsened air quality, with the demographic in both AQMAs No.1 and No.3 having a higher median age, older members of the public will be impacted more by poor air quality. AQMA No.3 has the highest IMD, indicating that they are in a lesser deprived area. The median age for all of Gravesham is 39 and for England 42. The Gravesend One Way System AQMA has a younger population, with the A2 Trunk Road AQMA having an older population compared to the national ages respectively.

The figures for the estimated population within the three AQMAs were derived from the number of properties within each AQMA, provided by the council's Planning Service and the average household size in Kent provided by Kent County Council (2.39 people) https://www.kent.gov.uk/about-the-council/information-and-data/facts-and-figures-about-Kent/summary-of-kent-facts-and-figures#tab-1,2,3

4 Gravesham Borough Council's Air Quality Priorities

4.1 Public Health Context

Mounting scientific evidence shows the scale of the impact of poor ambient air quality on health. In December 2020, the first case of air pollution being ruled as the cause of death was recorded for nine-year old, Ella Kissi-Debrah as a result of failure to reduce pollution levels to legal limits within the London Borough of Lewisham. Poor air quality is considered to be a significant contributory factor to the loss of life, shortening lives by an average of 5 months. The Committee on the Medical Effects of Air Pollution (COMEAP)[4] provides advice to Government on the setting of air quality standards, and increasingly has sought to consolidate evidence on the health burden and impacts of various pollutants, both in single occurrence and pollutants in combination. The current range of estimate for annual mortality burden for man-made air pollution in the UK is estimated to be between 28,000 – 36,000 deaths.

Local authorities have a range of powers which can effectively help to improve air quality. However, the involvement of public health officials is crucial in playing a role to assess the public health impacts and providing advice and guidance on taking appropriate action to reduce exposure and protect the health of people in Gravesham Borough Council.

The Air Quality Indicator in the Public Health Outcomes Framework (England) provides further impetus to join up action between the various local authority departments which can impact on the delivery of air quality improvements. The "Air Quality – A Briefing for Directors of Public Health" document published in March 2017 provides a one-stop guide to the latest evidence on air pollution, guiding local authorities to use existing tools to appraise the scale of the air pollution issue in its area. It also advises local

[4] https://www.gov.uk/government/collections/comeap-reports

authorities how to appropriately prioritise air quality alongside other public health priorities to ensure it is on the local agenda.

The document comprises the following key guides:

- Getting to grips with air pollution – the latest evidence and techniques
- Understanding air pollution in your area
- Engaging local decision-makers about air pollution
- Communicating with the public during air pollution episodes
- Communicating with the public on the long-term impacts of air pollution
- Air Pollution: an emerging public health issue: Briefing for elected members

Besides NO_2, there is an increasing focus on fine particulate matter. $PM_{2.5}$ is a pollutant of concern meaning particulate matter which is 2.5 microns or less in diameter. The AQMAs have not been declared for $PM_{2.5}$ and the modelling as part of the detailed assessment has shown predicted levels below the annual mean objective of 20µg/m³.

The Department of Health's Public Health Outcomes Framework[5] has a number of public health indicators that are used for public health actions, to identify areas of health inequality and concern, and monitor the differences in health impacts across regions in the UK. This framework includes an indicator "D01- Fraction of Mortality Attributable to Particulate Air Pollution" which is calculated using background annual average $PM_{2.5}$ concentrations, modelled at a $1km^2$ resolution based on measured concentrations from the AURN. Gravesham has a 5.5% fraction of mortality calculated for 2022, which is in line with the average for England overall (5.5%), and above the South East Region (5.1%). The 2022 data is presented as the 2023 dataset has not been made available at the time of writing, and is available via the Fingertips Public Health Outcomes Framework website.

Furthermore, following a review of research into the mortality burden associated with the air pollution mixture rather than single pollutants acting independently, the

[5] Public Health Outcomes Framework: D01- Fraction of Mortality Attributable to Particulate Air Pollution

Committee on the Medical Effects of Air Pollutants (COMEAP) are reviewing the legitimacy of linking deaths to one specific pollutant.

The "Improving outdoor air quality and health: review of interventions"[6] document published in March 2019 provides a comprehensive overview of actions that national and local government and others can take to improve air quality and health.

The review recommends prioritising the prevention or reduction of polluting activities (emission reduction), in preference to only taking steps to reduce air pollution once it has occurred (concentration reduction) or relying on avoidance (exposure reduction). The review also recommends that Plans consider and include actions that deliver co-benefits for people's wider health and wellbeing, such as increases in physical activity, improvements in housing and enhancements of green spaces.

In addition to these two general principles the review sets out a number of general principles and recommendations:

1. Take a whole system approach (address all air pollutants together and work across different sectors).
2. Consider a range of interventions together and include smaller actions: they can add up.
3. Focus on reducing people's long-term exposure to air pollution, but consider short term exposures and additional action during episodes of poor air quality.
4. Seek to lower population-level exposure and reduce everyone's exposure to air pollution, as well as targeting 'hotspots' (the most polluted areas).
5. Reduce air pollutants below Air Quality Limits – lowering exposures to particulate matter and nitrogen dioxide will improve people's health because there is no evidence of a threshold for health effects.
6. Consider the most vulnerable parts of the population and address inequalities in exposure to air pollution and adverse health outcomes.

[6] https://assets.publishing.service.gov.uk/media/5fbf93258fa8f559dbb1add9/Review_of_interventions_to_improve_air_quality_March-2019-2018572.pdf

7. Help people understand the impacts of air pollution and what they can do to reduce their exposures, using recognised behavioural frameworks if implementing behavioural interventions.
8. Plan for ‘clean by design’ places where people’s exposure to air pollution is minimised in future, as well as addressing the present.
9. Evaluate your interventions and share the findings with others – both of interventions that were effective and those that were not.

4.2 Planning and Policy Context

This Action Plan outlines the Council’s plan to effectively tackle air quality issues within its control; however, it is recognised there are numerous existing and impending policies and strategies adopted at local, regional, and national level that can exert significant effects, both positive and negative, on air quality across Gravesham Borough Council. It is important that these plans and strategies are identified and taken into consideration at an early stage in the development of the plan. These will aid the establishment of the context in which specific options for improving air quality can be implemented.

Whilst certain policies and / or strategies may be outside of the influence of Gravesham Borough Council, there are a number of related policies and strategies at local and regional levels that can be tied directly with the aims of this AQAP. Some of these are directly focused on air quality improvements within Gravesham Borough Council, whilst others relate to transportation issues and therefore have the added benefit of contributing to overall improvements in air quality across the borough.

Reviewing these strategies and policies can help to prevent duplication of work within the AQAP, enabling a focus on any additional measures that can be taken, that contribute to the overall aims of the AQAP (and potentially other strategic objectives), This section outlines the strategies and policies that have the most significant potential to impact on pollutant concentrations within Gravesham Borough Council. Given their importance, the majority of measures listed below have also been included as action measures within this Action Plan.

The most relevant policies and strategic documents are detailed below.

4.2.1 Clean Air Strategy 2019

The Clean Air Strategy[7] sets out the case for action at a national level, identifying a number of sources of air pollution within the UK including road transportation (relevant in terms of the AQMAs currently present within Gravesham). It also sets out the actions required to reduce the impact upon air quality from these sources. It has been developed in conjunction with three other UK Government Strategies; the Industrial Strategy, the Clean Growth Strategy, and the 25 Year Environment Plan.

Key actions that are detailed within the strategy aimed at reducing emissions from transportation sources include the following:

- The publication of the Road to Zero strategy, which sets out plans to end the sale of new conventional petrol and diesel cars and vans by 2040
- New legislation to compel vehicle manufacturers to recall vehicles and non-road mobile machinery for any failures in emission control systems, and to take effective action against tampering with vehicle emissions control systems
- Develop new standards for tyres and brakes to reduce toxic non-exhaust particulate emissions from vehicles. [NB: This action would not necessarily target reductions in NO_2 for which the AQMAs have been declared].
- The encouragement of the cleanest modes of transport for freight and passengers
- Permitting approaches for the reduction of emissions from non-road mobile machinery, especially in urban areas

4.2.2 Air Quality Strategy 2023

In April 2023, the Air Quality Strategy[8] was fully published and superseded the Air Quality Strategy (2008).

[7] Department for Environment, Food and Rural Affairs (2019), Clean Air Strategy

[8] https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery

This strategy sets out a framework to enable local authorities to deliver for their communities and contribute to our long-term air quality goals, including our ambitious new targets for fine particulate matter ($PM_{2.5}$).

The local government has an essential role to play in delivering cleaner air for communities and nature right across England. They have many of the powers and local insight to tackle issues that cause pollution locally. Local authorities (the lower tier in two-tier areas, and unitary authorities) already have a duty to address air quality exceedances in their area. This includes declaring Air Quality Management Areas and publishing Air Quality Action Plans setting out the measures they will take to come back into compliance. We also expect local authorities to take preventative action, through a local Air Quality Strategy, rather than waiting for a legal limit to be breached.

- Under the Local Air Quality Management framework, local authorities must assess their air quality for the specified pollutants and submit their Annual Status Reports.
- Local authorities must declare an Air Quality Management Area if concentrations are above legal limits or are likely to breach limits.
- Each Air Quality Management Area must be accompanied by an Air Quality Action Plan, setting out measures to fix the problem, and dates by which they will be carried out.
- Where causes of, or contributors to, an Air Quality Management Area fall within the control of another relevant body, those bodies should contribute measures to the Air Quality Action Plan and carry out those measures.
- All local authorities are expected to take proactive action to improve air quality, whether or not they have an Air Quality Management Area. Local authorities without an Air Quality Management Area, should specify proactive measures they will take in their Air Quality Strategy.
- Local authorities' Air Quality Strategies should be informed by their monitoring and assessments. Air Quality Strategies should set out an enforcement strategy which prioritises reduction of population exposure, including in areas experiencing disproportionately high levels of pollution.

- Directors of Public Health should be involved in the preparation of Air Quality Action Plans and Air Quality Strategies.

4.2.3 UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations

Published in July 2017, the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)[9] is the UK governments plan for bringing concentrations of NO_2 within statutory limits within the shortest possible time. It identifies that the most immediate air quality challenge within the UK is tackling the issue of NO_2 concentrations close to roads, especially within towns and cities. The plan identifies a number of local authorities that were required to complete feasibility studies to define NO_2 concentrations on road links which were identified by the national Pollutant Climate Mapping (PCM) model as exceeding the NO_2 annual mean AQS objective.

