



KENT AND MEDWAY AIR QUALITY MONITORING NETWORK

2021 NETWORK ANNUAL REPORT

Report for: Kent and Medway Air Quality Monitoring Partnership (KMAQP)

Ricardo ref. ED14107

Issue: Issue 1

15/03/2023

Customer:
Tunbridge Wells Borough Council – Kent and
Medway Air Quality Partnership

Customer reference:
KMAQP AQ Network Annual Report 2021

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GLOSSARY

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
CO ₂	Carbon Dioxide
DAQI	Daily Air Quality Index
Limit Value	Legally binding limit
LGV	Light Goods Vehicles (e.g. vans, small trucks)
Target Value	Limits to be attained where possible by taking all necessary measures not entailing disproportionate costs.
LAQM	Local Air Quality Management
Indicative measurement	Measurements which meet data quality objectives that are representative of indicative classification
NAEI	National Atmospheric Emissions Inventory
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides (NO _x = NO + NO ₂)
O ₃	Ozone
PM ₁₀	particles that pass through a size-selective inlet with 50% efficiency at an aerodynamic diameter of 10µm
PM _{2.5}	particles that pass through a size-selective inlet with 50% efficiency at an aerodynamic diameter of 2.5µm
QAQC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

EXECUTIVE SUMMARY

This report provides an overview of the air quality monitoring that was undertaken for the Kent and Medway Air Quality Monitoring Network (KMAQMN) in 2021.

Eighteen automatic air quality monitoring sites were operational during 2021 measuring Nitrogen Dioxide (NO₂), ozone (O₃), particulate matter as PM₁₀ and PM_{2.5} and sulphur dioxide (SO₂). Three of the eighteen sites also form part of the Automatic Urban and Rural Network (AURN).

Ambient NO₂ is also monitored across the KMAQMN via diffusion tubes - a passive monitoring technique that provides “indicative” measurements of NO₂ for comparison against air quality objectives.

Exceedances of the Air Quality Strategy (AQS) Objectives

Only one site, Maidstone Upper Stone Street, exceeded the annual mean limit value of 40 µg m⁻³ in 2021, with a value of 49 µg m⁻³. No sites exceeded the hourly mean objective of 200 µg m⁻³ more than 18 times.

Swale St Pauls Street was the only site that exceeded the 24 hour mean objective for PM₁₀ of 50 µg m⁻³ more than the allowable exceedances of 35 times in a year, with 59 exceedances. No sites exceeded the PM₁₀ or the PM_{2.5} limit values.

Ozone is measured at two sites, Canterbury and Rochester Stoke. For ozone no more than 10 exceedances of the ozone maximum daily 8-hour running mean objective are allowed in an annual year. This was exceeded at the Canterbury site with 17 exceedances.

SO₂ is measured at one site, Rochester Stoke, and all SO₂ objectives for 2021 were met.

Pollution episodes

The Daily Air Quality Index (DAQI) was used to assess the number of days of “Moderate”, “High” and “Very High” pollution.

Episodes of Moderate NO₂ were recorded on three days in 2021 and Moderate ozone was recorded on 14 days during 2021.

For PM, nine monitoring sites recorded Moderate PM₁₀ and 5 sites Moderate PM_{2.5} pollution in 2021. Swale St Pauls Street recorded 8 days of High PM₁₀ pollution and 10 days of Very High PM₁₀ pollution. Maidstone Rural also recorded one day of Very High PM₁₀, but no High or Moderate days. The Very High pollution episodes occurred in February, March and December. Saharan dust transported to the UK in March likely contributed partly to the Very High PM₁₀ observed at Swale St Pauls Street.

Long term trends

Annual mean concentrations from 1998 to 2021 from the KMAQMN sites were compared to the UK averages.

Overall NO₂ and PM₁₀ concentrations have decreased in the UK since the late 1990’s, most likely due to a reduction in emissions as new Euro standard vehicles are introduced into the fleet, and less coal used in energy generation.

Ozone measurements at rural and urban background monitoring stations indicate a possible increasing trend, however ozone concentrations are highly variable year on year, as ozone production depends greatly on the meteorological conditions.

A decreasing trend in sulphur dioxide is observed in the UK average and SO₂ measured at Rochester Stoke over the past few decades - this is due to a reduction in the amount of sulphur in fuels and the move away from power plants that use coal.

Diffusion tube results

Exceedances in the annual mean NO₂ concentrations measured by diffusion tubes in the network were recorded by the following local authorities:

- Five sites by Gravesham Borough Council.
- Six sites by Maidstone Borough Council.
- Three sites by Medway Council.
- One site by Tonbridge and Malling Borough Council.
- Two sites by Tunbridge Wells Borough Council.

1. INTRODUCTION

This report provides details of the air quality monitoring data from the Kent and Medway Air Quality Monitoring Network (KMAQMN) for the calendar year 2021. The network was first formed in 1997 to undertake and report measurements of key air quality pollutants in the Kent and Medway region.

The report presents results and data for nitrogen dioxide (NO₂), particulate Matter (PM₁₀ and PM_{2.5}), ozone (O₃) and sulphur dioxide (SO₂) from the eighteen continuous monitoring stations that were operational in the network in 2021. NO₂ data from the non-continuous NO₂ diffusion tube monitoring network are also presented here.

Summary statistics of all measured air pollutants and comparisons against UK Air Quality Strategy Objectives are provided. The report also includes details of exceedances and periods of significant air pollution episodes in 2021. Long term trends in the pollutant concentrations from the KAQMN are also presented and compared to data from the Automatic Urban and Rural Network (AURN).

2. KENT AND MEDWAY AIR QUALITY NETWORK

2.1 KENTAIR WEBSITE

The KentAir website (<https://kentair.org.uk/>) is a publicly accessible website that contains up to date information, data and resources relating to air quality in the region.

Pages on the site provide important information such as:

- Details on the key ambient pollutants, their sources and impacts on health.
- How the pollutants are monitored.
- The Daily Air Quality Index (DAQI) bands and how these can be used.
- Current legislation, policy, standards and objectives.

The front page includes an interactive map which displays the current DAQI for each monitoring site, and a postcode selector to allow users to zoom into specific locations. Information on the monitoring sites, including photos, reports and statistics is easily accessible via the map. Users can also sign up to air pollution forecasts via the website.

A tab on the front page links to the Care for Air website (<https://care-for-air.kentair.org.uk>), an educational resource which provides information about what causes pollution and how individuals can help to reduce it. Fact sheets and teaching materials can be downloaded, and an emissions calculator can be used to estimate an individual's emissions based on their travel choices.



2.2 AUTOMATIC MONITORING SITES

Eighteen automatic air quality monitoring sites were operational during 2021. Of these eighteen, three are part of the Automatic Urban and Rural Network (AURN).

A map of the locations of the monitoring sites is provided in Figure 1. Details of the pollutants measured at each site is shown in Table 2-1.

Figure 1 Automatic monitoring locations in the KMAQMN (blue circles) and UK national network (red circles).

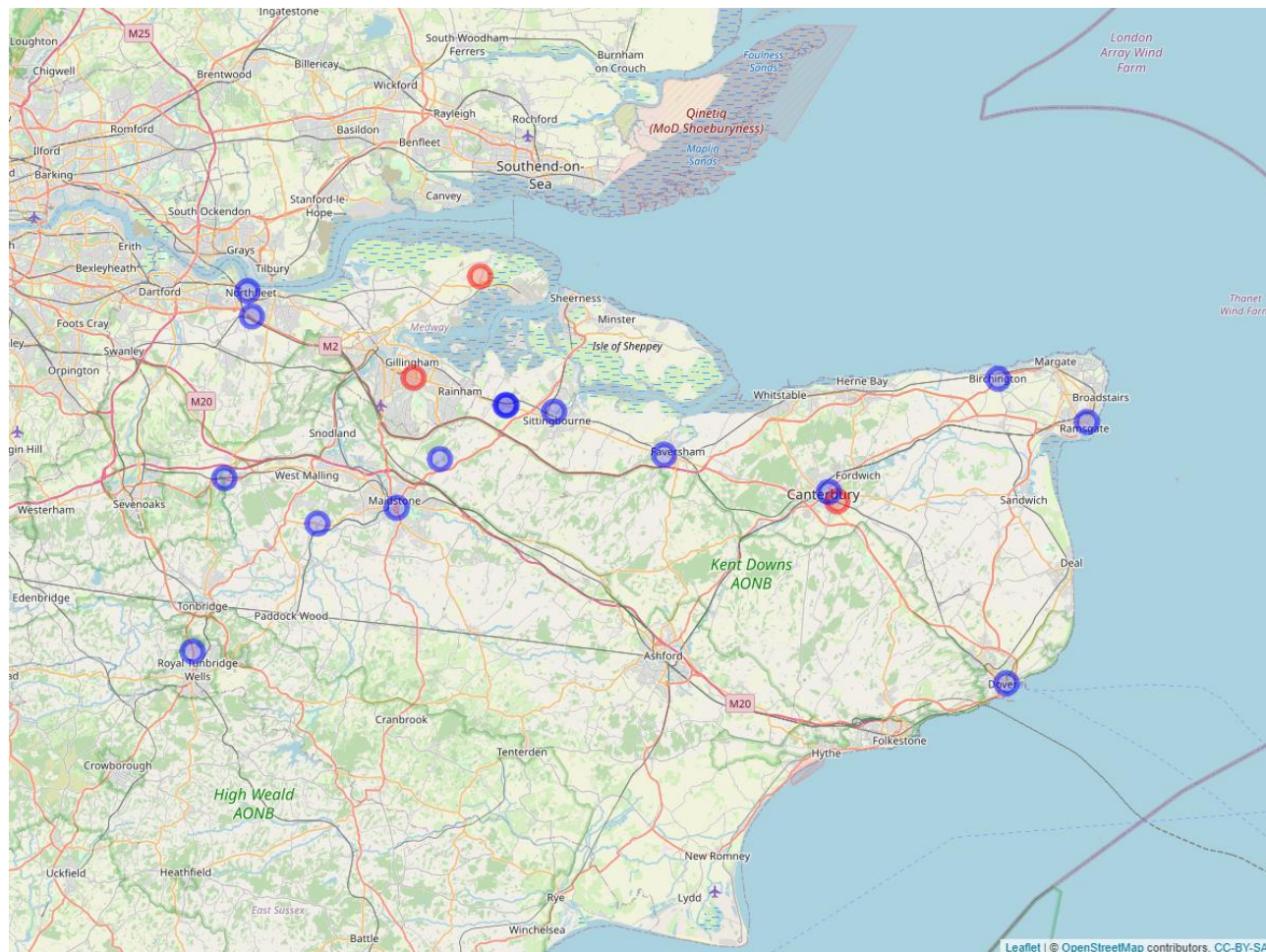


Table 2-1 Automatic monitoring stations within the KMAQMN during 2021

Site Name	Site Type	Network	Start	Pollutants Monitored
Canterbury	Urban background	AURN	02/01/2001	NO ₂ , O ₃
Canterbury Military Road	Roadside	KMAQMN	01/10/2006	NO ₂
Chatham Roadside	Urban traffic	AURN	01/07/2010	NO ₂ , PM ₁₀ , PM _{2.5}
Dover Centre Roadside	Roadside	KMAQMN	21/12/2000	PM ₁₀
Gravesham A2 Roadside	Roadside	KMAQMN	31/12/1998	NO ₂ , PM ₁₀
Gravesham Industrial Background	Urban background	KMAQMN	01/01/1999	NO ₂ , PM ₁₀
Maidstone Rural	Rural	KMAQMN	01/01/1999	NO ₂ , PM ₁₀
Maidstone Upper Stone Street	Roadside	KMAQMN	09/05/2018	NO ₂ , PM ₁₀ , PM _{2.5}
Rochester Stoke	Rural	AURN	26/01/1996	NO ₂ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂
Swale Newington 3 (CLOSED 07/04/2021)	Roadside	KMAQMN	07/01/2011	NO ₂
Swale Newington 4 (OPENED 07/04/2021)	Roadside	KMAQMN	07/04/2021	NO ₂ , PM ₁₀ , PM _{2.5}
Swale Ospringe Roadside 2	Roadside	KMAQMN	15/03/2006	NO ₂ , PM ₁₀ , PM _{2.5}

Site Name	Site Type	Network	Start	Pollutants Monitored
Swale St Pauls Street	Roadside	KMAQMN	21/01/2013	NO ₂ , PM ₁₀ , PM _{2.5}
Thanet Birchington Roadside	Roadside	KMAQMN	19/03/2007	NO ₂ , PM ₁₀
Thanet Ramsgate Roadside	Roadside	KMAQMN	01/01/2003	NO ₂ , PM ₁₀
Tonbridge & Malling, Watringbury Roadside (CLOSED 07/10/2021)	Roadside	KMAQMN	25/06/2018	NO ₂
Tonbridge and Malling, Borough Green Roadside (OPENED 03/08/2021)	Roadside	KMAQMN	10/07/2005	NO ₂ , PM ₁₀
Tunbridge Wells A26 Roadside	Roadside	KMAQMN	20/06/2005	NO ₂ , PM ₁₀

2.3 NETWORK CHANGES IN 2021

In 2021 two stations closed part way through the year: Swale Newington 3 closed on 07/04/21 and Tonbridge & Malling Watringbury Roadside closed on 07/10/21.

In addition, two new stations started measurements in 2021: Swale Newington 4 opened on 07/04/2021 and Tonbridge and Malling, Borough Green Roadside opened on 03/08/2021.