The UK Plan details a range of possible solutions to reduce NOx emissions from vehicles, and therefore lower NO_2 concentrations. The actions detailed within the UK Plan include:

- Implementation of Clean Air Zones (CAZs)
- New real world driving emissions requirements for light passenger and commercial vehicles
- Additional funding to accelerate the uptake of low emissions buses and also for the retrofitting of older buses
- Additional funding to accelerate the uptake of hydrogen vehicles and associated infrastructure
- New mandatory emissions standards for non-road mobile machinery
- Local cycling and walking investment plans

[9] Department for Environment, Food and Rural Affairs, Department for Transport (2017), UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)

4.2.4 Gravesham Local Plan Core Strategy

The Council adopted the Local Plan in September 2014. Specific air quality related policy include:

SO17 Policy

Increase accessibility, reduce the need to travel, minimise congestion and

improve air quality through the improved provision of local public transport and the provision of local jobs and services.

4.2.5 Kent and Medway Air Quality Partnership Air Quality and Planning Technical Guidance

This technical guidance has been produced by the Kent and Medway Air Quality Partnership based on the London Council's guidance produced by APPLE (Air Pollution Planning and the Local Environment) working group.

Within the guidance a section on the Mitigation of Air Quality Impacts under the construction and demolition phases demonstrates the consideration of air quality under the planning and building phases of new developments.

4.3 Source Apportionment

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

A source apportionment exercise was carried out by Bureau Veritas on behalf of Gravesham Borough Council for the year 2022. This identified the percentage source contributions within the AQMAs. Full details are provided within the technical report in Appendix C including a breakdown of polluting vehicles and pollution from background sources.

The source apportionment exercise was undertaken using an air dispersion model to assess the overall emissions profile of vehicles moving through the AQMAs. It should be noted that emission sources of NO_2 are dominated by a combination of direct NO_2 (f-NO_2) and oxides of nitrogen (NO_x), the latter of which is chemically unstable and rapidly oxidised upon release to form NO_2. Reducing levels of NO_x emissions therefore reduces levels of NO_2.

The following sections describe the source apportionment results in each of the AQMAs. A breakdown of NO_x is given according to vehicle class within the AQMAs and based on the following criteria:

- Contributions based on average NO_x levels across all monitored locations;
- Contributions based on NO_x levels at the highest NO_2 concentration receptor in the AQMA.

4.3.1 Source Apportionment (A2 Trunk Road AQMA)

The source apportionment completed for the modelled receptors within the boundary of AQMA No.1 incorporates the 3 receptors as detailed within Table 4.1 below.

When considering the average NO_x concentration across all modelled receptors, road traffic accounts for 8.1 µg/m^3 (34.6%) of total NO_x concentration (23.5 µg/m^3). Of the 8.1 µg/m^3 total road NO_x, Diesel LGVs account for the greatest contribution (14.3%) of any of the vehicle types, followed by Diesel Cars (12.9%) and HGVs (4.8%). The remaining vehicle source groups (Petrol and Alternative Fuel Cars and LGVs, and Motorcycles) contribute less than 2.3% each.

The receptor with the maximum road NO_x concentration is receptor R9, located at The Inn on Lake Hotel off the A2 Trunk Road, whereby the total road NO_x was predicted to be 19.9 µg/m^3. At receptor R9 road traffic accounts for 58.5% of total NO_x concentration (34.0 µg/m^3). Of the 34.0 µg/m^3 total road NO_x the separate vehicle apportionment remains similar to the average source apportionment but with an increased apportionment to Petrol Cars (3.8%), Diesel Cars (21.2%), Petrol LGVs (0.1%), Diesel HGVs (24.2%) and Buses & Coaches (0.3%), with the remaining vehicle source group contributing less than 0.2%.

This indicates that measures to reduce emissions in this AQMA should largely be focused on reducing emissions from diesel cars and diesel LGVs.

Figure 4.2 shows the contribution of local NO_x background concentrations across the A2 in Gravesham. The ‘Industry’ source represents the emissions from combustion in industry, energy production, extraction of fossil fuel and waste. ‘Domestic’, institutional, and commercial space heating. ‘Other’ source represents emission from shipping, off-road and other emissions, ‘Point’ representing individual point sources and ‘Rural’ representing regional rural emissions. The remaining emissions are as stated in the

figure. The breakdown in background concentrations have been produced using NO_x local background concentrations derived from Defra background map for the grid squares covered by the modelled area.

Emissions from 'Rural' sources is the largest background contribution, representing 53.5% of the total background NO_x, this is followed by 'Other' sources contributing 18.4%. 'Domestic', 'Industry' and 'Point' sources represent less than 7.3% each, and 'Road' sources represents 11.2%.

Table 4.1 – NO_x Source Apportionment Results: AQMA No.1

Results	All Vehicles	Car			LGV			HGV	Bus and Coach	Motorcycle	Background
		Petrol	Diesel	EV/LPG	Petrol	Diesel	EV/LPG				
Average across all modelled receptors											
NO_x Concentration ($\mu g/m^3$)	8.1	0.5	3.0	0.0	<0.0	3.4	<0.0	1.1	0.0	<0.0	15.4
Percentage of Total NO_x	34.6%	2.3%	12.9%	0.0%	<0.0%	14.3%	<0.0%	4.8%	0.2%	0.1%	65.4%
Percentage Contribution to Road NO_x	100.0%	6.6%	37.3%	0.0%	0.1%	41.4%	0.0%	13.9%	0.5%	0.2%	-
At The Receptor With the Maximum Road NO_x Concentration (R9)											
NO_x Concentration ($\mu g/m^3$)	19.9	1.3	7.2	0.0	<0.0	8.3	0.0	3.0	0.1	<0.0	14.1
Percentage of Total NO_x	58.5%	3.8%	21.2%	0.0%	0.1%	24.2%	0.0%	8.8%	0.3%	0.1%	41.5%
Percentage Contribution to Road NO_x	100.0%	6.6%	36.2%	0.0%	0.2%	41.4%	0.0%	15.0%	0.5%	0.2%	-

Figure 4.1 – NO_x Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.1

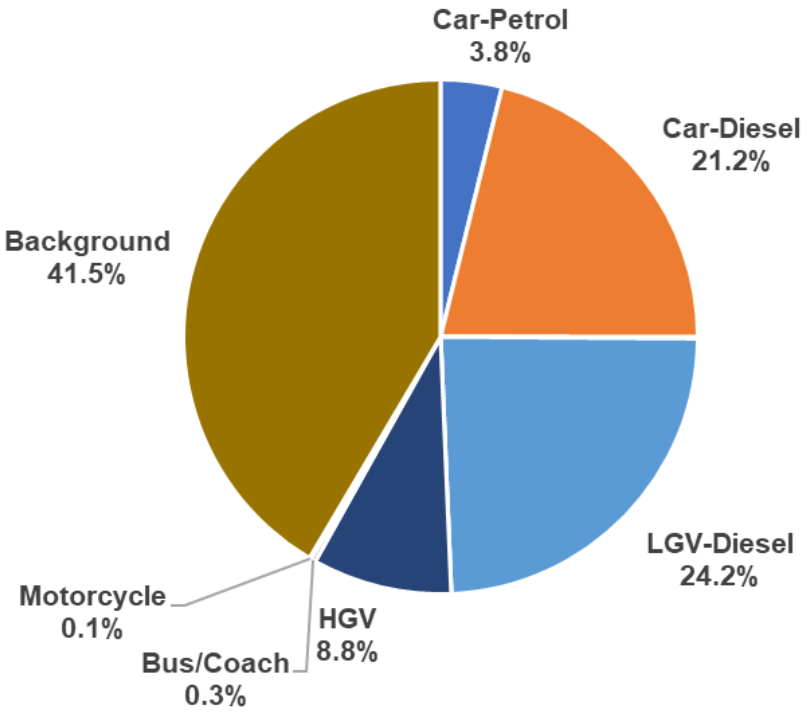


Figure 4.2 – Average Local Background NO_x Source Contributions Across All Modelled Receptors in AQMA No.1

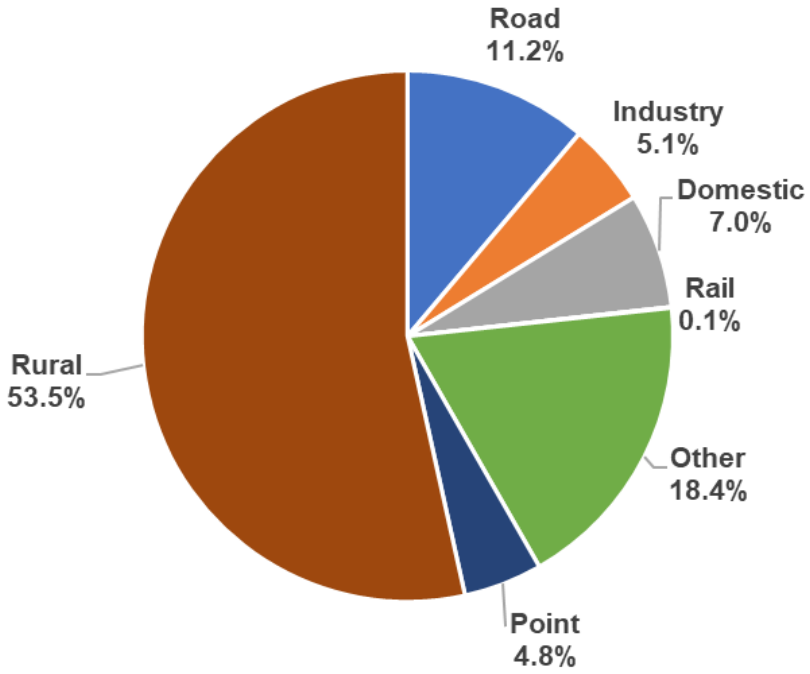
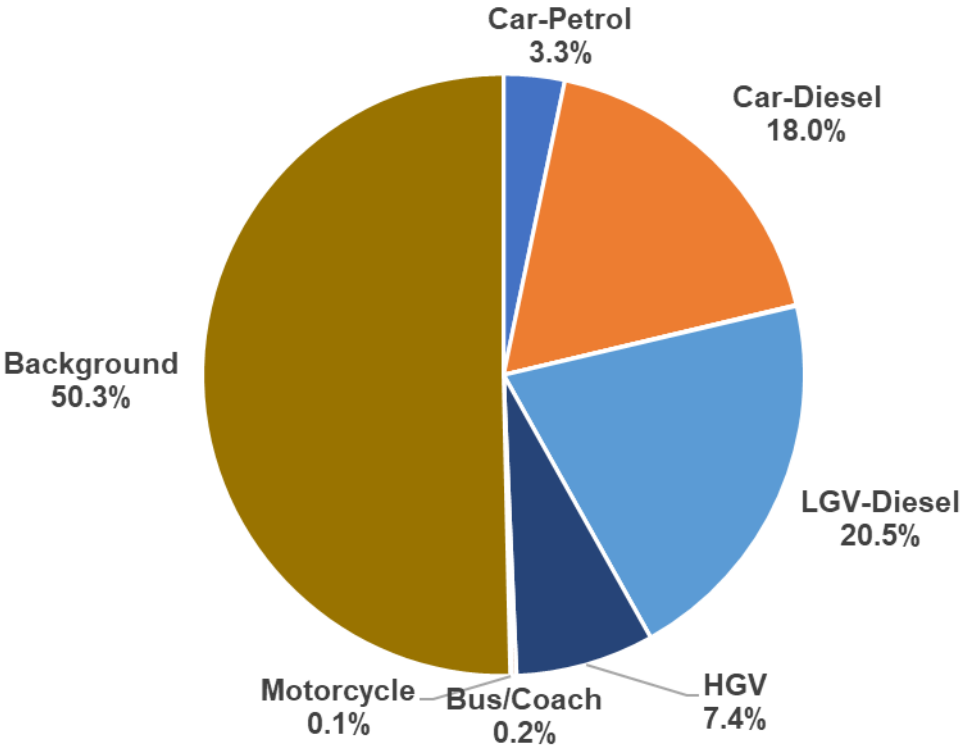


Figure 4.3 – NO_2 Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.1



4.3.2 Source Apportionment (Gravesham A226 One-way system AQMA)

The source apportionment completed for the modelled receptors within the boundary of AQMA No.3 incorporates the 27 receptors and maximum receptor point as detailed within Table 4.2 below.

When considering the average NO_x concentration across all modelled receptors, road traffic accounts for 15.1 µg/m^3 (29.9%) of total NO_x concentration (50.5 µg/m^3). Of the 15.1 µg/m3 total road NO_x, Diesel Cars account for the greatest contribution (12.1%) of any of the vehicle types, followed by Diesel LGVs (6.2%) and HGVs (5.2%) Buses & Coaches (4.5%). The remaining vehicle source groups (Petrol and Alternative Fuel Cars and LGVs, and Motorcycles) contribute less than 2.6% each.

The receptor with the maximum road NO_x concentration is receptor R24, located on Milton Road, whereby the total road NO_x was predicted to be 28.1 µg/m^3. At receptor R24 road traffic accounts for 42.3% of total NO_x concentration (66.5 µg/m^3). Of the 28.1 µg/m^3 total road NO_x the separate vehicle apportionment remains similar to average source apportionment but with a significant increased apportionment to Diesel Cars (16.1%), and a slight increased apportionment at Diesel LGVs (8.2%) and HGVs (6.3%), Petrol Cars, with the remaining vehicle source groups contributing less than 2.4% each. Bus & coaches apportionment increases by two times compared to the average with an apportionment of 9.3%.

This indicates that measures to reduce emissions in this AQMA should largely be focused on reducing emissions from diesel cars, diesel LGVs and buses & coaches.

Figure 4.5 shows the background contribution to local NO_x concentrations across Gravesham Town Centre AQMA No.3. Background NO_x contributes 70.1% to the total NO_x within AQMA No.3, the breakdown shows that emissions from ‘Other’ sources has the largest contribution of 51.3% of the total background NO_x, followed by ‘Rural’ sources contributing 27.0%. ‘Domestic’ emissions contribute 7.5%, and the remaining local background sources represent less than 3.0% of NO_x emissions. The local breakdown suggests, there is an increased influence from ‘Other’ emission source, whereby the nearby Gravesham Pier and the Thames being a main transport route for shipments to Tilbury Docks, ship emissions is likely to be contributing largely to background sources.

Table 4.2 – NO_x Source Apportionment Results: AQMA No.3

Results	All Vehicles	Car			LGV			HGV	Bus and Coach	Motorcycle	Background
		Petrol	Diesel	EV/LPG	Petrol	Diesel	EV/LPG				
Average across all modelled receptors											
NO_x Concentration ($\mu g/m^3$)	15.1	0.9	6.1	0.0	<0.0	3.1	0.0	2.6	2.3	<0.0	35.4
Percentage of Total NO_x	29.9%	1.8%	12.1%	0.0%	<0.0%	6.2%	0.0%	5.2%	4.5%	<0.0%	70.1%
Percentage Contribution to Road NO_x	100.0%	6.2%	40.5%	0.0%	0.1%	20.7%	0.0%	17.6%	14.9%	<0.0%	-
At The Receptor With the Maximum Road NO_x Concentration (R24)											
NO_2 Concentration ($\mu g/m^3$)	28.1	1.6	10.7	0.0	<0.0	5.5	0.0	4.2	6.2	<0.0	38.4
Percentage of Total NO_2	42.3%	2.4%	16.1%	0.0%	<0.0%	8.2%	0.0%	6.3%	9.3%	<0.0%	57.7%
Percentage Contribution to Road NO_2	100.0%	5.6%	38.0%	0.0%	0.1%	19.5%	0.0%	14.9%	22.0%	<0.0%	-

Figure 4.4 – NO_x Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.3

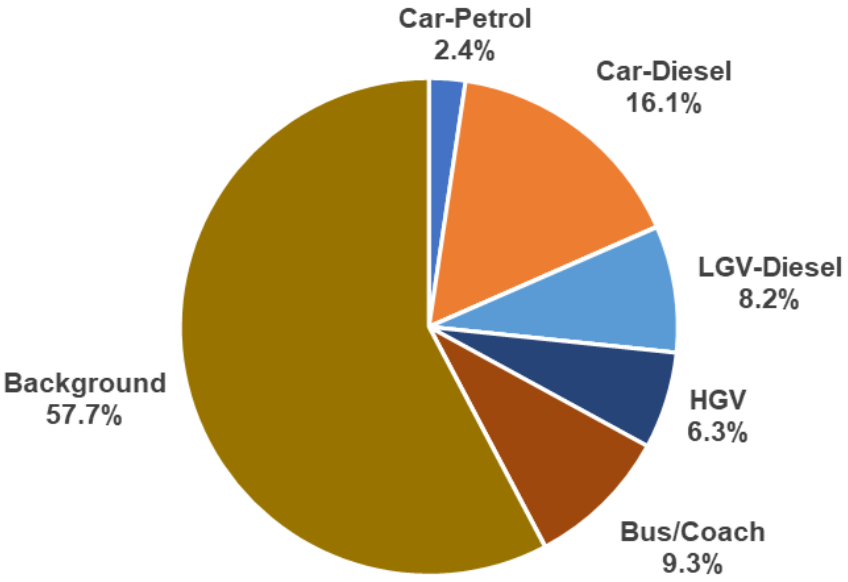


Figure 4.5 – Average Local Background NO_x Source Contributions Across All Modelled Receptors in AQMA No.3

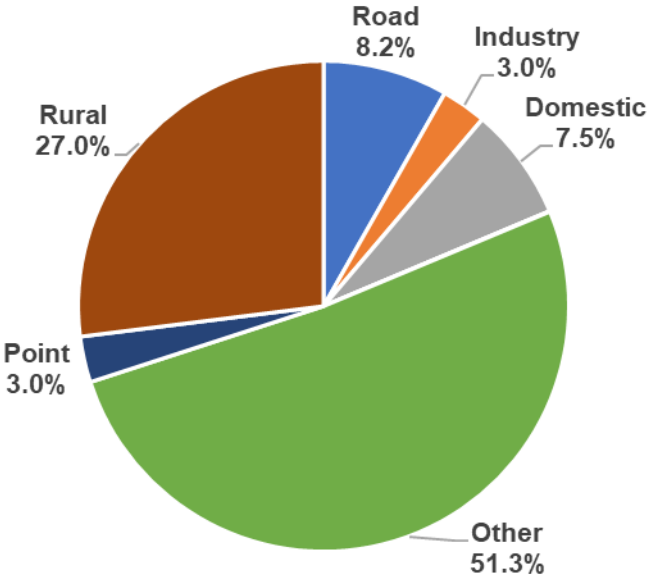
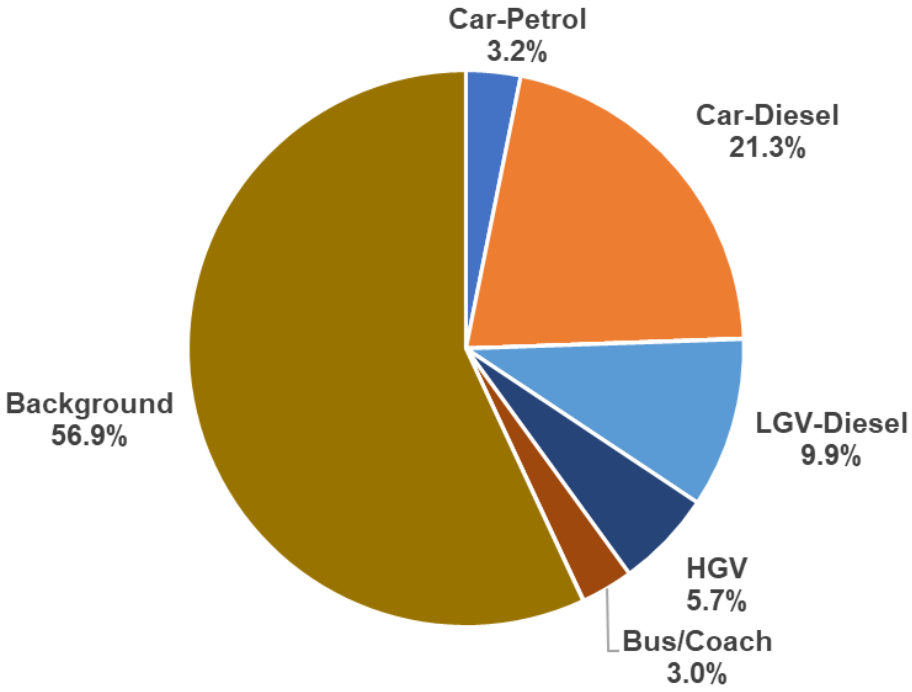


Figure 4.6 – NO_2 Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.3



4.3.3 Source Apportionment (Gravesham A227 Wrotham Road/ B261 Old Road West AQMA)

The source apportionment completed for the modelled receptors within the boundary of AQMA No.4 incorporates the 4 receptors and maximum receptor point as detailed within Table 4.3 below.