2.4 POLLUTANTS MONITORED

The KMAQMN monitors nitrogen dioxide (NO₂), particulate Matter (PM₁₀ and PM_{2.5}), ozone (O₃) and sulphur dioxide (SO₂) at the automatic monitoring sites. Details of the sources and health impacts of each pollutant and methods for monitoring are provided below:

Nitrogen Dioxide: NO₂ is formed from combustion processes and has a primary (emitted directly) and secondary (formed from chemical reactions in the atmosphere) component. In urban areas road transport is the main source of ambient NO₂. NO₂ can have an adverse effect on human health through inflammation of the airways and can cause issues with the respiratory system, in particular to those with underlying conditions.

Particulate Matter: Particulate matter in the atmosphere has many sources in the UK including combustion and road vehicle emissions. Similarly to NO₂, PM can consist of both primary and secondary sources. Secondary PM can be formed in the atmosphere from precursors such as nitrogen oxides, sulphur dioxide and ammonia. PM can also be transported long distances, therefore increases in PM can often occur in the UK when pollution is transported from the continent. PM₁₀ and PM_{2.5} are monitored in the KMAQMN, these are particles that pass through a size-selective inlet with 50% efficiency at an aerodynamic diameter of 10 and 2.5 µm, respectively. The smaller particles are of particular concern to human health as they can penetrate deep into the lungs. PM can also cause inflammation of the airways and exacerbate symptoms in those with heart and lung diseases. Small particles may also carry surface absorbed carcinogenic compounds into the lungs.

Ozone: Ozone is a secondary pollutant which is formed in the atmosphere via reactions between its precursors - nitrogen oxides (NO_x) and volatile organic compounds (VOCs) - in the presence of sunlight. Ozone and its precursors can travel long distances, therefore the ozone measured at one location, may have originated many miles away. Ozone reacts rapidly with nitrogen oxide (NO), therefore ozone levels are typically lower in urban areas, where NO emissions are higher as a result of emissions from vehicle exhausts. Ozone can cause irritation to the eyes and nose and inflammation to the airways at high concentrations.

Sulphur Dioxide: The main source of SO₂ is from the combustion of fuels which contain sulphur. Exposure to SO₂ can cause irritation and constriction of the airways and exacerbate symptoms in those with underlying respiratory issues. In the atmosphere, SO₂ and water vapour can mix and form acid rain, which can have a destructive effect on the ecosystem.

2.5 MONITORING METHODS

The LAQM Technical Guidance LAQM.TG(22)¹ provides information on the monitoring techniques that can be used to monitor ambient pollutants as part of a local air quality monitoring programme. The KMAQMN includes the following monitoring methods:

- Continuous NO₂ is measured by the chemiluminescence technique, which is the standard reference method of measuring NO, NO₂ and NO_x.
- PM₁₀ is measured by either Tapered Element Oscillating Microbalance (TEOM), Beta Attenuation Monitoring (BAM) or a fine dust monitoring system (FIDAS). PM_{2.5} is measured by BAM or FIDAS. Correction factors to the data are required for the TEOM and BAMs before comparisons to air quality standards, as described in the LAQM Technical Guidance LAQM.TG(22). PM₁₀ data from the TEOMs are corrected using the volatile correction model (VCM)² developed by King's College. PM₁₀ data from the BAM is corrected using a multiplication value of 0.833. No corrections are necessary for PM_{2.5} data.
- Ozone is measured using the standard ultraviolet (UV) absorption technique.
- SO₂ is measured by the UV fluorescence technique.

Ambient NO₂ is also monitored in the KMAQMN by diffusion tubes. Diffusion tubes are a passive monitoring technique that provides "indicative" measurements of NO₂ for comparison against air quality objectives. The tubes are exposed over 4-5 weeks, approximately coinciding with monthly periods, and an annual mean calculated from the data. NO₂ diffusion tubes are known to have biases, when compared to chemiluminescence NO₂ measurements, therefore the annual means from the tubes are required to be bias corrected, using local or national correction factors. If there is less than 9 months of data in a calendar year, the annual means are also required to be annualised, using local data from nearby automatic monitoring stations.

3. AUTOMATIC MONITORING RESULTS

3.1 NETWORK DATA CAPTURE

Table 3-1 shows the data capture rates for each site and pollutant measured during 2021. The target annual data capture rate is 90 %, however, those analysers with a data capture greater than 75% can still provide representative annual means. Analysers with a data capture rate below 75% not representative of the full year.

Table 3-1 Data capture rates, 2021. Red values represent data capture rates < 90 %.

Site Name	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
Canterbury	97.6			99.3	
Canterbury Military Road	98.9				
Chatham Roadside	99.1	96.8	95.1		
Dover Centre Roadside		60.2 ^(c)			
Gravesham A2 Roadside	91.6	98.4			
Gravesham Industrial Background	97.3	98.8			
Maidstone Rural	89.9	96.9			
Maidstone Upper Stone Street	98.5	97.2	97.8		
Rochester Stoke	96.2	99.4	99.4	99.2	81.7 ^(d)

¹ <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

² <http://www.volatile-correction-model.info/>

Site Name	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
Swale Newington 3	26.4 ^(b)				
Swale Newington 4	73.1 ^(a)	71.1 ^(a)	66.7 ^(a)		
Swale Ospringe Roadside 2	99.2	98.5			
Swale St Pauls Street	96.2	92.5	94.5		
Thanet Birchington Roadside	92.4	91.0			
Thanet Ramsgate Roadside	99.7	96.6			
Tonbridge & Malling, Wateringbury Roadside	69.1 ^(a)				
Tonbridge and Malling, Borough Green Roadside	41.2 ^(b)	49.7 ^(b)			
Tunbridge Wells A26 Roadside	99.5	99.2			
Total Number of sites	17	14	5	2	1
Number of sites DC ≥ 90%	12	11	4	2	0

^(a) New site - opened part way through the year.

^(b) Site closed part way through the year.

^(c) Dover Centre had power supply issues throughout the year.

^(d) The SO₂ analyser at Rochester Stoke suffered from multiple faults and was swapped.

3.2 COMPARISON WITH AQS OBJECTIVES

Table 3-2 provides an overview of the Air Quality Strategy Objectives applicable to local authorities in England (objectives for some pollutants are different in Scotland). The UK air quality objectives were originally transposed into UK law from the European Commission Directive on Ambient Air Quality and Cleaner Air for Europe³. Since leaving the EU, the UK is no longer tied to the EU limits, however, current objectives in the UK are based on those stated in the Directive.

Table 3-2 Air Quality Strategy Objectives (applicable to local authorities in England).

Pollutant	Limit Value	Averaging Period
Nitrogen Dioxide (NO ₂)	200 µgm ⁻³ not to be exceeded more than 18 times a year	1-hour mean
	40 µgm ⁻³	Annual mean
Particulate Matter (PM ₁₀)	50 µgm ⁻³ not to be exceeded more than 35 times a year	24-hour mean
	40 µgm ⁻³	Annual mean
Particulate Matter (PM _{2.5})	20 µgm ⁻³	Annual mean
Sulphur dioxide (SO ₂)	266 µgm ⁻³ not to be exceeded more than 35 times a year	15-minute mean
	350 µgm ⁻³ not to be exceeded more than 24 times a year	1-hour mean
	125 µgm ⁻³ not to be exceeded more than 3 times a year	24-hour mean
Ozone (O ₃)	100 µgm ⁻³ not to be exceeded more than 10 times a year	Daily maximum running 8-hour mean

³ European Commission, "DIRECTIVE 2008/50/EC OF The European Parliament And Of The Council of 21 May 2008 On Ambient Air Quality And Cleaner Air For Europe," 2008. [Online]. Available: <https://www.legislation.gov.uk/eudr/2008/50/contents>.

Table 3-3 shows the annual mean concentrations for all pollutants measured in the network, at each site. One site, Maidstone Upper Stone Street, exceeded the annual mean limit value of 40 $\mu\text{g}\text{m}^{-3}$ in 2021, with a value of 49 $\mu\text{g}\text{m}^{-3}$. No sites exceeded the PM_{10} annual mean limit value of 40 $\mu\text{g}\text{m}^{-3}$, or the $\text{PM}_{2.5}$ limit value of 20 $\mu\text{g}\text{m}^{-3}$.

Table 3-3 Annual mean concentrations, 2021. Values in red indicate those which exceed the relevant annual mean objective or target (applicable to NO_2 , PM_{10} and $\text{PM}_{2.5}$ only)

Site Name	NO_2	PM_{10}	$\text{PM}_{2.5}$	O_3	SO_2
Canterbury	10.0			52.1	
Canterbury Military Road	21.0				
Chatham Roadside	18.9	17.5	12.3		
Dover Centre Roadside		20.8 ^(a)			
Gravesham A2 Roadside	22.8	16			
Gravesham Industrial Background	21.0	20.6			
Maidstone Rural	7.5	13.3			
Maidstone Upper Stone Street	49.0	21.7	14.0		
Rochester Stoke	10.7	15.0	10.3	55.2	1.0
Swale Newington 3	23.9 ^(b)				
Swale Newington 4	22.6 ^(a)	17.1 ^(a)	11.8 ^(a)		
Swale Ospringe Roadside 2	23.5	23.3			
Swale St Pauls Street	30.6	37.1	11.3		
Thanet Birchington Roadside	24.7	21.1			
Thanet Ramsgate Roadside	15.9	22.3			
Tonbridge & Malling Watringbury Roadside	18.3 ^(a)				
Tonbridge and Malling, Borough Green Roadside	22.9 ^(a)	24.0 ^(a)			
Tunbridge Wells A26 Roadside	25.7	18.6			

^(a) Data has been annualised as the annual data capture < 75 %

^(b) Data capture rate = 26.4 % therefore data not representative of annual mean

A comparison of 2021 data with short-term Air Quality Strategy Objectives is provided in Table 3-4. No site exceeded the hourly mean objective of 200 $\mu\text{g}\text{m}^{-3}$ more than 18 times in 2021.

Swale St Pauls Street exceeded the 24 hour mean objective for PM_{10} of 50 $\mu\text{g}\text{m}^{-3}$ 59 times in 2021, which is much greater than the allowable exceedances of 35 times in a year. Seven other sites also observed 24 hour mean PM_{10} greater than 50 $\mu\text{g}\text{m}^{-3}$, however the number of days was below 35 for these sites.

Ozone is measured at two sites, Canterbury and Rochester Stoke, both these sites are part of the AURN. The Canterbury site measured 17 exceedances of the ozone maximum daily 8-hour running mean objective which is more than the 10 exceedances allowed. Rochester Stoke measured 9 exceedances of the ozone maximum daily 8-hour running mean objective.

SO_2 is measured at one site, Rochester Stoke, and all SO_2 objectives for 2021 were met.

Table 3-4 Number of exceedances of short term objectives in 2021. Values in red indicate those which exceed the relevant short-term mean objective more than the permitted number of times.

Site Name	NO ₂	PM ₁₀	O ₃	SO ₂		
	1 hour	24 hour	Daily max running 8-hour	24 hour	1 hour	15 min
Canterbury	0	0	9			
Canterbury Military Road	0					
Chatham Roadside	0	0				
Dover Centre Roadside		0 ^(b)				
Gravesham A2 Roadside	0	0				
Gravesham Industrial Background	0	1				
Maidstone Rural	0	1				
Maidstone Upper Stone Street	5	3				
Rochester Stoke	0	3	17	0	0	0
Swale Newington 3	0 ^(a)					
Swale Newington 4	0 ^(a)	0 ^(b)				
Swale Ospringe Roadside 2	1	12				
Swale St Pauls Street	0	59				
Thanet Birchington Roadside	0	1				
Thanet Ramsgate Roadside	0	0				
Tonbridge & Malling Wateringbury Roadside	0 (71) ^(a)					
Tonbridge and Malling, Borough Green Roadside	0 (96.4) ^(a)	6 (45.4) ^(b)				
Tunbridge Wells A26 Roadside	0	1				

(a) Data capture < 85% therefore the 99.8th percentile of 1-hour means is provided in brackets (where provided in the council's ASR).

(b) Data capture < 85% therefore the 90.4th percentile of 24-hour means is provided in brackets (where provided in the council's ASR).

3.3 DAILY AIR QUALITY INDEX (DAQI)

The Daily Air Quality Index (DAQI)⁴ is used to provide information on air pollution levels and recommendations on the actions that can be taken depending on the index value. The index ranges from 1 to 10 and is sub categorised into 4 bands (Low, Moderate, High, Very High). The bands are based on recommendations from the Committee on the Medical Effects of Air Pollutants (COMEAP). An overview of the bands for O₃, NO₂, SO₂ PM_{2.5} and PM₁₀ is provided in Table 3-5.

Table 3-5 Daily Air Quality Index (DAQI) bands for each pollutant.