When considering the average NO_x concentration across all modelled receptors, road traffic accounts for 12.6 µg/m3 (32.1%) of total NO_x concentration (39.3 µg/m3). Of the 39.3 µg/m3 total road NO_x, Diesel Cars and HGVs account for the greatest contribution (16.4%) and (3.8%) of any of the vehicle types, followed by Diesel LGVs (8.7%). The remaining vehicle source groups (Petrol and Alternative Fuel Cars and LGVs, and Motorcycles) contribute less than 2.6% each.

The receptor with the maximum road NO_x concentration is receptor R34, the total road NO_x was predicted to be 16.5 µg/m^3. At receptor R34 road traffic accounts for 38.2% of total NO_x concentration (43.2 µg/m^3). Of the 43.2 µg/m^3 total road NO_x the separate vehicle apportionment remains similar to average source apportionment the previous average assessment but with a slight increase apportionment to Diesel Cars (19.6%) and LGVs (9.9%), and slight increase to the remaining vehicle source groups contributing less than 5.0%.

This indicates that measures to reduce emissions in this AQMA should largely be focused on reducing emissions from diesel cars and diesel LGVs.

Figure 4.8 shows the background contribution to local NO_x concentrations across AQMA No.4. Background NO_x contributes 67.9% to the total NO_x within AQMA No.4, the breakdown shows that emissions from ‘Rural’ sources has the largest contribution of 35.0% of the total background NO_x, followed by ‘Other’ sources contributing 33.0%. ‘Domestic’ emissions contribute 11.1%, and the remaining local background sources represent less than 3.5% of NO_x emissions.

Table 4.3 – NO_x Source Apportionment Results: AQMA No.4

Results	All Vehicles	Car			LGV			HGV	Bus and Coach	Motorcycle	Background
		Petrol	Diesel	EV/LPG	Petrol	Diesel	EV/LPG				
Average across all modelled receptors											
NO_x Concentration ($\mu g/m^3$)	12.6	1.0	6.4	0.0	<0.0	3.4	0.0	1.5	0.2	<0.0	26.7
Percentage of Total NO_x	32.1%	2.6%	16.4%	0.0%	0.0%	8.7%	0.0%	3.8%	0.6%	<0.0%	67.9%
Percentage Contribution to Road NO_x	100.0%	8.1%	51.0%	0.0%	0.1%	27.1%	0.0%	11.9%	1.7%	0.1%	-
At Receptor With Maximum Road NO_x Concentration (R34)											
NO_x Concentration ($\mu g/m^3$)	16.5	1.3	8.5	0.0	<0.0	4.3	0.0	2.1	0.3	<0.0	26.7
Percentage of Total NO_x	38.2%	3.0%	19.6%	0.0%	<0.0%	9.9%	0.0%	5.0%	0.6%	<0.0%	61.8%
Percentage Contribution to Road NO_x	100.0%	7.8%	51.3%	0.0%	0.1%	25.9%	0.0%	13.0%	1.7%	0.1%	-

Figure 4.7 – NO_x Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.4

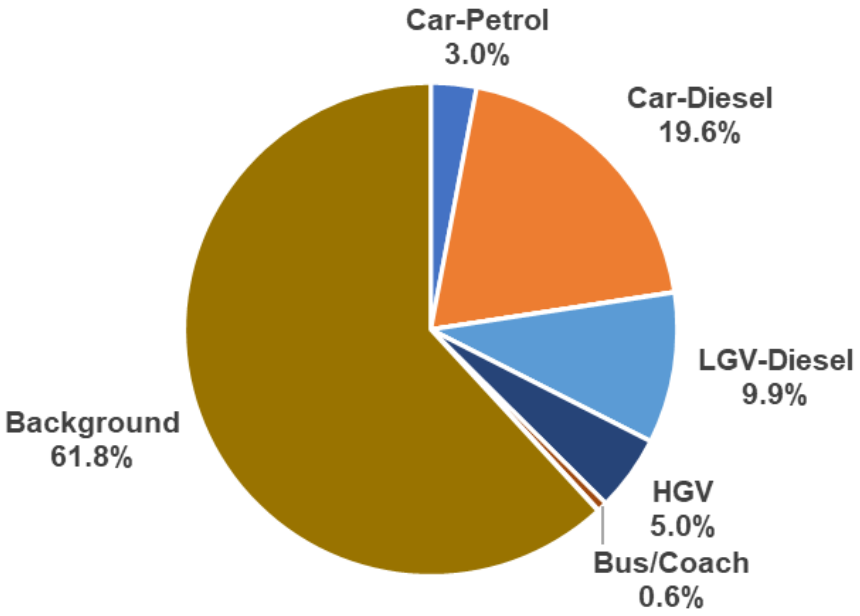


Figure 4.8 – Average Local Background NO_x Source Contributions Across All Modelled Receptors in AQMA No.4

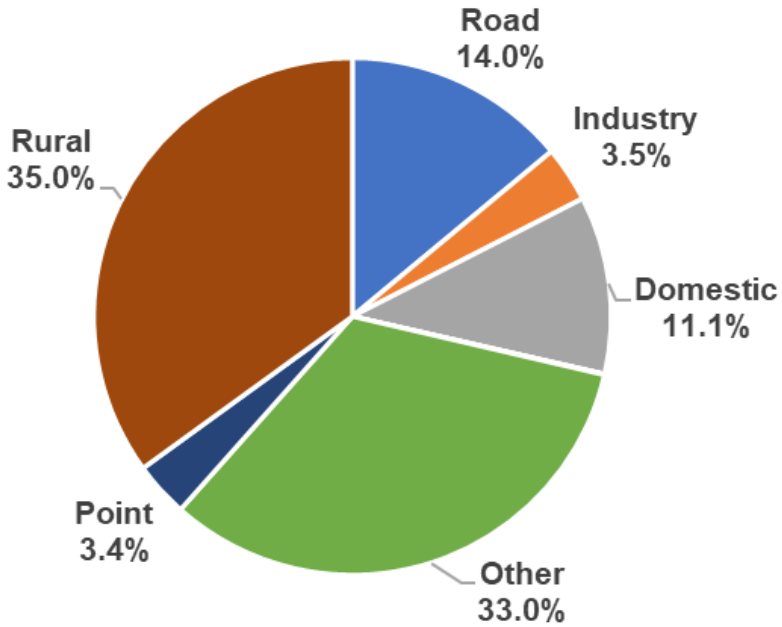
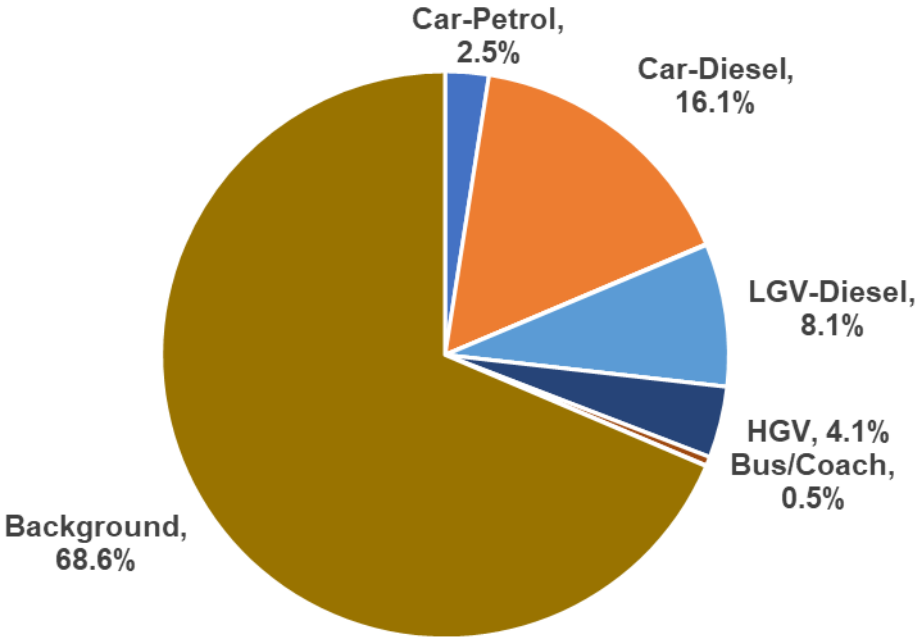


Figure 4.9 – NO_2 Source Apportionment percentage from Vehicles at Max Receptor in AQMA No.4



4.4 Required Reduction in Emissions

Within Gravesham, the 2022 diffusion tube monitoring and detailed modelling concentrations all reported concentrations below the AQS objective of 40 µg/m³. Therefore the calculation of required reduction in emissions has been calculated to 36 µg/m³ (10% lower than the annual mean AQS objective), which is full compliance for AQMA revocation.

In line with the methodology presented in Box 7.6 of LAQM.TG(22), calculations have been carried out to determine the necessary reduction in road NO_x required to bring AQMA No.1, No.3 and No.4. The reduction required at the worst-case location within each AQMA is presented, under the assumption that an equal reduction across the entirety of the AQMAs would ensure that all receptors are compliant.

4.4.1 AQMA No.1 (A2 Trunk Road

All modelled receptors within AQMA No.1 reported concentrations below 36 µg/m³, therefore the calculation for the reduction in NO_x emissions is not required. The maximum modelled concentration is located at R7 at the Inn on Lake hotel with a concentration of 32.2 µg/m³, this receptor is approximately 50m from the A2.