Index	Band	Ozone 8 Hourly Mean (µgm ⁻³)	Nitrogen Dioxide Hourly Mean (µgm ⁻³)	Sulphur Dioxide 15 Minute Mean (µgm ⁻³)	PM _{2.5} Daily Mean (µgm ⁻³)	PM ₁₀ Daily Mean (µgm ⁻³)
1	Low	0-33	0-67	0-88	0-11	0-16

⁴ <https://uk-air.defra.gov.uk/air-pollution/daq/?view=more-info>

Index	Band	Ozone 8 Hourly Mean (µgm ⁻³)	Nitrogen Dioxide Hourly Mean (µgm ⁻³)	Sulphur Dioxide 15 Minute Mean (µgm ⁻³)	PM _{2.5} Daily Mean (µgm ⁻³)	PM ₁₀ Daily Mean (µgm ⁻³)
2	Low	34-66	68-134	89-177	12-23	17-33
3	Low	67-100	135-200	178-266	24-35	34-50
4	Moderate	101-120	201-267	267-354	36-41	51-58
5	Moderate	121-140	268-334	355-443	42-47	59-66
6	Moderate	141-160	335-400	444-532	48-53	67-75
7	High	161-187	401-467	533-710	54-58	76-83
8	High	188-213	468-534	711-887	59-64	84-91
9	High	214-240	535-600	888-1064	65-70	92-100
10	Very High	241 or more	601 or more	1065 or more	71 or more	101 or more

The overall DAQI for a specific site is calculated as the highest index from each the five different pollutants and actions and health advice provided for each of the bandings, as shown in Table 3-6.

Table 3-6 DAQI bandings and associated actions and health advice. Taken from <https://uk-air.defra.gov.uk/air-pollution/daq>

Air Pollution Banding	Index Value	Accompanying health messages for at-risk individuals*	Accompanying health messages for the general population
Low	1-3	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities.
Moderate	4-6	Adults and children with lung problems, and adults with heart problems, who experience symptoms , should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
High	7-9	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.
Very High	10	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.	Reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

*Adults and children with heart or lung problems are at greater risk of symptoms. Follow your doctor's usual advice about exercising and managing your condition. It is possible that very sensitive individuals may experience health effects even on Low air pollution days. Anyone experiencing symptoms should follow the guidance provided below.

Table 3-7 to Table 3-11 show the number of days when a Moderate or above DAQI was recorded at each monitoring site in 2021 for the different pollutants. The results for each pollutant are considered below.

NO₂: There were no instances of High or Very High NO₂ concentrations recorded at any site in the network in 2021. Maidstone Upper Stone Street recorded two days where NO₂ was Moderate, and Swale Ospringe Roadside 2 recorded one day of Moderate NO₂.

PM₁₀: Nine of the 14 monitoring stations recorded at least one day with Moderate or above DAQI for PM₁₀. Swale St Pauls Street observed the highest number of Moderate or above days for PM₁₀, recording 41 days in the Moderate band, 8 days in the High band and 10 days in the Very High band. Maidstone Rural did not observe any Moderate or High days of PM₁₀ but did observe Very High PM₁₀ on one day in 2021.

PM_{2.5}: Four of the five sites monitoring PM_{2.5} observed PM_{2.5} in the Moderate band, and one of these sites (Swale St Pauls Street) also observed High PM_{2.5} on one day in 2021.

O₃: Canterbury and Rochester Stoke observed 9 days and 13 days, respectively of Moderate O₃ concentrations. There were no instances of High or Very High O₃.

SO₂: There were no days when the SO₂ concentrations measured at the Rochester Stoke site reached the Moderate or above band.

Further information on the days when Moderate or high pollution was observed is provided in Section 3.4.

Table 3-7 Numbers of days with "Moderate" or above NO₂ concentrations in 2021.

Site Name	Moderate	High	Very High
Canterbury	0	0	0
Canterbury Military Road	0	0	0
Chatham Roadside	0	0	0
Gravesham A2 Roadside	0	0	0
Gravesham Industrial Background	0	0	0
Maidstone Rural	0	0	0
Maidstone Upper Stone Street	2	0	0
Rochester Stoke	0	0	0
Swale Newington 3 ^(a)	0	0	0
Swale Newington 4 ^(a)	0	0	0
Swale Ospringe Roadside 2	1	0	0
Swale St Pauls Street	0	0	0
Thanet Birchington Roadside	0	0	0
Thanet Ramsgate Roadside	0	0	0
Tonbridge & Malling, Watlingbury Roadside ^(a)	0	0	0
Tonbridge and Malling, Borough Green Roadside ^(a)	0	0	0
Tunbridge Wells A26 Roadside	0	0	0

^(a)Annual data capture < 75 %, therefore some pollution episodes may not have been recorded

Table 3-8 Numbers of days with "Moderate" or above PM₁₀ concentrations in 2021.

Site Name	Moderate	High	Very High
Chatham Roadside	0	0	0
Dover Centre Roadside	0	0	0
Gravesham A2 Roadside	0	0	0
Gravesham Industrial Background	1	0	0
Maidstone Rural	0	0	1
Maidstone Upper Stone Street	3	0	0
Rochester Stoke	3	0	0
Swale Newington 4 ^(a)	0	0	0
Swale Ospringe Roadside 2	11	1	0
Swale St Pauls Street	41	8	10
Thanet Birchington Roadside	1	0	0
Thanet Ramsgate Roadside	0	0	0
Tonbridge and Malling, Borough Green Roadside ^(a)	6	0	0
Tunbridge Wells A26 Roadside	1	0	0

^(a)Annual data capture < 75 %, therefore some pollution episodes may not have been recorded

Table 3-9 Numbers of days with "Moderate" or above PM_{2.5} concentrations in 2021.

Site Name	Moderate	High	Very High
Chatham Roadside	3	0	0
Maidstone Upper Stone Street	4	0	0
Rochester Stoke	5	0	0
Swale Newington 4 ^(a)	0	0	0
Swale St Pauls Street	2	1	0

^(a)Annual data capture < 75 %, therefore some pollution episodes may not have been recorded

Table 3-10 Numbers of days with "Moderate" or above O₃ concentrations in 2021.

Site Name	Moderate	High	Very High
Canterbury	9	0	0
Rochester Stoke	13	0	0

Table 3-11 Numbers of days with "Moderate" or above SO₂ concentrations in 2021.

Site Name	Moderate	High	Very High
Rochester Stoke	0	0	0

3.4 SIGNIFICANT AIR POLLUTION EPISODES

Table 3-12 shows the days when at least one of the pollutants (NO₂, PM₁₀, PM_{2.5}, O₃ and SO₂) observed Moderate or higher pollution. Section 3.2 illustrates the limit values.

Table 3-12 Dates when one or more pollutants were in the moderate or higher band.

Date	NO ₂ DAQI	PM ₁₀ DAQI	PM _{2.5} DAQI	O ₃ DAQI	SO ₂ DAQI
06/01/2021	Index5	Index2	Index1	Index2	Index1
13/02/2021	Index1	Index5	Index2	Index3	Index1
17/02/2021	Index4	Index2	Index1	Index3	Index1
21/02/2021	Index2	Index10	Index2	Index3	Index1
24/02/2021	Index2	Index10	Index2	Index3	Index1
25/02/2021	Index2	Index10	Index2	Index2	Index1
26/02/2021	Index3	Index9	Index2	Index3	Index1
27/02/2021	Index2	Index5	Index3	Index2	Index1
01/03/2021	Index2	Index8	Index3	Index2	Index1
02/03/2021	Index2	Index10	Index5	Index1	Index1
03/03/2021	Index2	Index10	Index7	Index1	No Data
08/03/2021	Index2	Index5	Index4	Index2	No Data
09/03/2021	Index2	Index5	Index3	Index2	No Data
22/03/2021	Index3	Index10	Index2	Index2	No Data
23/03/2021	Index2	Index10	Index2	Index3	No Data
24/03/2021	Index2	Index7	Index3	Index3	No Data
25/03/2021	Index2	Index5	Index1	Index3	No Data
29/03/2021	Index2	Index5	Index2	Index3	No Data
30/03/2021	Index3	Index10	Index3	Index3	No Data
31/03/2021	Index3	Index10	Index3	Index3	No Data
01/04/2021	Index2	Index6	Index2	Index3	Index1
13/04/2021	Index2	Index4	Index2	Index3	Index1
16/04/2021	Index2	Index3	Index2	Index4	Index1
19/04/2021	Index2	Index5	Index2	Index4	Index1
20/04/2021	Index3	Index6	Index4	Index3	Index1
21/04/2021	Index2	Index6	Index2	Index3	Index1
22/04/2021	Index2	Index5	Index1	Index3	Index1
23/04/2021	Index2	Index6	Index1	Index3	Index1
27/04/2021	Index2	Index6	Index2	Index3	Index1
28/04/2021	Index2	Index6	Index2	Index4	Index1
03/05/2021	Index1	Index3	Index2	Index4	No Data
11/05/2021	Index2	Index5	Index1	Index3	No Data
20/05/2021	Index2	Index6	Index1	Index3	Index1
27/05/2021	Index2	Index5	Index2	Index3	Index1
28/05/2021	Index2	Index8	Index2	Index3	Index1
01/06/2021	Index2	Index4	Index2	Index5	Index1

02/06/2021	Index2	Index6	Index3	Index6	Index1
03/06/2021	Index2	Index3	Index2	Index4	Index1
07/06/2021	Index2	Index6	Index1	Index3	Index1
14/06/2021	Index2	Index3	Index2	Index4	Index1
15/06/2021	Index1	Index2	Index1	Index4	Index1
24/06/2021	Index2	Index7	Index2	Index3	Index1
02/07/2021	Index2	Index9	Index2	Index3	Index1
19/07/2021	Index2	Index4	Index2	Index2	Index1
20/07/2021	Index2	Index4	Index2	Index3	Index1
21/07/2021	Index2	Index4	Index3	Index4	Index1
24/07/2021	Index2	Index4	Index3	Index3	Index1
04/08/2021	Index2	Index4	Index2	Index4	Index1
06/09/2021	Index2	Index4	Index3	Index4	Index1
07/09/2021	Index2	Index5	Index4	Index5	Index1
08/09/2021	Index3	Index5	Index5	Index5	Index1
14/09/2021	Index2	Index4	Index3	Index3	Index1
22/09/2021	Index2	Index8	Index2	Index3	Index1
07/10/2021	Index2	Index5	Index2	Index2	Index1
08/10/2021	Index2	Index4	Index2	Index3	Index1
09/10/2021	Index2	Index5	Index3	Index2	Index1
02/11/2021	Index2	Index5	Index2	Index2	Index1
08/11/2021	Index5	Index5	Index2	Index2	Index1
11/11/2021	Index2	Index5	Index2	Index2	Index1
15/11/2021	Index2	Index5	Index2	Index1	Index1
16/11/2021	Index2	Index4	Index2	Index2	Index1
23/11/2021	Index2	Index5	Index2	Index2	Index1
24/11/2021	Index2	Index5	Index3	Index1	Index1
02/12/2021	Index2	Index6	Index1	Index2	Index1
15/12/2021	Index2	Index4	Index2	Index2	Index1
16/12/2021	Index2	Index10	Index2	Index2	Index1
17/12/2021	Index2	Index5	Index2	Index2	Index1
21/12/2021	Index3	Index10	Index3	Index2	Index1

3.4.1 Nitrogen Dioxide Episodes

Figure 2 shows the maximum hourly concentration recorded each day in 2021 for the two sites where Moderate NO₂ concentrations were recorded. The limit values that set the thresholds for episodes are described in Section 3.2.

Moderate NO₂ was observed on three days with maximum hourly NO₂ concentrations recorded at:

- **298 µgm⁻³** on 6th January at Maidstone Upper Stone Street
- **203 µgm⁻³** on 17th February at Maidstone Upper Stone Street
- **274 µgm⁻³** on 8th November at Swale Ospringe Roadside 2

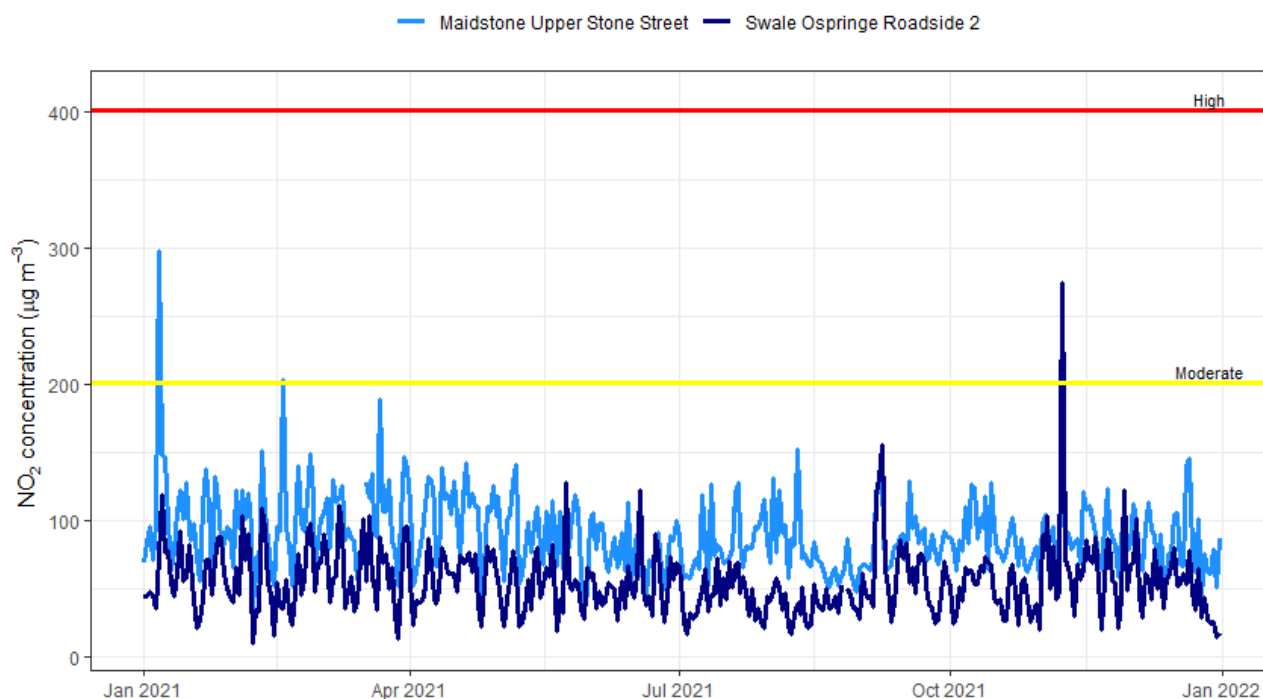
Upper Stone Street typically records the highest NO₂ concentrations in the Borough, and the annual mean NO₂ concentration exceeded the AQS objective in 2021.