4.4.2 AQMA No. 3 (A226 One-way system)

The worst-case monitoring site within AQMA No.3 is located on Woodville Place in Gravesend Town Centre. The reduction in NO_2 required to achieve compliance with the annual mean NO_2 objective of 36 µg/m^3 at this location is 3.5 µg/m^3, this would equate to a required decrease in of 3% in NO_X emissions.

4.4.3 AQMA No.4 (A227 Wrotham Road/ B261 Old Road West AQMA)

All modelled receptors within AQMA No.4 reported concentrations below 36 µg/m³, therefore the calculation for the reduction in NO_x emissions is not required. The maximum modelled concentration is located at R34 located at a residential property on Wrotham Road with a concentration of 27.1 µg/m³.

4.5 Key Priorities

- **Priority 1 – Reduce the impact of traffic on air quality and congestion**

The main source of air pollution leading to the declaration of the AQMAs are road transport emissions. Therefore, reducing transport emissions are the key priority. Our approach focuses on areas where Gravesham Borough Council has direct control (e.g. planning and procurement of outsourced functions) and areas where measures can be implemented via a partnership with KCC, National Highways and/or others.

There are currently plans to reduce levels of NO_2 within the AQMAs through strategic highway improvements by introducing green corridors within Gravesham Borough. This also includes access management, anti-idling campaigns and bus priority (Fastrack). Gravesham are also focussing on reducing the emission standards of council fleets, buses and taxis by lowering personal mileage and increasing the percentage of electric vehicles in the fleet.

In addition, Gravesham are also taking several other efforts to improve uptake in cleaner vehicles. This includes increasing the number of electrical vehicle charging points.

- **Priority 2 – Sustainable Transport**

Gravesham currently have plans to make the borough's transport methods more sustainable, the Fastrack bus scheme is currently being developed to be fully electric by 2025. In addition, development for the Bath Street scheme is underway to construct a contraflow Fastrack bus lane on Bath Street and is part of the overall Fastrack programme across Dartford, Gravesham and Ebbsfleet.

The support of the development of a cycling and walking infrastructure to increase the use of sustainable transport modes such as walking and cycling is ongoing, with the expected completion of increased and improved walking and cycling routes.

- **Priority 3 – Public Health & Raising Awareness**

As detailed in Section 3.1, air pollution has a detrimental impact on public health. Therefore, improving air quality within the borough is a key priority. The main sources of air pollution in areas of public exposure in Gravesham Borough Council are from vehicle emissions. Aside from restricting vehicle usage through measures such as Clean Air Zones / Low Emission Zones, the most effective way to achieve a reduction

in vehicle numbers is to change the attitudes and behaviour of the population towards travel. Gravesham Borough Council will encourage and facilitate these changes through implementing a suite of interventions that have been informed by insights into the key factors affecting travel behaviour.

Measures will include education and awareness raising alongside schemes which incentivise change such as anti-idling campaigns and the adoption of travel plans in primary schools. Improving air quality to protect public health requires a wide-reaching perspective which is not specific to the AQMAs but instead aims to have a wider impact across the borough.

- **Priority 4 – Air Quality Monitoring**

Currently, the concentration of NO_2 is monitored by Gravesham Borough Council through a passive diffusion tube network consisting of 66 locations and now 1 automatic monitoring station since the decommissioning of the Industrial Background station in March 2024. Air quality monitoring is a useful way to continually assess the extent of air pollution and identify any area of concern within Gravesham. It also helps to measure the success of the measures implemented as part of this AQAP, and thus acts as an evidence base for the AQMA to be revoked once the monitoring shows compliance with the AQS objective for which the AQMA was declared for.

5 Development and Implementation of Gravesham Borough Council AQAP

5.1 Consultation and Stakeholder Engagement

In developing/updating this AQAP, we have worked with other local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995, as amended by the Environment Act (2021), requires local authorities to consult the bodies listed in Table 5.1. Consultation was undertaken throughout May and June 2024, following the incorporation of DEFRA's appraisal comments into the Draft AQAP.

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

Table 5.1 – Consultation Undertaken

Consultee	Consultation Undertaken
The Secretary of State	Yes
The Environment Agency	Yes
National Highways	Yes
All neighbouring local authorities	Yes
Any National Park authority as appropriate	Yes
The County Councils (if a District Council)	Highways Yes Public Health Yes
Other public authorities as appropriate, such as Public Health officials	Yes
Bodies representing local business interests and other organisations as appropriate	Yes

5.2 Steering Group

A steering group was established as part of the AQAP development process to drive forward the development of the new AQAP. The core aim of the steering group is to identify measures for inclusion within the AQAP that would be effective both in terms of reducing NO_2 concentrations and also feasible in terms of implementation and delivery.

The steering group is based on the membership of the Climate Change Officer Working Group membership and is composed of Gravesham Council officers from those Services with an interest or potential impact on air quality and who may have an influence on the action measures being considered.

The officers have provided and continue to provide guidance in their respective areas of expertise to ensure selection, and continual evaluation of the most appropriate measures. The steering group has met on a monthly basis since January 2022. The steering group includes officers from the local authority from: Environmental Protection, Climate Change, Planning, Licensing, Parking, Economic Development, Properties, Housing, Waste Management etc. With the upper tier Highways Authorities ie Kent County Council and National Highways being contacted separately.

The steering group sets out an ambitious approach to tackling Air Quality within the wider district. While the technical aspects of this AQAP have focussed on concentrations within the declared AQMA, the wider ambitions are included as part of the measures for reducing pollutant concentrations across the whole district.

It is the aim for the steering group to continue to communicate at regular intervals following the adoption of the AQAP. This is essential to provide progress reports on individual actions in relation to the AQAP measures, discuss any key lessons learnt from the continual implementation of the measures and to continue to discuss any new ideas in terms of future measures and actions within the borough.

Having members within the steering group from different areas and departments allows a collaborative approach to improving air quality and provides a wider scope of measures that can be implemented.

6 AQAP Measures

Table 6.1 shows the Gravesham Borough Council AQAP measures. It contains:

- a list of the actions that form part of the plan
- the departments/organisations responsible for delivering this action
- estimated cost of implementing each action
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

NB: Please see future Annual Status Reports (ASRs) for regular annual updates on implementation of these measures.

Additional information on some measures is set out below inclusive of how they relate to the source apportionment exercise, and measures National highways are undertaking and or are proposing.

National Highways will be working with key stakeholders to identify a package of potential improvements to roads within Gravesham. KCC Highways have a list of projects that are currently being undertaken or are proposed, which are also set out below.

6.1.1 Highway Improvements, Transport Infrastructure and Emission Standards

The source apportionment study has shown there is an issue with the volume of traffic from cars, especially diesel cars and diesel LGVs particularly in AQMA 3 (One Way System) and 4 (A227/B261 Wrotham Road), where higher contributions are observed.

Specific corridors within both AQMA No.3 and 4 have been upgraded as follows:

- A226 West Street near High Street – Being upgraded to current standards and made near-sided Puffin as part of normal signals renewal (started 08/01/24).
- A227 Wrotham Road / Old Road West – Signals were renewed, and pedestrian crossings made near-sided Puffins

National Highways and KCC Partnership

Supporting National Highways in the identification and delivery of actions to improve air quality along the network managed by National Highways in the borough of Gravesham i.e. the corridor of the A2 Trunk Road and in the design, construction and operation of the new Lower Thames Crossing. For example:

- traffic management
- managing speeds to reduce emissions
- working to accelerate the uptake of zero emission vans
- air quality barriers

Support and assist KCC in delivering schemes in the Borough that will reduce congestion, improve public transport and facilities for cycling etc. For example:

- Thames Way Scheme to upgrade the Thames Way / Springhead Road junction from a roundabout to a signalised junction to reduce congestion at the junction, improve Fastrack connections and install a cycleway from Thames Way to Springhead Parkway.
- UTMC – Urban Traffic Management – the upgrading of 42 junctions across Kent Thameside to smart signals (MOVA/SCOOT) to increase capacity and throughput for all of the junctions, including Lord Street / Windmill Street, Lord Street / Parrock Street crossings, and the renewal of the bust at The Overcliffe by Stuart Road.
- Wrotham Road / Old Road West – signal renewal
- Bath Street Major Projects linked to the bus hub works. This scheme proposes to construct a contraflow Fastrack bus lane on Bath Street and will link the Northfleet Embankment East development to the town centre

Improve emissions standards for Council Fleet

- Review and replace the vehicles in the council's fleet with the highest emissions on a continuous basis with higher EURO standard vehicles
- Investigate alternative fuels suitable to power the council's fleet

- Frequently service and maintain the council's fleet in good working order to ensure emissions are kept to a minimum
- Enrol all drivers of fleet vehicles on training to drive more efficiently to reduce the amount of fuel being used and therefore reduce the emissions from the engine and brakes etc.

Improve emissions standards for Buses

- Raise the awareness of drivers of buses and coaches of the effects idling of engines.
- Investigate the uptake of the Quality Bus Partnership by operators in the Borough
- Encourage the use of cleaner higher Euro standard or alternative fuel buses and coaches by the operators
- Encourage bus users to favour operators with cleaner bus technology
- Encourage the use of public transport to remove a large number of cars from the road
- Support the expansion of bus prioritisation in the Borough
- Support KCC in their transition to 100% electric Fastrack buses by Spring 2025

Improve emissions standards for Taxis

- Continue to expand the use of taxi and private hire vehicle (PHV) licensing to improve the taxi fleet.
- Retain the requirement that all vehicles presented for first time licensing must meet Euro 5 or Euro 6 emission standards
- Encourage drivers to license vehicles that are of an electric, hybrid or other low emission type
- Encourage drivers of taxis and PHVs to better maintain the vehicles to reduce emissions from them such as by way of frequent MOT Tests and inspections
- Raise the awareness of drivers of taxis, and PHVs, of the effects of the idling of engines specially in taxi ranks
- Work in partnership with other bodies e.g. Energy Savings Trust to educate taxi and PHV drivers on how to drive more efficiently
- Review the minimum Euro standards when Taxi Licensing Policy is reviewed every 5 years.

The Strategic Transport Infrastructure Programme (STIPs)

STIPs and the Urban Traffic Management and Control (UTMC) scheme has upgraded 42 junctions across Dartford, Ebbsfleet and Gravesham to smart signals (MOVA/SCOOT) and as such increased capacity and throughput for all of the junctions. The aim of the project was to reduce journey times and congestion across the two towns, and principally on the Fastrack routes.

Scheme to upgrade the Thames Way/Springhead Road junction from a roundabout to a signalised junction, to reduce congestion and improve Fastrack connections. The scheme is also likely to include a cycleway from Thames Way to Springhead Parkway (to join Green Corridors 3 - Site 8).

Mobility as a Service (MaaS) – KCC is establishing a multi-modal MaaS Framework that ensures transport is truly integrated at an app & operational level, to provide seamless travel options for residents of Ebbsfleet area, and Kent & Medway over time.

MaaS will allow residents of Ebbsfleet, Dartford & Gravesend the opportunity to live without the need to own a private car, providing access to a wide range of shared electric transport & active travel modes – digital infrastructure & enhancing physical infrastructure. MaaS is a Step change in modal shift away from car ownership & SOV to shared zero emission public transport & active travel and should:

- Reduce car usage & car dependency in Kent
- Reduce CO_2 emissions & improve air quality
- Improve public health & wellbeing by reducing air pollution & encouraging active travel
- Help prevent gridlock in Ebbsfleet & surrounding urban area
- Improve travel options for residents & introduce new travel modes
- Improved social outcomes by improved accessibility
- Create a truly integrated transport system using innovative technology & collaborative partnership working.

Electric Vehicles (EVs) – KCC are looking to install new EV chargers at Gravesend Cyclopark in 2024 to enable those travelling into and out of Gravesham to re charge their EV's more easily. In 2024 KCC will procure for the Local Electric Vehicle Infrastructure (LEVI) project seeking to install up to 10,000 sockets across the county by 2035. This project will affect many parts of Gravesham and the project is designed to provide chargers for those without off street parking. Installs will begin in 2025. The project will:

- Improve public health & wellbeing by reducing air pollution & encouraging active travel
- Help prevent gridlock in Ebbsfleet & surrounding urban area
- Improve travel options for residents & introduce new travel modes
- Improved social outcomes by improved accessibility
- Create a truly integrated transport system using innovative technology & collaborative partnership working.

Green Corridors – The Green Corridors programme of works aims to improve pedestrian and cycling routes within the boroughs of Gravesham and Dartford. As the programme is linked to walking and cycling a key target is to reduce trip numbers taken

in cars. This could provide a link to AQMA's due to the reduction in emissions through fewer journeys made by car. Two sites to be improved are; a shared use cycle / footway improvement along Northfleet High Street between College Road and Vicarage Drive, and a pedestrian improvement on the footpath between the Black Eagle Drive housing estate to Ebbsfleet International Station.

As part of the Green Corridors programme KCC Highways are also working on other schemes in the urban area of Gravesham but not wholly within the AQMA's. These sites include the segregated cycle facilities on Springhead Road and Hall Road. It is a target to improve and increase trips taken in these areas through cycling. This again will help to reduce the number of journeys taken by car and reduce emissions leading to improved air quality for the surrounding residential areas.

Anti-Idling campaign – This scheme will aim to reduce the emissions from idling cars with the support of schools and increased signage.

- Installation of anti-idling signage around sensitive receptors e.g. schools and other public spaces e.g. council car parks
- Expand anti idling messaging on social media
- Explore further the interest from local schools on anti-idling campaigns around school gates

Lower Thames Crossing Designated Funds - Between 2020 to 2025, National Highways are providing £936 million across four funding streams focused on making improvements to the network and adjacent. These are: Safety and Congestion, Environment and wellbeing, Users and communities, and Innovation and modernisation. £30m of the fund was ringfenced for projects associated with the Lower Thames Crossing Development Consent Order, with all schemes put forward needing to be complete by 31.03.2025. Through this fund, KCC have secured funding for a number of schemes including MaaS, Ebike / cycle hire, DRT, Fastrack expansion study, cycle crossings. https://nationalhighways.co.uk/our-work/designated-funds/

6.1.2 Public Transport Infrastructure Improvements

Improve sustainable transport links serving new developments

- Support expansion of Fastrack public transport scheme to new developments
- Seek increased coverage and provision of public transport leading to increased usage and a reduction in private lone journeys
- Land use planning has a key role in delivering sustainable transport systems within the area by influencing the location, scale, density, design and mix of development and encouraging alternative modes of travel.

Fastrack – Bath Street Scheme – This scheme proposes to construct a contraflow Fastrack bus lane on Bath Street and is part of the overall Fastrack programme across Dartford, Gravesham and Ebbsfleet. It will implement a key Fastrack link between the Northfleet Embankment East development and Gravesend town centre. Continual improvements to the network are required to achieve high quality, rapid, sustainable transport. The scheme will improve Fastrack users journey times, and also enable additional bus stops to service existing residents and those from new developments such as Clifton Slipways, The Charter and Northfleet Embankment. These improvements to journey time and route will make Fastrack more accessible to Gravesend residents and further encourage uptake. https://www.kent.gov.uk/roads-and-travel/road-projects/in-progress-road-projects/bath-street-fastrack-bus lane#:~:text=The%20Bath%20Street%20scheme%20will,developments%20including%20Northfleet%20Embankment%20East.

- **Electric Buses** – The Fastrack bus fleet will be fully electric by Spring 2025

KCC LCWIP - The KCC draft LCWIP (Let's Talk Cycling and Walking Infrastructure Plan) takes a strategic approach to improving walking and cycling infrastructure and has been developed to ensure that the public and stakeholders are clear about where our priorities are for improvements to walking, wheeling and cycling and to help us make sure that each district LCWIP forms a coherent county wide plan for delivery. https://letstalk.kent.gov.uk/kent-cycling-and-walking-infrastructure-plan. The consultation on the LCWIP closed on 10th January 2024.

6.1.3 Local Plan / Travel Plans

Working with schools to promote active transport and adoption of Travel Plans

- Support the KCC School Travel Plan officer in the promotion and enablement of active and sustainable transport
- EDC have funded the BetterPoints active travel app which is available to Gravesham residents. Details of this free app could be promoted by Gravesham BC.
- Encourage schools to engage with the School Travel Plan process and to make use of the resources KCC provides e.g.
    - School travel plan templates and advice
    - Grant funding opportunities for projects to enable more sustainable travel methods (e.g. installing EV charging points, active travel infrastructure)
    - Responsible Parking toolkit including weatherproof banners, leaflets and flyers that help support the message to parents about safe parking and turning off the engine etc.
    - Active Travel maps
    - School Street Scheme

Draft LTP5 – In line with the Local Transport Act 2000 (as amended in 2008), KCC has a Local Transport Plan (LTP4) containing policies for the promotion and encouragement of safe, integrated, efficient and economic transport to, from and within the County. KCC are considering how Kent's transport network will need to change long into the future based on our understanding of how Kent's population may grow up to around 2040 as well national targets to reduce carbon dioxide emissions from transport by 2050 and have started updating our current LTP, and have recently consulted on the first draft of LTP5. The Local Transport Plan concerns county-wide transport challenges and proposals, and new transport infrastructure investment across different places in the county. The proposals KCC make in the Plan may be planned to enable new services or improved services to occur in the future if the funding KCC need to deliver new infrastructure to enable that can be found. https://letstalk.kent.gov.uk/local-transport-plan-5/widgets/71157/faqs#18939.

Kent Energy and Low Emissions Strategy - The Kent and Medway Energy and Low Emissions Strategy sets out how KCC, in partnership with Medway Council and the Kent district councils, will respond to the UK climate emergency and drive clean, resilient economic recovery across the county. We'll be focused on transport, biodiversity, housing, and supporting local business. The consultation on the draft LCWIP closed on 10 January 2024. https://www.kent.gov.uk/about-the-council/strategies-and-policies/service-specific-policies/environment-and-waste-policies/environmental-policies/kent-and-medway-energy-and-low-emissions-strategy

Plan Tree – Kent Plan Tree was adopted in October 2022. This tree establishment strategy sets an ambition for Kent to extend tree cover by 1.5 million new trees and increase the county's average canopy cover to 19%. Furthermore, the existing woodland and trees' health will be restored and afforded greater protection from loss. Tree establishment in the county will be underpinned by four principles: Better management and protection of existing stock, The right tree in the right place for the right reason with the right management and right monitoring, Deliver multiple benefit, and Ensure biosecurity of new tree stock through the application of strict standards. https://www.kent.gov.uk/environment-waste-and-planning/nature-and-biodiversity/trees/tree-planting-statement

Vision Zero – Kent County Council (KCC) is setting the target of zero, or as close as possible, fatalities and life changing injuries by 2050 with a 50% reduction by 2030 and a target of no more than 39 traffic fatalities by 2026. Vision Zero is not just about focussing on the date zero is achieved , but the recognition that deaths on the road are not an acceptable price to pay for mobility. KCC will follow the Safe System Approach which understands that people make mistakes and aims to ensure these mistakes do not cause a death or a life-changing injury. The Safe System Approach consists of:

- safe roads and streets
- safe speed
- safe behaviour
- safe vehicles
- post collision response.

https://www.kent.gov.uk/roads-and-travel/road-safety/road-casualty-reduction-strategy

Bikeability Training – Bikeability is the Department for Transport's flagship national cycle training programme for schoolchildren in England, and is a key component of Gear Change. Within the south east region training is delivered by KCC and a training provider, training is provided to a majority of Dartford & Gravesham Primary Schools and some secondary schools. Adult and family cycle training is offered at Cyclopark, Gravesend by KCC instructors.

The Ebbsfleet Implementation Framework, the Ebbsfleet Public Realm Strategy and the Ebbsfleet Sustainable Travel Strategy are strategies that have positive implications for improving air quality through supporting active and sustainable travel.