The moderate NO₂ episode on 17th February was for 1 hour at midday, therefore may be the result of heavy traffic and/or idling vehicles during this period.

The episode on 6th January lasted for at least 4 hours. Hourly NO₂ exceeded 200 µg m⁻³ from 3pm until 7pm, however, there were also routine engineer and LSO site visits on this day which led to data gaps. Data and scaling have been assessed to rule out these visits as the cause of the high readings. There were no instrument faults recorded but it was a still, cold day, there may have been a localised source, such as roadworks combining with meteorological conditions.

The moderate NO₂ episode at Swale Ospringe Roadside 2 occurred just before midday for one hour. NO concentrations at the same site were also very high this hour (~800 µg m⁻³), suggesting that a local source, such as traffic resulted in the elevated levels of NOx.

Figure 2: Maximum Hourly Mean NO₂ concentrations for each day during 2021 at Maidstone Upper Stone Street and Swale Ospringe Roadside 2.



3.4.2 Particulate Matter Episodes

During 2021 a large number of particulate matter episodes occurred at sites in the Kent region. The limit values that set the thresholds for episodes are described in Section 3.2. Figure 3 shows the daily mean PM₁₀ concentrations for each site during 2021. Very High PM₁₀ were recorded on the following dates:

- 21st February, **110 µg m⁻³** at Maidstone Rural
- 24th February, **106 µg m⁻³** at Swale St Pauls Street
- 25th February, **103 µg m⁻³** at Swale St Pauls Street
- 2nd March, **119 µg m⁻³** at Swale St Pauls Street
- 3rd March, **121 µg m⁻³** at Swale St Pauls Street
- 22nd March, **137 µg m⁻³** at Swale St Pauls Street
- 23rd March, **136 µg m⁻³** at Swale St Pauls Street
- 30th March, **107 µg m⁻³** at Swale St Pauls Street

- 31st March, **124 μgm^{-3}** at Swale St Pauls Street
- 16th December, **146 μgm^{-3}** at Swale St Pauls Street
- 21st December, **155 μgm^{-3}** at Swale St Pauls Street

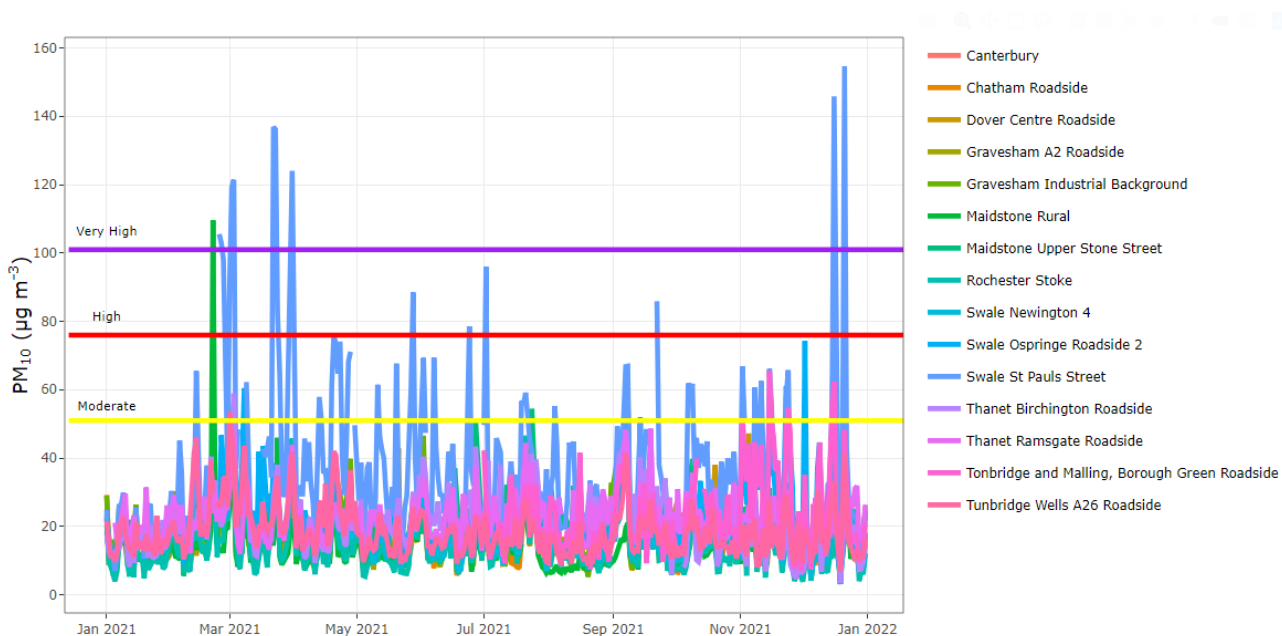
PM_{2.5} concentrations also reached the High band on 3rd March at Swale St Pauls Street, with a PM₁₀ concentration of **59 μgm^{-3}** recorded on that day.

During the Very High PM₁₀ episodes in March 2021, Moderate pollution was also observed across England with High pollution in Yorkshire & Humberside and East Midlands on 3rd March⁵ and High pollution observed in Greater London on 31st March⁶. Moderate PM₁₀ was also observed at some of the sites in the Kent and Medway region between 1st and 3rd March, as shown in Figure 3.

It is likely that Saharan dust events in early and late March, which brought elevated PM from the south to the UK, contributed to these episodes. However, a large proportion of the PM₁₀ at Swale St Paul’s Street is likely to be from local emissions, resulting in the Very High PM₁₀ episodes.

During winter, episodes of elevated PM can occur as dispersion is reduced under cold and stable weather conditions, coupled with an increase in the use of wood burners for residential heating. The met office reports that high pressure built around mid-December and temperatures turned cold in England from 16th to 21st December⁷. This may be why Very High PM₁₀ episodes were observed on 16th and 21st December 2021 at Swale St Pauls Street.

Figure 3: Daily mean PM₁₀ concentrations for each site during 2021.

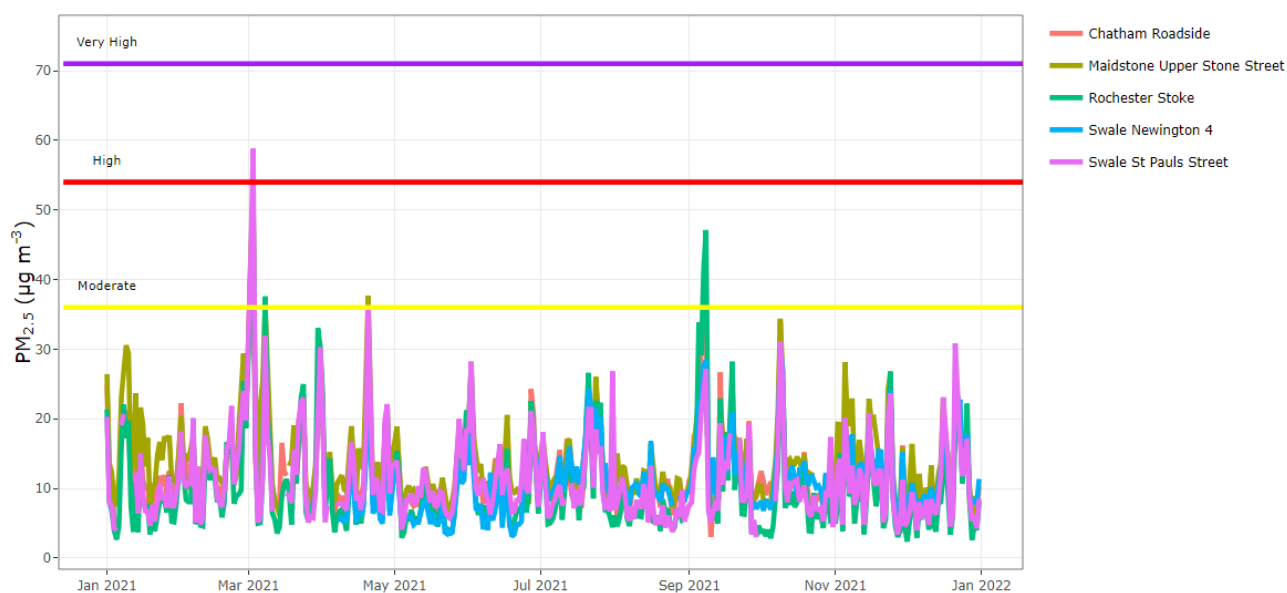


⁵ https://uk-air.defra.gov.uk/latest/measurement-summary-map?zone_id=12&date=03%2F03%2F2021#summary

⁶ https://uk-air.defra.gov.uk/latest/measurement-summary-map?date=31%2F03%2F2021&zone_id=12#summary

⁷ https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/summaries/uk_monthly_climate_summary_202112.pdf

Figure 4: Daily mean PM_{2.5} concentrations for each site during 2021.



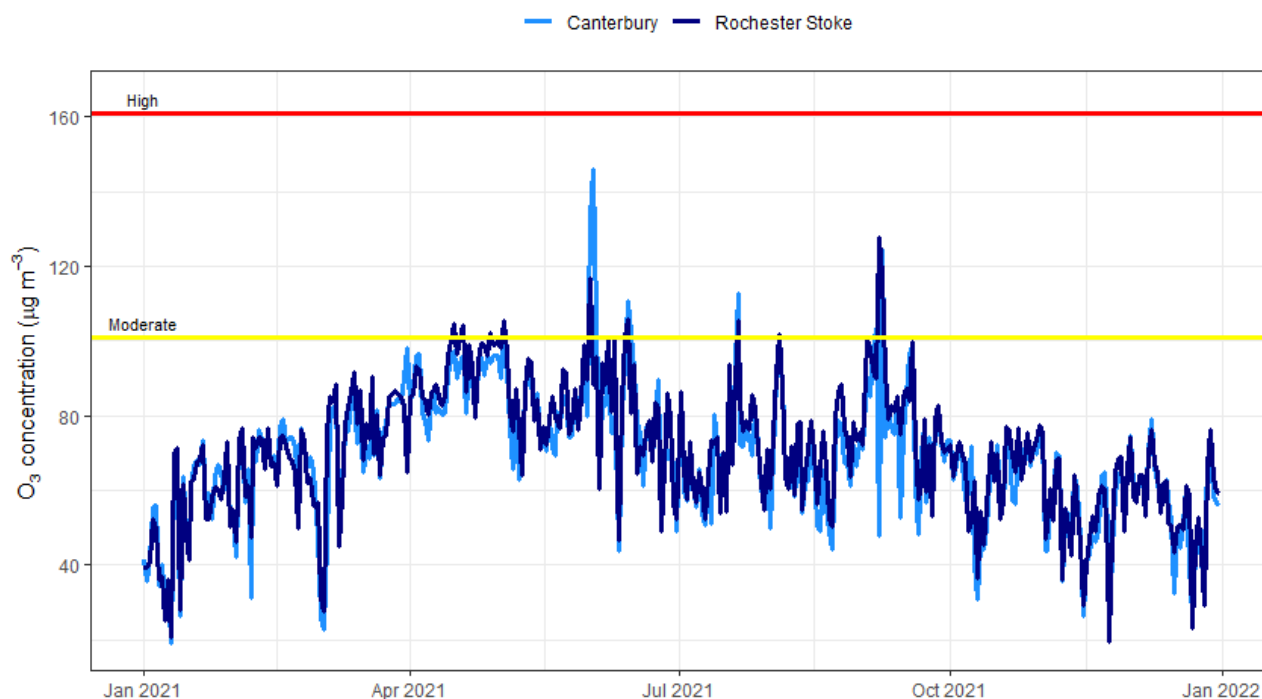
3.4.3 Ozone Episodes

Figure 5 shows the daily maximum 8-hour running mean ozone concentrations during 2021 for Canterbury and Rochester Stoke. The limit values that set the thresholds for episodes are described in Section 3.2.

Moderate ozone occurred on 14 days during 2021. Ozone concentrations recorded on those days were:

- 16th April, **105 µgm⁻³** at Rochester Stoke
- 19th April, **104 µgm⁻³** at Rochester Stoke
- 28th April, **102 µgm⁻³** at Rochester Stoke
- 3rd May, **105 µgm⁻³** at Rochester Stoke
- 1st June, **117 µgm⁻³** at Rochester Stoke and **133 µgm⁻³** at Canterbury
- 2nd June, **146 µgm⁻³** at Rochester Stoke
- 3rd June, **106 µgm⁻³** at Rochester Stoke
- 14th June, **106 µgm⁻³** at Rochester Stoke and **111 µgm⁻³** at Canterbury
- 15th June, **102 µgm⁻³** at Rochester Stoke
- 21st July, **106 µgm⁻³** at Rochester Stoke and **113 µgm⁻³** at Canterbury
- 4th August, **102 µgm⁻³** at Rochester Stoke
- 6th September, **103 µgm⁻³** at Rochester Stoke
- 7th September, **128 µgm⁻³** at Rochester Stoke
- 8th September, **118 µgm⁻³** at Rochester Stoke and **125µgm⁻³** at Canterbury

Figure 5: Ozone maximum 8-hour running mean concentrations for each day during 2021 at Canterbury and Rochester Stoke.