Table 6.1 – Air Quality Action Plan Measures

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Improve emissions standards for Council Fleet	Vehicle Fleet Efficiency	Fleet Efficiency and recognition schemes	2006	On-going	Gravesham Borough	GBC / Grants where available	NO	TBC	£50k - £100k	Implementation	<0.5µg/m^3	Reduction in mileage Later Euro standard vehicles Increase in percentage of electric vehicles in the fleet.	-	-
2	Improve emissions standards for Buses	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2024	On-going	Kent County Council / Transport Operators / Developers	KCC / Transport operators / Developers	NO	TBC	£50k - £100k	Implementation	<0.5µg/m^3	Increase in percentage of electric vehicles in the fleet.	-	-
3	Improve emissions standards for Taxis	Promoting Low Emission Transport	Taxi Licensing conditions	2024	On-going	Gravesham Borough	GBC / Taxi owners	NO	TBC	£50k - £100k	Implementation	<0.5µg/m^3	Later Euro standard vehicles increase in percentage of electric vehicles in fleet. Retain the requirement that all vehicles presented for first time licensing must meet Euro 5 or Euro 6 emission standards for: All vehicles, other than stretched limousines and Wheelchair Accessible Vehicles, must meet or exceed the Euro 5 or 6 emission standards. From 1 April 2025, all vehicle licence applications for newly licenced vehicles (i.e. all applications other than those to 'renew' an existing vehicle licence for the same vehicle	-	-

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
													by the same holder) must be for vehicles that are powered wholly by electricity. From 1 April 2030, all vehicle licence applications must be for vehicles that are powered wholly by electricity. Encourage drivers to licence vehicles that are of an electric, hybrid or other low emission type • Encourage drivers of taxis and PHVs to better maintain the vehicles to reduce emissions from them such as by way of frequent MOT Tests and inspections an Annual MOT Test, interim 6-month safety and standards inspection and ad hoc inspections when required. • Raise the awareness of drivers of taxis and PHVs, of the effects of the idling of engines especially in on taxi ranks • Work in partnership with other bodies e.g. Energy Savings Trust to educate taxi and PHV drivers on how to drive more efficiently		

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
													• Review the minimum Euro standards when Taxi Licensing Policy is reviewed every 5 years Continue to expand the use of taxi and private hire vehicle (PHV) licensing to improve the taxi fleet - The vehicle specifications for taxi and PHVs are contained within the Hackney Carriage and Private Hire Policy and particular consideration is given to limiting the age of vehicles, inspection & MOT requirements and vehicle emissions.		
4	Working with schools to promote active transport	Promoting Travel Alternatives	Promoting Travel Alternatives	2004	On-going	KCC / Gravesham Borough Council	GBC / S106 funding / KCC / Developers	NO	Funded	< £10k	Implementation	<0.5µg/m^3	All primary schools in Gravesham have reviewed their Travel Plan. All primary schools in Gravesham have signed up to Pollution Patrol.	-	-
5	Support the development of cycling and walking infrastructure to increase the use of sustainable transport modes such as walking and cycling	Transport Planning and Infrastructure	Cycle network and other	2004	On-going	KCC / Gravesham Borough Council	GBC / KCC / Developers / Grant funding where available	NO	TBC	< £10k	Implementation	<0.5µg/m^3	Completion of improved walking and cycling routes.	-	-
6	Community Protection will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2004	On-going	Gravesham Borough Council	GBC / Developers	NO	Funded	< £10k	Implementation	<0.5µg/m^3	Number of planning applications consulted on.	-	-

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	account in the planning process														
7	Improve sustainable transport links serving new developments	Transport Planning and Infrastructure	Bus route improvements	2004	On-going	KCC / Gravesham Borough Council	GBC / KCCC / Developers / Grant funding where available	NO	TBC	< £10k	Implementation	<0.5µg/m^3	Increase in the routes of Fastrack.	-	-
8	Local air quality monitoring within the GBC Borough	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2004	On-going	Gravesham Borough Council / Kent and Medway Air Quality Partnership	GBC / S106 funding / Developers	NO	Funded	< £10k	Implementation	<0.5µg/m^3	Capture Rate of monitoring data.	-	-
9	Make details of the Action Plan measures and annual progress reports GBC available on the www.KentAir.org.uk website to ensure broad access to the consultation and implementation process.	Public Information	Via the Internet	2004	On-going	Gravesham Borough Council	GBC	NO	Funded	< £10k	Implementation	<0.5µg/m^3	Continued access to reports and data on www.KentAir.org.uk	-	-
10	Promote and implement energy efficiency measures	Policy Guidance and Development Control	Other policy	2004	On-going	Gravesham Borough Council	GBC / Developers / Grant funding where available / Other bodies eg Energy Savings Trust	NO	TBC	£50K - £100K	Implementation	<0.5µg/m^3	Continued promotion and implementation of energy efficiency measures.	-	-
11	The council will encourage the planting of trees which benefit air quality within the borough through the planning process	Policy Guidance and Development Control	Other policy	2004	On-going	Kent County Council/ Graves ham Borough Council	GBC / Developers	NO	Funded	< £10k	Implementation	<0.5µg/m^3	Number of trees planted in borough.	-	-

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	as well as carry out tree planting programmes on Gravesham owned land														
12	Provide advice to the public and pursue an advocacy role to assist in minimising the effects of poor air quality in buildings.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2004	On-going	Kent County Council/ Gravesham Borough Council	GBC / S106 funding / Developers	NO	TBC	< £10k	Implementation	<0.5µg/m^3	Continued provision of advice.	-	-
13	Adequate enforcement of on-street parking restrictions	Traffic Management	UTC, Congestion management, traffic reduction	2006	On-going	Kent County Council/ Graves ham Borough Council	GBC	NO	Funded	< £10k	Implementation	<0.5µg/m^3	Number of on street parking penalty notices.	-	-
14	Anti-Idling Campaign	Public Information	Via other mechanisms	2024	On-going	GBC	GBC / S106 Funding / KCC / Schools	NO	TBC	< £10k	Planning	<0.5µg/m^3	Number of schools included in the campaign / Signage posted.	-	-
15	Increase the number of Electric Vehicle charging points in the Borough	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging	2004	On-going	GBC / developers	GBC / Developers / Grant funding where available	NO	TBC	£50K - £100K	Implementation	2.3µg/m^3	Number of EV charging points in public areas and in developments.	-	-
16	To review the Council's own Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	2004	2025	GBC	GBC	NO	TBC	< £10k	Planning	<0.5µg/m^3	Travel plan reviewed.	-	-
17	Work with relevant teams at National Highways to identify actions that can be delivered jointly to improve local air quality or enhance other actions in this plan.	Traffic Management	Strategic Highway Improvements	2024	12 months	National Highways / GBC	Developers / National Highways	NO	TBC	£100k - £500k	Planning	<0.5µg/m^3	Delivery of individual scheme. AQ mitigation in the design for Lower Thames Crossing.	-	-
18	Work with relevant teams at Kent County Highways to identify actions that can be delivered to improve local air quality or enhance	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access	2006	Ongoing - various schemes	KCC Highways / GBC	Developers / KCC Highways	NO	TBC	£100k - £500k	Planning	0.5 – 1µg/m^3	Individual schemes delivered.	-	-

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	other actions in this plan.		management, Selective vehicle priority, bus priority, high vehicle occupancy lane												
19	Carry out campaigns to raise awareness of the impact of the burning of waste and the emissions of smoke from chimneys in conjunction with establishing robust procedures to deal with smoke nuisance. impact of the burning of waste and the emissions of smoke from chimneys in conjunction with establishing robust procedures to deal with smoke nuisance.	Other	Other policy	2024	2024	GBC	GBC / Defra Grant	NO	Funded	< £10k	Planning	<0.5µg/m^3	Review of current area covered by SCA designations reviewed. If appropriate declaration of new SCA covering areas omitted currently eg in Northfleet. Drafting and implementation of a new smoke control enforcement procedure.	-	-

6.2 Timescales of the AQAP Measures

Many of the measures set out in Table 6.1 are at the Planning stage. These measures are in their infancy and, while there is every ambition to implement these to achieve reductions in pollutant concentrations within Gravesham, they will require investigation and planning before a realistic timescale can be set.

6.3 Air Quality Partners

National Highways are responsible for the traffic within the A2 Trunk Road AQMA. They have been engaged with and we continue to work closely with them as part of the steering group and wider Air Quality objectives across the borough.

6.4 Future Measures to Maintain Safe Air Quality

It is recognised that improving air quality is an ongoing challenge which must be weighed against business interests and political will. There are a number of measures within this AQAP which look to make behavioural changes by improving active travel. With these measures, we look to make sustainable, long-term changes in patterns of behaviour which will aid in reducing pollution in years and decades to come.

Gravesham Borough Council will develop a new air quality strategy once all 3 AQMAs have been revoked to maintain good air quality

7 Quantification of Measures

Many of the measures set out in Table 7.1 are difficult to quantify. No detailed studies have been completed for any measure to reliably inform the likely effect in terms of change in traffic or fleet composition as a result of the measures. Some measures do allow for a high-level analysis of reductions in emissions. A summary consideration of the measures and whether they can be quantified is contained in Table 7.1 below.

Table 7.1 – Assumptions around Quantification of Measures

Measure no.	Measure	Assumptions for Quantification	Quantifiable?	Assumed Reduction in AQMA
1	Improve emissions standards for Council Fleet.	As change in fleet/trips not yet known as measure not possible to quantify measures	N	<0.5µg/m^3
2	Improve emissions standards for Buses.	As change in fleet/trips not yet known, measure not possible to quantify reduction	N	<0.5µg/m^3
3	Improve emissions standards for Taxis.	As change in fleet/trips not yet known, measure not possible to quantify reduction	N	<0.5µg/m^3
4	Working with schools to promote active transport and adoption of Travel Plans.	Unknown effectiveness at this stage. Reduction based on professional judgement	N	<0.5µg/m^3
5	Support the development of cycling and walking infrastructure to increase the use of sustainable transport modes such as walking and cycling.	It is not possible to quantify any measure from this document at this stage	N	<0.5µg/m^3
6	Community Protection will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process.	It is not possible to quantify any measure from this document at this stage	N	<0.5µg/m^3
7	Improve sustainable transport links serving new developments.	It is not possible to quantify any measure from this document at this stage	N	<0.5µg/m^3
8	Local air quality monitoring within the GBC Borough.	No quantification of reduction in emissions due to solely monitoring NO_2.	N	-
9	Make details of the Action Plan measures and annual progress reports GBC available on the www.KentAir.org.uk website to ensure broad access to the consultation and implementation process.	-	N	-
10	Promote and implement energy efficiency measures.	Unknown effectiveness at this stage. Reduction based on professional judgement	N	<0.5µg/m^3
11	The council will encourage the planting of trees which benefit air quality within the borough through the planning process as well as carry out tree planting programmes on Gravesham owned land.	Unknown effectiveness at this stage. Reduction based on professional judgement	N	<0.5µg/m^3