As discussed in Section 2.4, ozone is formed in the atmosphere via reactions between NO_x and VOCs under the presence of sunlight. Therefore, ozone pollution episodes typically occur during the spring and summer months, when the conditions are favourable for ozone production – warm temperatures, sunshine and stable conditions. Ozone can remain in the troposphere (lower part of the atmosphere) for many days and even weeks, so the ozone measured in one location may actually be formed much further downwind. High ozone episodes are typically observed in rural locations (such as Rochester Stoke), as there is limited NO available to react and remove ozone from the atmosphere.

3.5 LONG TERM TRENDS

To assess the changes in pollutant concentrations over time, plots of the annual mean concentrations from 1998 to 2021 have been produced. The annual means for each pollutant and site are compared to the UK averages. For NO₂, PM₁₀, PM_{2.5} and O₃ the UK average annual means are taken from the air quality statistics tables available from Defra⁸. SO₂ UK annual means have been calculated from the hourly SO₂ data, downloaded from UKAir⁹. All annual means are calculated for those years when the data capture rate is 75% or above.

Figure 6 shows long term trends in NO₂ from rural, urban background and traffic monitoring stations in the KMAQMN along with UK averages from 1998 to 2021. NO₂ concentrations in general have decreased in the UK since the late 1990's, most likely due to a reduction in emissions as new Euro standard vehicles are introduced into the fleet, and less coal used in energy generation. The annual means measured by the monitoring sites in the KMAQMN have been declining, following the trend observed in the UK averages. Annual mean NO₂ concentrations dropped in 2020, most likely as a result of the reduced traffic during the Covid-19 lockdowns in the UK. The UK average indicates a slight increase in NO₂ concentrations in 2021, which is also observed at some of the sites in the KMAQMN, however, the measured NO₂ concentrations in 2021 have not gone back to 2019 levels.

⁸ <https://www.gov.uk/government/statistical-data-sets/env02-air-quality-statistics>

⁹ https://uk-air.defra.gov.uk/data/data_selector

Some sites in the KMAQMN observe annual mean NO₂ concentrations much greater than the UK average. As a large source of NO₂ emissions, particularly in urban areas, is from road transport, the measured NO₂ concentrations at different sites can vary greatly, depending on the location of the site and the local traffic volumes. Some boroughs have more industrial areas and are subsequently trafficked with a heavier fleet than average in more urban areas.

Figure 6: Trends in NO₂ annual means concentrations from rural, urban background and traffic monitoring stations in the KMAQMN, alongside the UK average from 1998 to 2021.

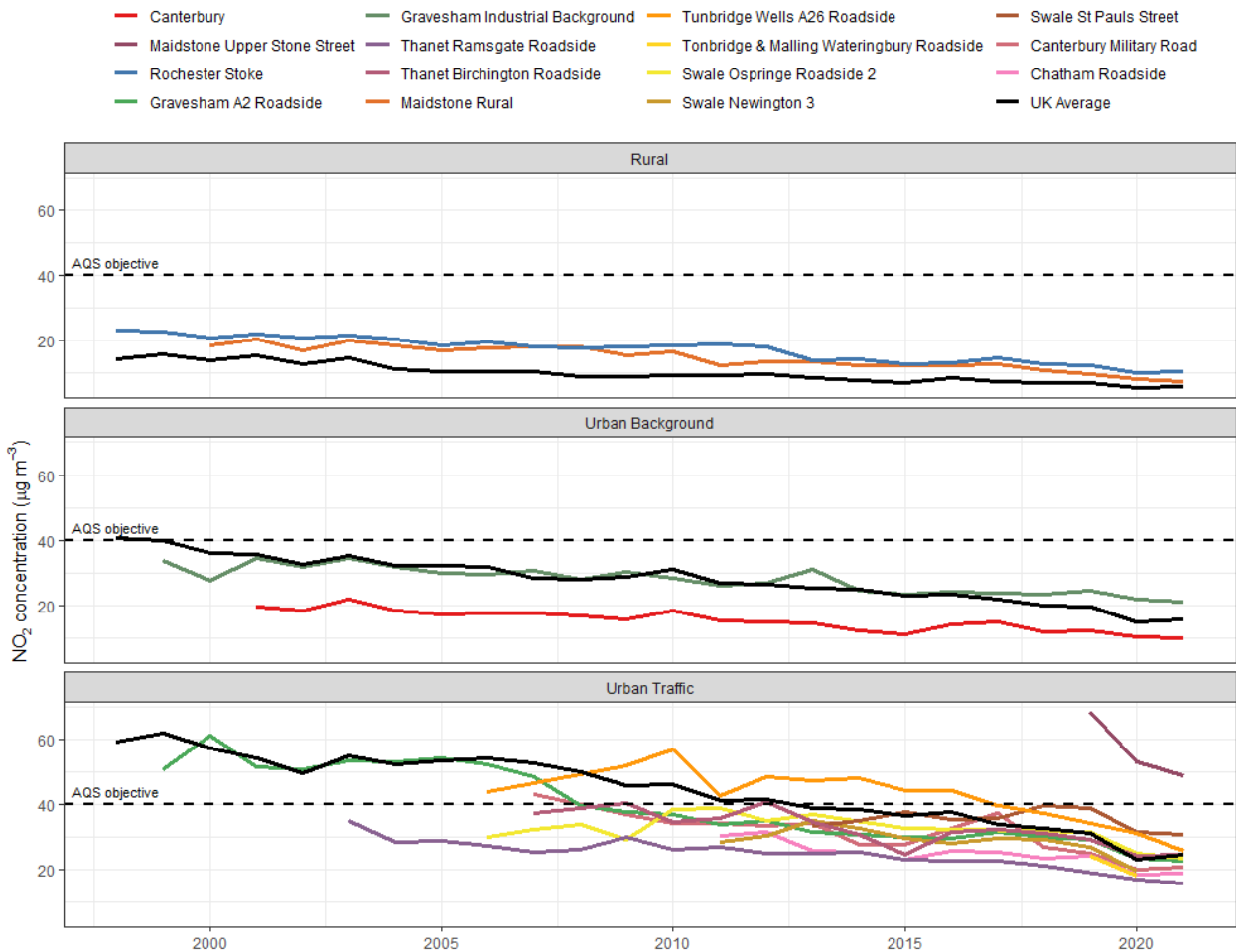
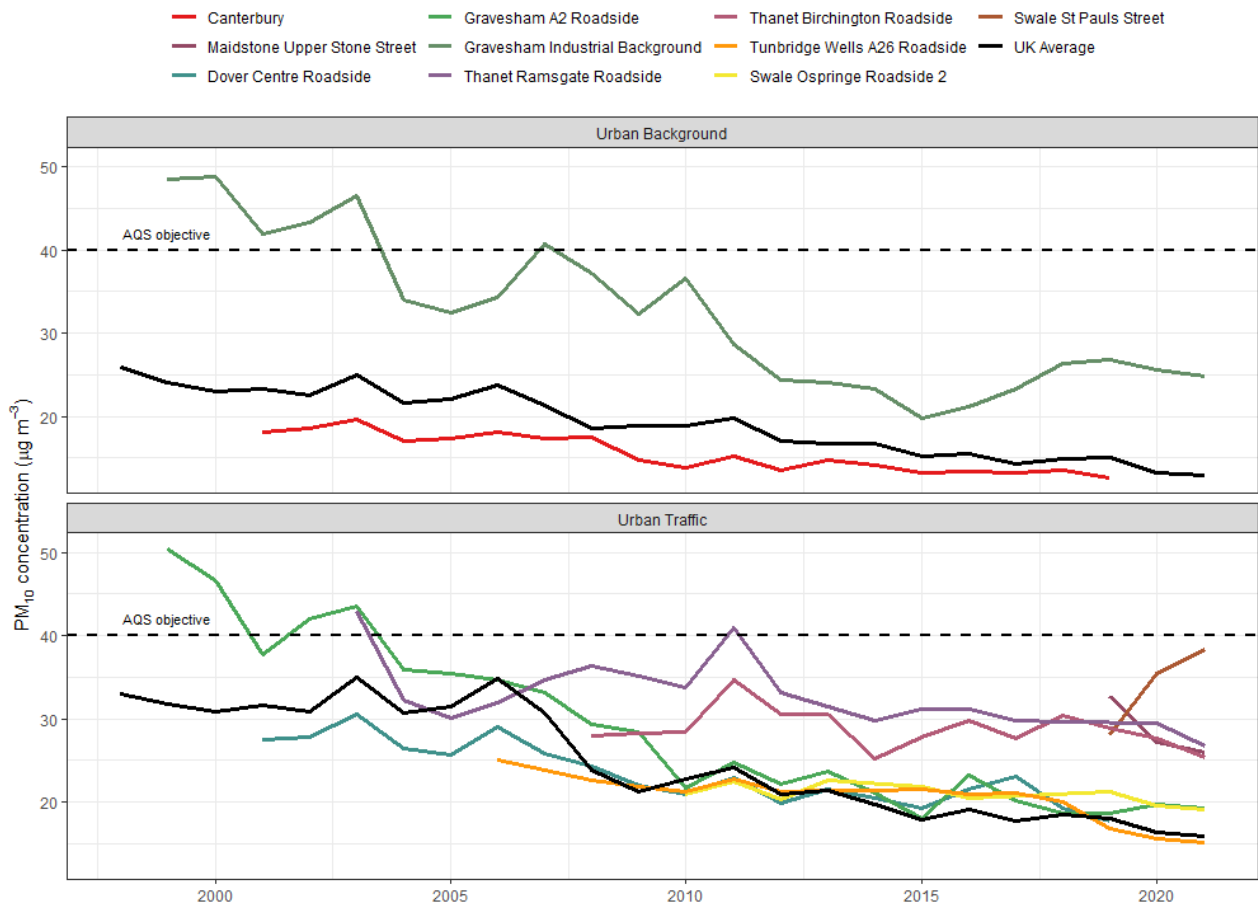


Figure 7: Trends in PM₁₀ annual means concentrations from urban background and traffic monitoring stations in the KMAQMN, alongside the UK average from 1998 to 2021.



PM₁₀ annual mean concentrations at urban background and traffic monitoring stations have decreased since measurements began, following the general downward trend in the AURN UK averages, as shown in Figure 7. Particulate matter has many sources, however, part of the decrease observed may be due to a reduction in emissions from transport and energy sectors. For the traffic stations, the concentrations for Thanet Ramsgate Roadside, Thanet Birchington Roadside, Swale St Pauls Street and Maidstone Upper Stone Street, are much higher than the UK average. As the UK average includes all roadside stations in the UK, some of these may be located in areas which have much lower traffic volumes, and a lighter fleet composition thereby resulting in a lower annual mean concentration.

Figure 8: Trends in PM_{2.5} annual means concentrations from rural and traffic monitoring stations in the KMAQMN, alongside the UK average from 1998 to 2021.

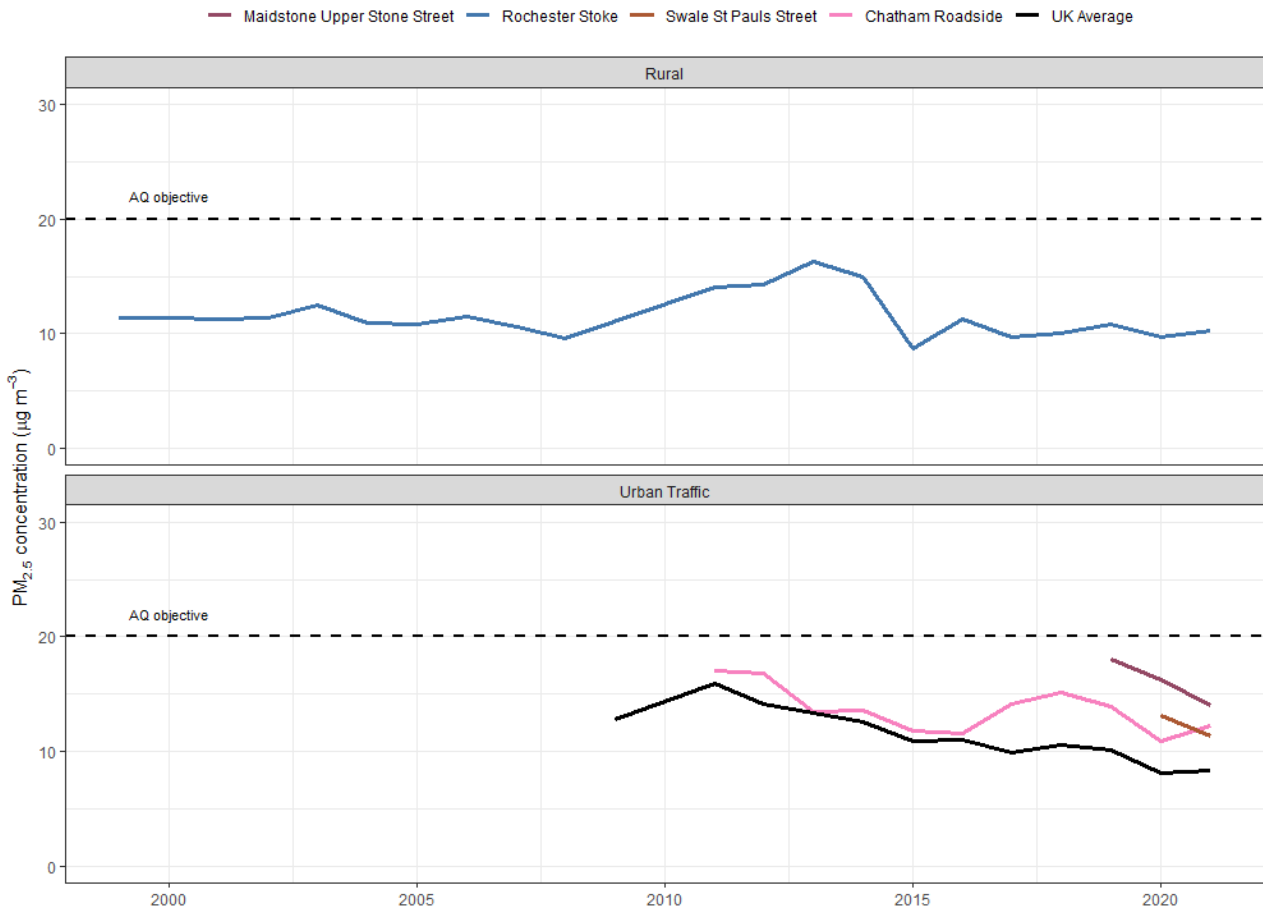
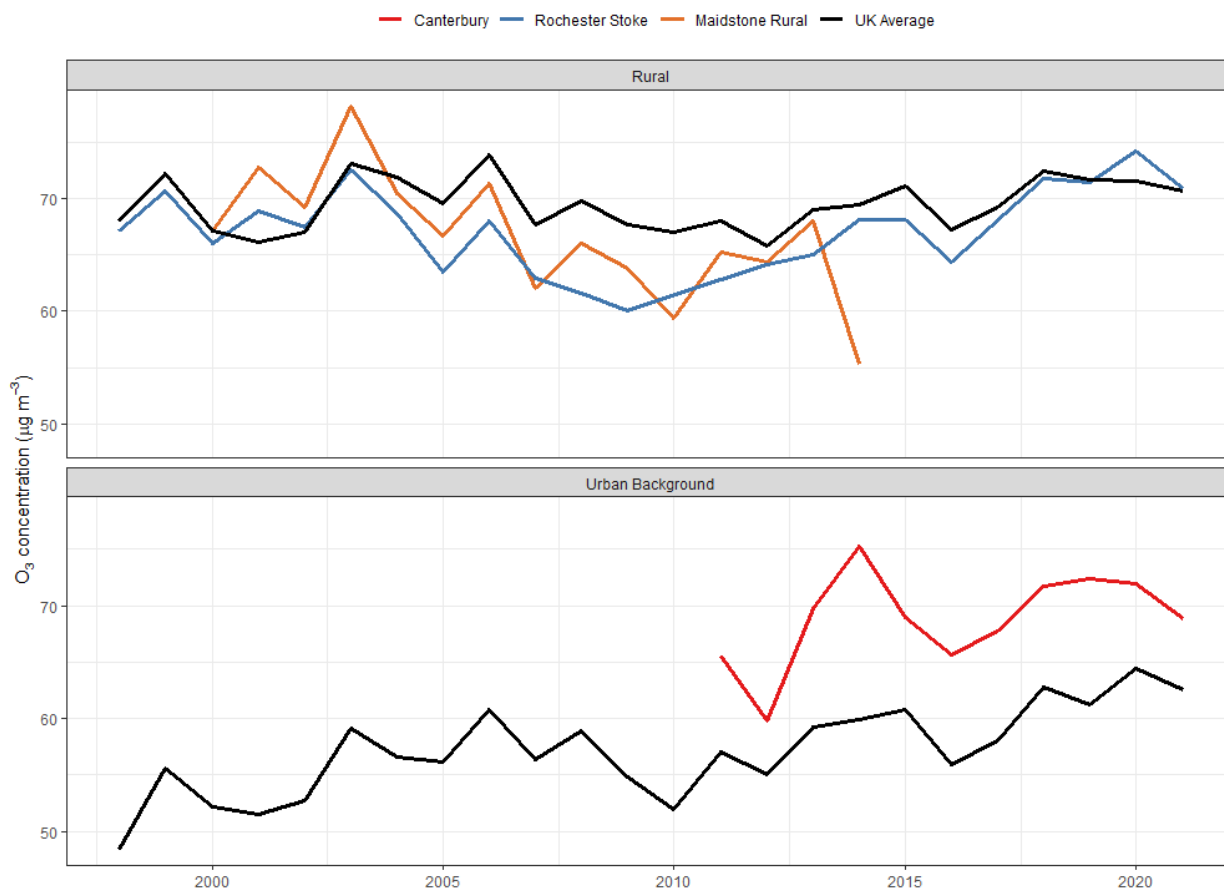


Figure 8 shows long term trends in PM_{2.5} from rural and traffic monitoring stations in the KMAQMN. Note: there are no UK averages available for the rural monitoring sites, therefore a comparison with UK averages is only undertaken for the traffic monitoring sites. Chatham Roadside has been measuring PM_{2.5} since 2011 and followed a similar downward trend to the UK average until 2016, after which annual mean concentrations increased until 2018 followed by another decrease. Annual mean concentrations at the three traffic monitoring sites in the KMAQMN are all higher than the UK average in 2021.

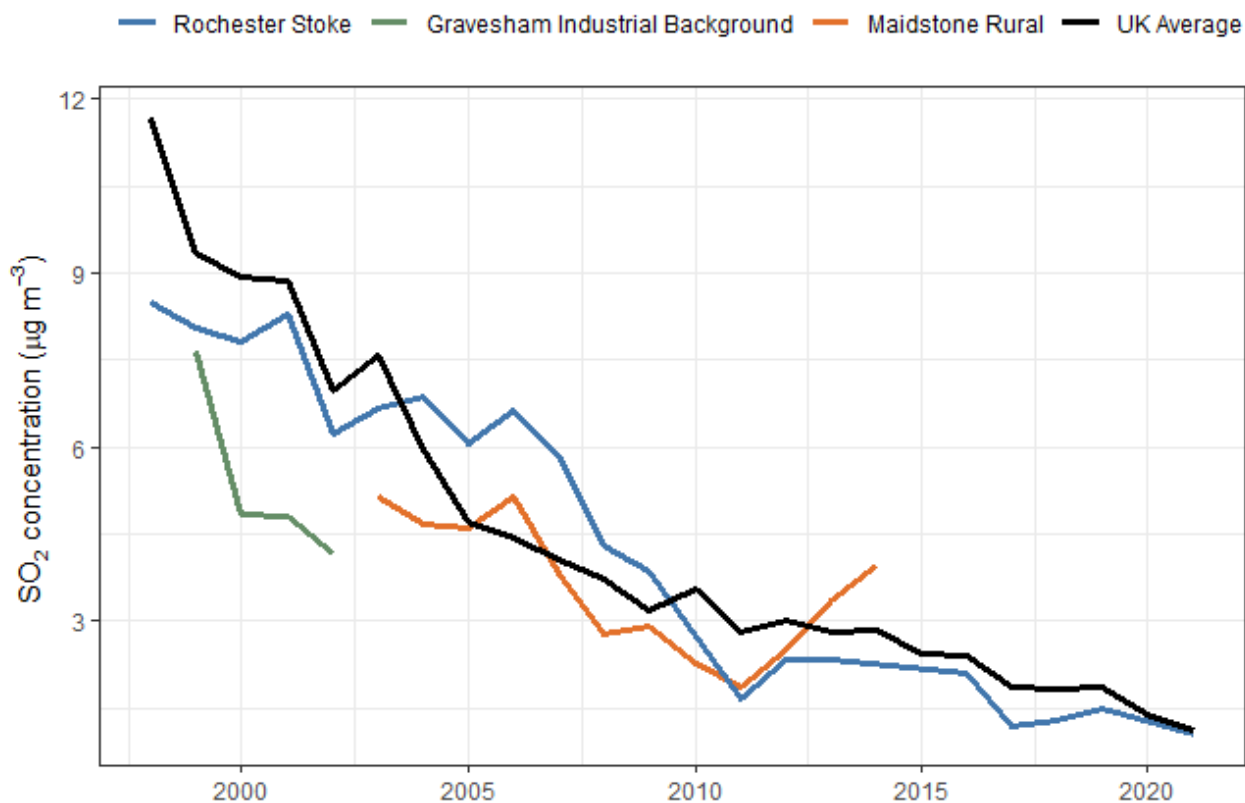
Figure 9: Trends in the annual mean of the daily maximum 8-hour mean O₃ concentrations from rural and urban background monitoring stations in the KMAQMN alongside the UK average from 1998 to 2021.



Ozone trends for rural and urban background monitoring stations are compared to the UK averages in Figure 9. For ozone the annual mean daily maximum running 8-hour mean concentration is compared here, as this provides a better comparison of peak ozone concentrations year on year. Ozone concentrations can vary greatly year on year as the formation of ozone is strongly dependant on meteorological conditions. However, there is some indication that urban background ozone concentrations have increased since around 2010¹⁰, which may be related to the reduction in NO_x as NO reacts rapidly with ozone, thereby a reduction in NO can result in an increase in ozone.

¹⁰ <https://www.gov.uk/government/statistics/air-quality-statistics/concentrations-of-ozone#trends-in-concentrations-of-o3-in-the-uk>

Figure 10: Trends in SO₂ annual means concentrations from the KMAQMN alongside the UK average from 1998 to 2021.



Sulphur dioxide has drastically reduced over the past few decades as a result of limitations put into place on the amount of sulphur in fuels and the reduction in power plants that use coal. The long term trends observed at Rochester Stoke closely follows those of the UK average as shown in Figure 10.

3.6 TEMPORAL VARIATION OF POLLUTANT CONCENTRATIONS

In this section temporal variations of the pollutant concentrations at each site are assessed using the openair R package 'timeVariation' function.

Figure 11 shows the daily, weekly and monthly variations in NO₂ concentrations in 2021, for each of the monitoring stations. The plot shows that the cycles at each site are very similar, although vary in magnitude. Peaks in NO₂ are typically observed in the morning and evening, and the daily concentrations are lowest at the weekend, indicating that road traffic is likely to be a prominent source of NO₂.

The variations in ozone concentrations at the two sites are very similar, as shown in Figure 12. Ozone typically peaks in mid- afternoon, as this is the period when photochemical production of ozone is greatest, and there is also less NO available to react with and remove ozone. Ozone concentrations peak in April at both sites. This spring-time peak in ozone is a regular occurrence in the UK as conditions become conducive to ozone formation.

Figure 11: Daily, weekly and monthly variation in NO₂ concentrations at each monitoring station for 2021.