Measure no.	Measure	Assumptions for Quantification	Quantifiable?	Assumed Reduction in AQMA
12	Provide advice to the public and pursue an advocacy role to assist in minimising the effects of poor air quality in buildings.	Unknown effectiveness at this stage. Reduction based on professional judgement	N	<0.5µg/m^3
13	Adequate enforcement of on-street parking restrictions.	Unknown effectiveness at this stage. Reduction based on professional judgement.	N	<0.5µg/m^3
14	Anti-Idling Campaign.	This is likely to reduce emissions across the AQMA but is not quantifiable.	N	0.5 – 1 µg/m^3
15	Increase the number of Electric Vehicle charging points in the Borough.	Encourages enhanced uptake of Electric Vehicles. Expected 0.006% reduction in road emissions of NO_x per EV rather than combustion engine vehicle using latest Emissions Factors Toolkit. It is assumed there will be an uptake of 5% from Diesel/Petrol to EV meaning an average of 1369 AADT change across the borough. The model was run with a reduction of 5% across all road link emissions resulting in an average NO_2 reduction of 2.3ug/m^3 across the 3 AQMAs. Effectiveness of measure in isolation is likely to be negligible, but it will help to push the drive towards normalising EV use.	Y	2.3µg/m³
16	To review the Council's own Travel Plan.	This is likely to reduce emissions across the AQMA but depending on scale and individual plans it is not possible to quantify.	N	<0.5µg/m^3
17	Work with relevant teams at National Highways to identify actions that can be delivered jointly to improve local air quality or enhance other actions in this plan.	Through potential highway improvements it is assumed that there may be an increase in average speed across the AQMA as congestion is reduced. The model was run with an assumed increase of speeds of 5kph across all road links within the A226 One Way System and A227 Wrotham Road AQMAs. This resulted in a reduced average concentration in NO_2 of 0.5ug/m^3. It is likely that the reduction will not be this high due to there still being queuing of traffic at slowdown junction however it does show how the effectiveness of easing congestion throughout the AQMA.	N	0.5µg/m^3

Measure no.	Measure	Assumptions for Quantification	Quantifiable?	Assumed Reduction in AQMA
		It is unlikely to see a 5kph increase across all road links due to the variability in changes in specific road speeds and consistency.		
18	Work with relevant teams at Kent County Highways to identify actions that can be delivered to improve local air quality or enhance other actions in this plan.	It is not possible to quantify any measure from this document at this stage	N	0.5 – 1µg/m^3
19	Carry out campaigns to raise awareness of the impact of the burning of waste and the emissions of smoke from chimneys in conjunction with establishing robust procedures to deal with smoke nuisance.	It is not possible to quantify any measure from this document at this stage	N	<0.5µg/m^3

7.1.1 Measure Quantification – Increased Electric Vehicle Charging Points in the Borough

There is an expected 0.006% reduction in road emissions of NO_x per EV rather than combustion engine vehicle using latest Emissions Factors Toolkit. It has been assumed that there will be an uptake of EVs from combustion vehicles of 5% within the borough resulting in an average change of 1369 (5%) AADT across the AQMA.

The model was run with a reduction of 5% across all road link emissions resulting in an average NO_2 decrease of 2.3 µg/m³.

While the effectiveness of the measure in isolation results in a negligible reduction in NO_2 concentrations within the AQMA it indicates a positive change towards normalising EV usage in the borough.

7.1.2 Measure Quantification – National Highway Improvements

It has been assumed that this measure may result in the average speed within the AQMAs No.1 and No.4 increasing due to reduced congestion and queuing. The Emissions Factors Toolkit (EFT) latest version was updated with an increase of 5kph across all road links used in the detailed modelling assessment. Detailed modelling was then conducted with the updated emissions rates to see the impact of reducing congestion and thus increasing the average speed within the junction.

The modelling presented an average reduction in NO_2 of 0.5µg/m³ across all modelled receptors within both AQMAs No.1 and No.4. It is likely that the reduction will not be this high due to there still being queuing of traffic at junctions, however it does show the potential change that may result from this measure and thus the effectiveness of easing congestion throughout the AQMA.

7.2 Cost Benefit Analysis of Measures

7.2.1 Methodology

Using the above assumptions around the quantitative pollution reduction and assumed costs, each measure was given a score as set out below.

Table 7.2 – Cost Score

Estimated Cost of Measure	Score
10k	1
£10k - £50k	2
£50k - £100k	3
£100k - £500k	4
£500k - £1m	5
£1m - £10m	6
> £10m	7

Table 7.3 – Benefit Score

Estimated Reduction in Pollutant Concentrations	Score
>0.5µg/m³	1
0.5-1 µg/m³	2
1-2 µg/m³	3
2-3 µg/m³	4
3-4 µg/m³	5
4-5 µg/m³	6
>5 µg/m³	7

Using the scores above, the below matrix was implemented to work out the cost-benefit. Higher scores are awarded for those measures which are cheapest with the greatest effect, with the lowest scores awarded for those which will be costly with limited reduction in pollution.

Table 7.4 – Cost Benefit Scoring Matrix

		Estimated Reduction in Pollutant Concentrations						
		>0.5µg/m³	0.5-1 µg/m³	1-2 µg/m³	1-2 µg/m³	**2-3 µg/m³**	**3-4 µg/m³**	**>4 µg/m³**
Cost of Measure	**£10k**	6	8	10	12	14	16	18
	£10k - £50k	5	6	8	10	12	14	16
	£50k - £100k	4	5	6	8	10	12	14
	£100k - £500k	3	4	5	6	8	10	12
	£500k - £1m	2	3	4	5	6	8	10
	£1m - £10m	1	2	3	4	5	6	8
	> £10m	0	1	2	3	4	5	6

The analysis should also account for the feasibility of implementing the measures, with those likely to progress given a higher priority than those which are acknowledged to be a challenge to implement. The feasibility score factors in local influences such as political backing, accessibility to funding options and resources available. As such, each measure was assigned a 'Feasibility score based on the table below. The score from the matrix was multiplied by this score.

Table 7.5 – Feasibility Scores

Feasibility Score	Score
Measure has already been started and just requires progressing	7
Very easy to implement, and political good will towards this, sufficient resources	6
Easy to implement, general political goodwill and available resources	5
Possible to implement but may require some learning/campaigning, moderately time intensive	4
Possible to implement but not straightforward and will require some learning/campaigning, moderately time intensive	3
Challenging to implement, would require some campaigning, time intensive	2
Very Difficult to implement, no political appetite, time, and resource intensive	1

7.2.2 Cost-Benefit Analysis

Following the above assessment, it has been possible to rank the measures by cost, benefit, and feasibility, this is shown in below. With the feasibility weighting meaning that measures which are the easiest to progress are scored higher, these are prioritised.

The results of the cost benefit analysis highlight the importance of feasibility for measure implementation and subsequent completion. Major measures, such as the highway improvements, are likely to see the greatest improvement in air quality across the AQMAs. However, due to their scale, they take considerably more planning and often face greater barriers to implementation (such as funding and implementation) than smaller scale measures. This is reflected in Table 7.6 where lower budget measures such as promoting active transport and anti-idling campaigns are ranked higher than the implementation of local plans and highway improvements. Nevertheless, it is still important to consider and progress measures ranked lower as they can provide additional benefits outside of the direct reduction in emissions.

Table 7.6 – Cost Benefit Analysis of Measures

Measure No.	Measure	Cost	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1	Improve emissions standards for Council Fleet	£50k - £100k	2	1	3	4
2	Improve emissions standards for Buses	£50k - £100k	2	1	3	4
3	Improve emissions standards for Taxis	£50k - £100k	2	1	3	4
4	Working with schools to promote active transport and adoption of Travel Plans	< £10k	1	1	2	6
5	Support the development of cycling and walking infrastructure to increase the use of sustainable transport modes such as walking and cycling	< £10k	1	1	6	6
6	Community Protection will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process	< £10k	1	1	6	6
7	Improve sustainable transport links serving new developments	< £10k	1	1	3	6
8	Local air quality monitoring within the GBC Borough	< £10k	1	1	7	6
9	Make details of the Action Plan measures and annual progress reports GBC available on the www.KentAir.org.uk website to ensure broad access to the consultation and implementation process.	< £10k	1	1	1	6
10	Promote and implement energy efficiency measures	£50K - £100K	2	1	5	4
11	The council will encourage the planting of trees which benefit air quality within the borough through the planning process as well as carry out tree planting programmes on Gravesham owned land	< £10k	1	1	3	6

Measure No.	Measure	Cost	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
12	Provide advice to the public and pursue an advocacy role to assist in minimising the effects of poor air quality in buildings.	< £10k	1	1	2	6
13	Adequate enforcement of on-street parking restrictions	< £10k	1	1	4	6
14	Anti-Idling Campaign	< £10k	1	2	3	8
15	Increase the number of Electric Vehicle charging points in the Borough	£50K - £100K	2	4	3	10
16	To review the Council's own Travel Plan	< £10k	1	1	3	6
17	Work with relevant teams at National Highways to identify actions that can be delivered jointly to improve local air quality or enhance other actions in this plan.	£100k - £500k	4	2	2	4
18	Work with relevant teams at Kent County Highways to identify actions that can be delivered to improve local air quality or enhance other actions in this plan.	£100k - £500k	4	2	5	4
19	Carry out campaigns to raise awareness of the impact of the burning of waste and the emissions of smoke from chimneys in conjunction with establishing robust procedures to deal with smoke nuisance.	< £10k	1	1	2	6

8 Appendix A: Response to Consultation

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

Consultee	Category	Response
National Highways	-	No specific comments to make on the contents of the action plan or measures in the action plan.
Ebbsfleet Development Corporation	Government office	Comments within report which have been included. Additional commentary around the Ebbsfleet Implementation Framework.
Kent County Council	Council	Comments within report which have been included. Additional commentary around the STIPs scheme and “Improving outdoor air quality and health: review of interventions” guidance.
Gravesham Licensing Team	Licensing	Included additional comments for Measure No.3 (Improve emissions standards for Taxis).

9 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)
N/A	N/A	N/A

10 Appendix C: Detailed Modelling Report

11 Glossary of Terms

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'
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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
KCC	Kent County Council
NH	National Highways
KCC	Kent County Council

STIPs	The Strategic Transport Infrastructure Programme