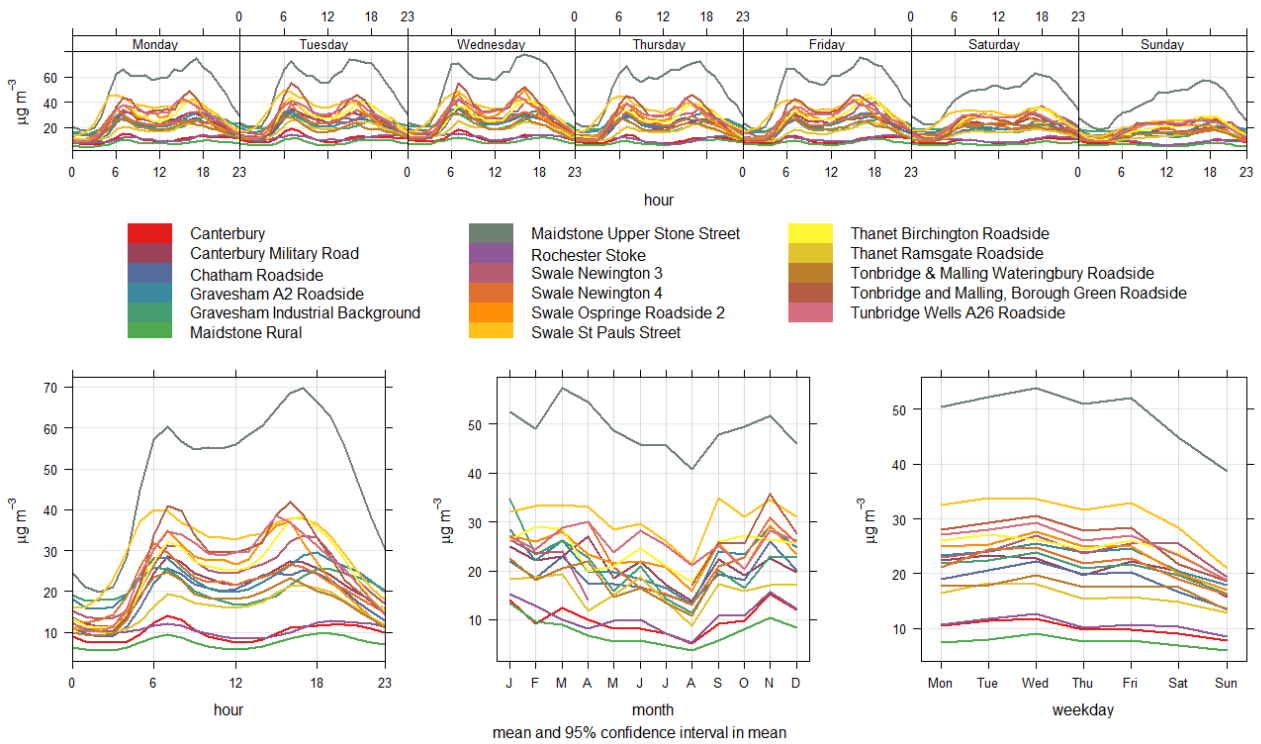
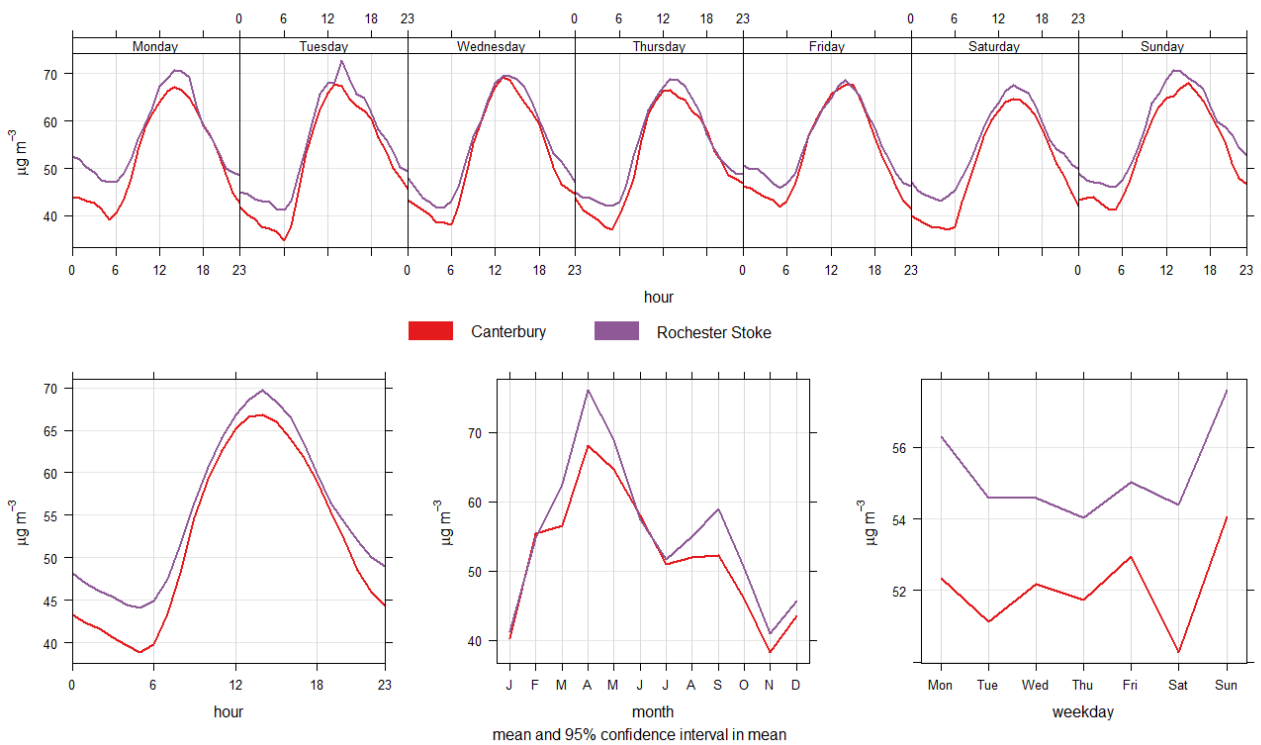


Figure 12: Daily, weekly and monthly variation in O₃ concentrations at each monitoring station for 2021.



The variations in PM₁₀, as shown in Figure 13 vary greatly from site to site. Some sites observe morning and evening peaks in PM₁₀, whilst Swale St Pauls Street has a much higher peak in the morning, which may be due to higher traffic flows at this location, however, this cannot be determined without traffic data and further analysis. PM_{2.5} shows a similar diurnal trend at all sites, with peaks in the morning and late evening (Figure 14).

Figure 13: Daily, weekly and monthly variation in PM₁₀ concentrations at each monitoring station for 2021.

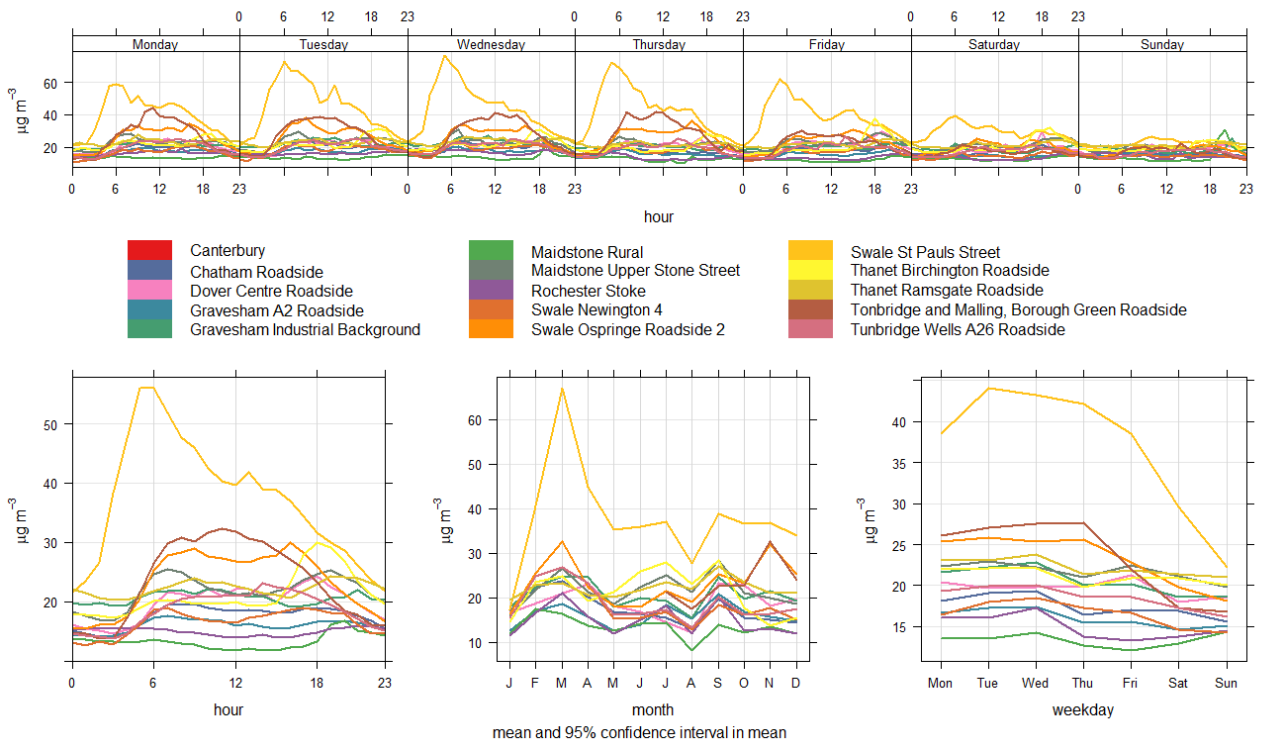
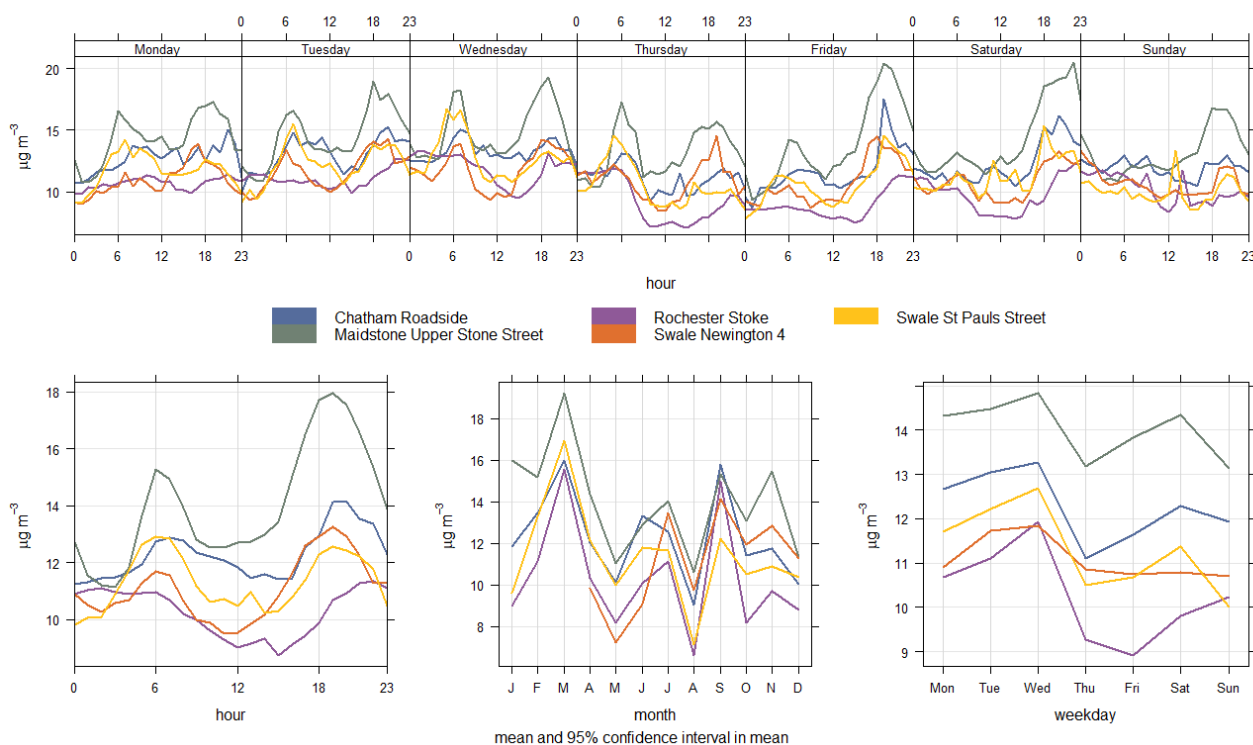


Figure 14: Daily, weekly and monthly variation in PM_{2.5} concentrations at each monitoring station for 2021.



4. DIFFUSION TUBE MONITORING RESULTS

In addition to the automatic monitoring sites, the local authorities within the KMAQMN undertaken indicative measurements of Nitrogen dioxide using diffusion tubes. Diffusion tubes measure NO₂ via passive sampling. A reagent within the tube absorbs ambient NO₂ over a period of days or weeks. The tubes are then collected and analysed in a laboratory to determine the average concentration of NO₂ over the period the tube was exposed. As diffusion tubes are small and require no power, they can be easily attached to street furniture or façades of buildings. A network of these tubes can provide useful information on the spatial variation of NO₂ concentrations.

In this section a summary of the NO₂ diffusion tubes deployed in each local authority are presented for 2021. Table 4-1 shows the total number of sites operating during 2021, by each authority. At some locations, diffusion tubes are exposed in triplicate but are counted as one site here. Results and location information for each local authority's diffusion tube network are available through the KentAir website¹¹.

Table 4-1 NO₂ diffusion tube sites in Kent and Medway in 2021.

Local Authority	Number of Sites	Comments	Analytical Laboratory
Ashford Borough Council	33	-	Socotec (50% TEA in acetone)
Canterbury City Council	56	Four new monitoring sites in 2021. One site relocated, and 21 sites decommissioned.	Socotec (50% TEA in acetone)

¹¹ [NO₂ diffusion tube data - KentAir](#)

Local Authority	Number of Sites	Comments	Analytical Laboratory
Dover District Council	21	Five new monitoring sites in 2021	Socotec (50% TEA in acetone)
Folkstone and Hythe District Council	18	-	Socotec (50% TEA in acetone)
Gravesham Borough Council	66	-	Socotec (50% TEA in acetone)
Maidstone District Council	62	-	Socotec (50% TEA in acetone)
Medway Council	46	Four new monitoring sites in 2021	Socotec (50% TEA in acetone)
Swale District Council	78	Four sites closed in 2021	Socotec (50% TEA in acetone)
Thanet District Council	39	-	Socotec (50% TEA in acetone)
Tonbridge and Malling Borough Council	56	-	Socotec (50% TEA in acetone)
Tunbridge Wells Borough Council	42	13 new monitoring sites in 2021	Socotec (50% TEA in acetone)

4.1.1 Site classifications

NO₂ diffusion tubes sites are classified according to the site classifications stated in the Local Air Quality Management Technical Guidance LAQM (TG22)¹²

Table 4-2 Site classifications used for NO₂ diffusion tube sites

Urban centre	An urban location representative of typical population exposure in towns or city centres, for example, pedestrian precincts and shopping areas
Urban background	An urban location distanced from sources and therefore broadly representative of citywide background conditions, e.g. urban residential areas
Suburban	A location type situated in a residential area on the outskirts of a town or city
Roadside	A site sampling typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases)
Kerbside	A site sampling within one metre of the kerb of a busy road
Industrial	An area where industrial sources make an important contribution to the total pollution burden
Rural	An open countryside location, in an area of low population
Other	Any special source-orientated or location category covering monitoring undertaken in relation to specific emission sources such as power stations, car-parks, airports or tunnels

¹² <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

The majority of the NO₂ diffusion tube sites within the KMAQMN are classified as either kerbside or roadside, with a few urban background, suburban rural and industrial sites. It is not always the case that kerbside sites measure higher NO₂ concentrations than roadside sites, despite being located closer to the road edge, as it also depends on the volume of traffic on the road. Therefore, kerbside and roadside sites are considered together in this report under one category, “Urban Traffic”.

4.1.2 Bias adjustment, annualisation and fall-off with distance

NO₂ diffusion tubes provide a low-cost method of measuring ambient NO₂, however the method is not as precise or accurate as automatic NO₂ monitoring techniques, hence they can only be used for “indicative” measurements of NO₂. Diffusion tubes can also be affected by interferences which can result in positive or negative biases, when compared to automatic monitoring techniques. As such annual mean concentrations derived from the monthly NO₂ diffusion tube samples require to be “bias-corrected”.

Local bias correction factors may be determined by locating triplicate tubes next to an automatic analyser and calculating the ratio of the annual means from both methods. The calculated bias correction factor can then be used to correct the diffusion tube data for the local authority. If a local authority does not have an automatic monitoring station, national bias adjustment factors¹³ may be used. National bias adjustment factors are based on co-location studies from many sites in the UK. A factor is calculated for each analysing laboratory, preparation method and year.

If a diffusion tube has between 3 and 8 months of data, then the data needs to be annualised to calculate the annual mean. Diffusion tubes with less than 3 months of data cannot be annualised. Annualisation is performed by comparing the data from diffusion tubes to nearby automatic monitoring stations. Further information on annualisation of diffusion tubes is provided in the Local Air Quality Management Technical Guidance LAQM (TG22).

Diffusion tubes are typically placed at locations of relevant exposure. However, this is not always possible, therefore, local authorities can use the NO₂ fall-off with distance calculator¹⁴ to predict the annual mean concentration of NO₂ at the nearest relevant receptor.

4.1.3 Final annual means and comparison with AQ objectives for each LA

In this section bias-adjusted and annualised (where relevant) diffusion tube NO₂ annual mean concentrations for each local authority are shown, along with the AQS objective of 40 µgm⁻³. The data is taken directly from each local authority’s published annual status report located on the KentAir website here: <https://kentair.org.uk/reports>.

As diffusion tubes with less than 3 months of data cannot be annualised, the annual means for these tubes are not shown here. Sites with triplicate tubes are given by an asterisk (*), and a single value for the site shown. Please note that NO₂ concentrations presented in Figure 15 to Figure 25 are not corrected for fall-off with distance (where relevant) and represent the concentrations measured at the tube location, rather than the nearest relevant receptor.

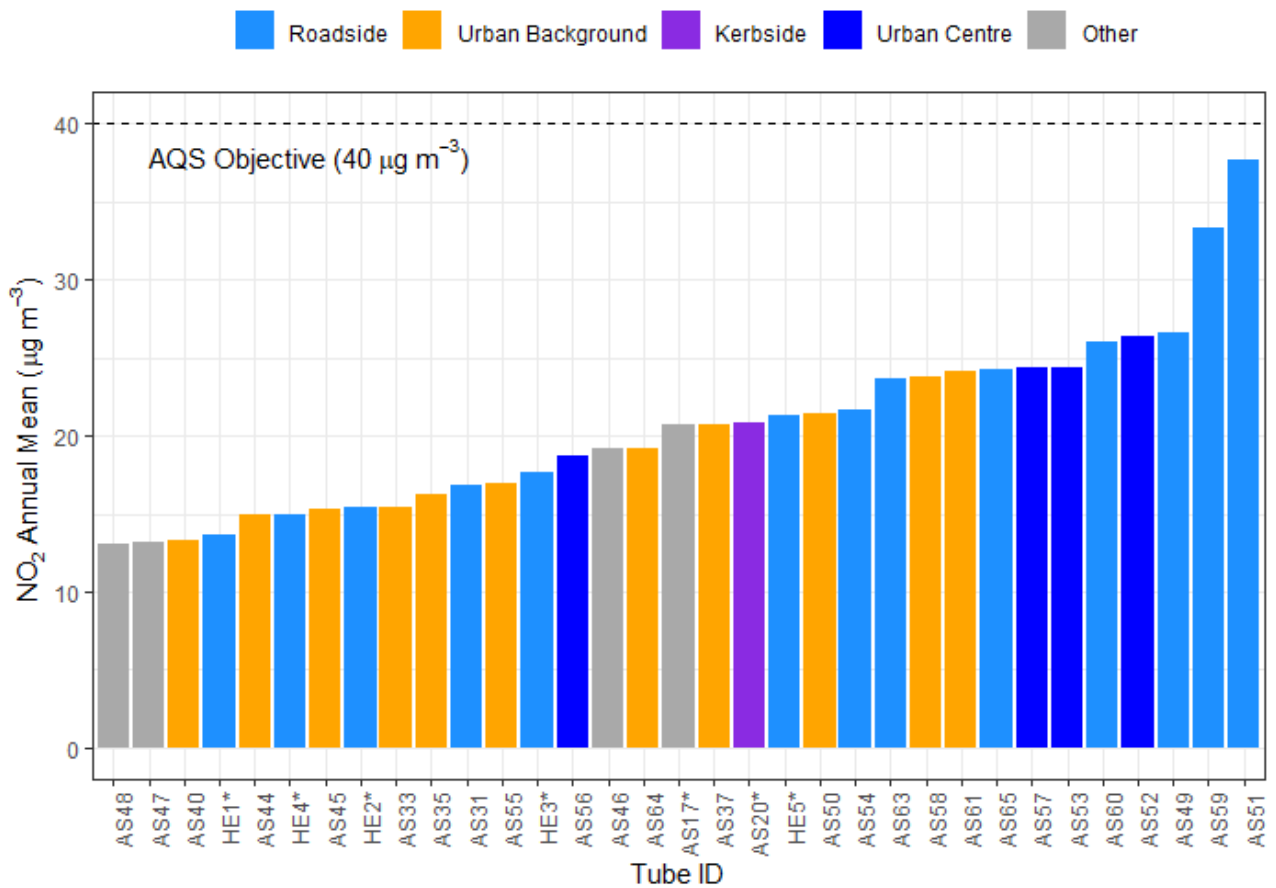
¹³ <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/>

¹⁴ <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-falloff/>

4.1.3.1 Ashford Borough Council

In Ashford Borough NO₂ annual mean concentrations were measured at 33 diffusion tube sites in 2021. Of these, 13 sites were classified as Roadside, 11 as Urban Background, 4 as Urban Centre and 4 as Other (Other are located near motorways). Annual mean concentrations at all sites were below the AQS objective in 2021. An annual mean NO₂ concentration of 37.7 µg m⁻³ was recorded at the site on Wellesley Road (AS51), which is within 10% of the AQS objective.

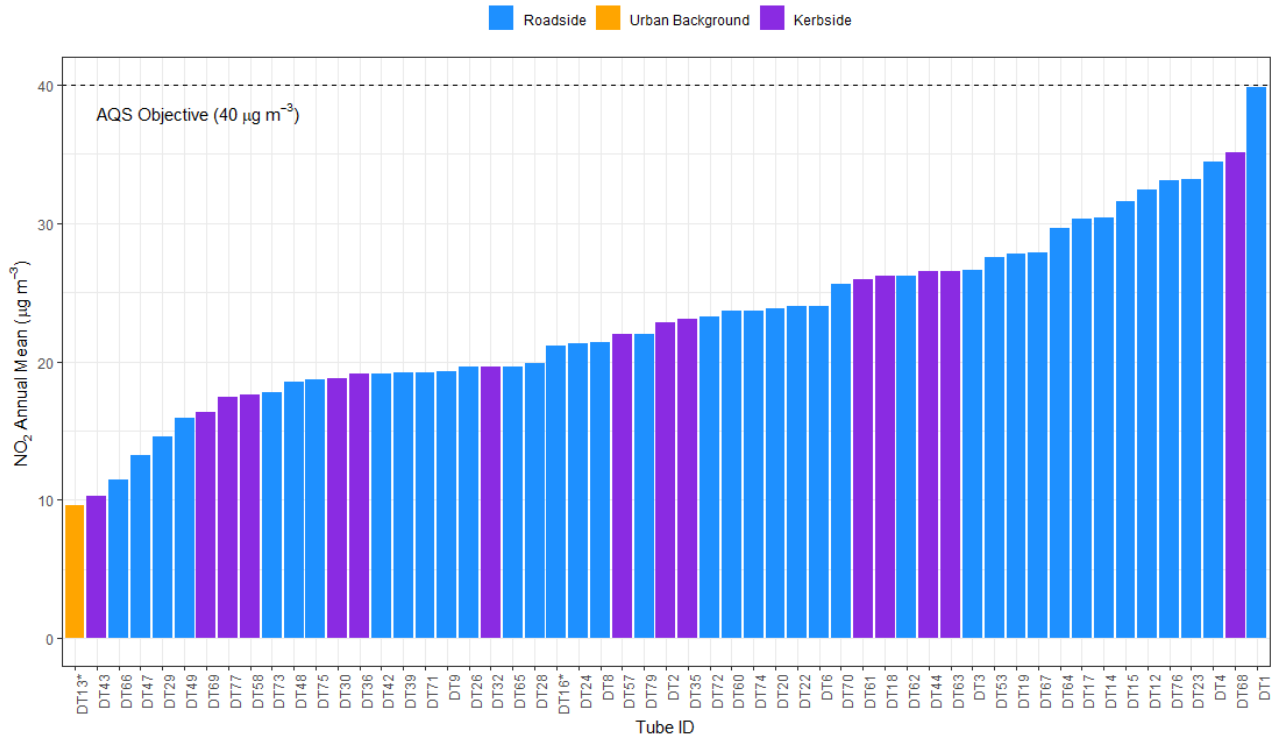
Figure 15 Ashford Borough Council diffusion tube NO₂ annual means for 2021



4.1.3.2 Canterbury City Council

In Canterbury NO₂ annual mean concentrations were measured at 55 diffusion tube sites in 2021. Of these, 15 sites are classified as Kerbside, 39 as Roadside, and 1 as Urban Background. Annual mean concentrations at all sites were below the AQS objective in 2021. One site located on Broad Street (DT1) recorded an annual mean NO₂ concentration of 37.7 µg m⁻³ in 2021, which is within 10% of the AQS objective.

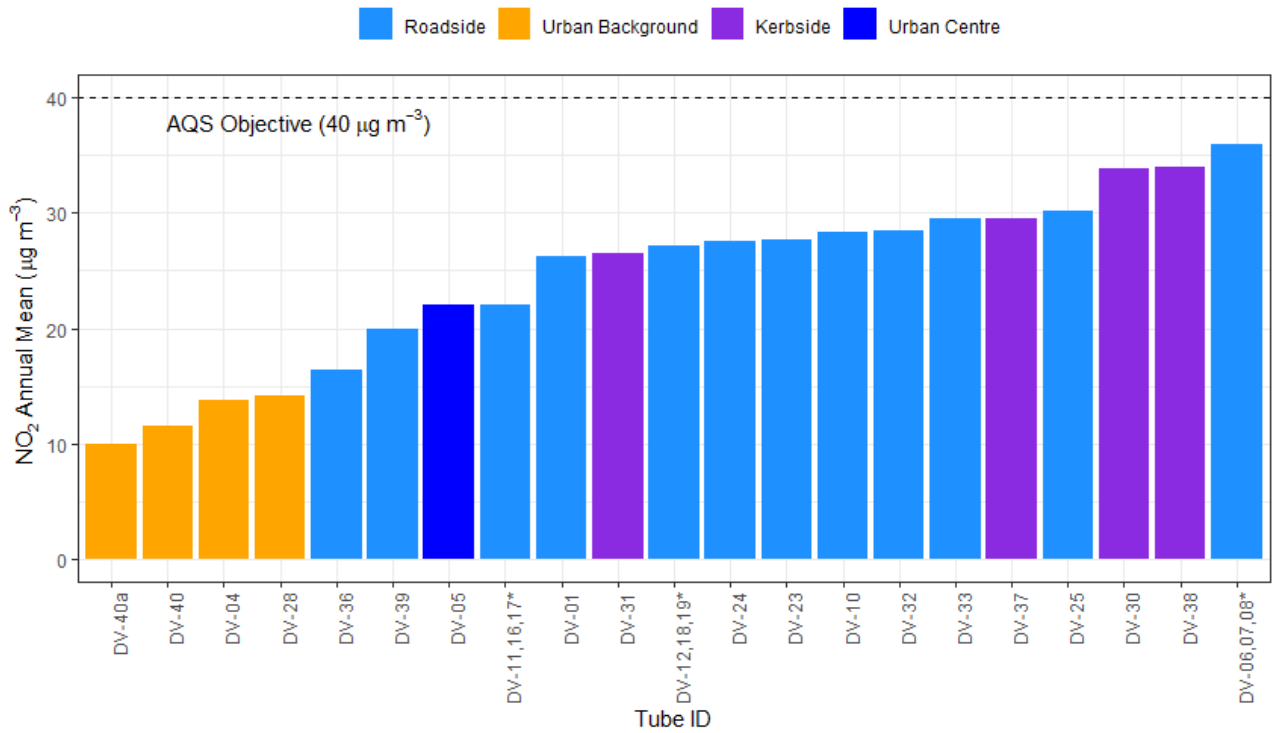
Figure 16 Canterbury City Council diffusion tube NO₂ annual means for 2021



4.1.3.3 Dover District Council

In Dover NO₂ annual mean concentrations were measured at 21 diffusion tube sites in 2021. Of these, 4 sites are classified as Kerbside, 12 as Roadside, 1 as Urban Centre, and 4 as Urban Background. Annual mean concentrations at all sites were below the AQS objective in 2021 and no sites were within 10% of the AQS objective. The highest annual mean NO₂ concentration recorded was 35.9 µg/m³ at the triplicate site Town Hall 1, which is located in an AQMA.

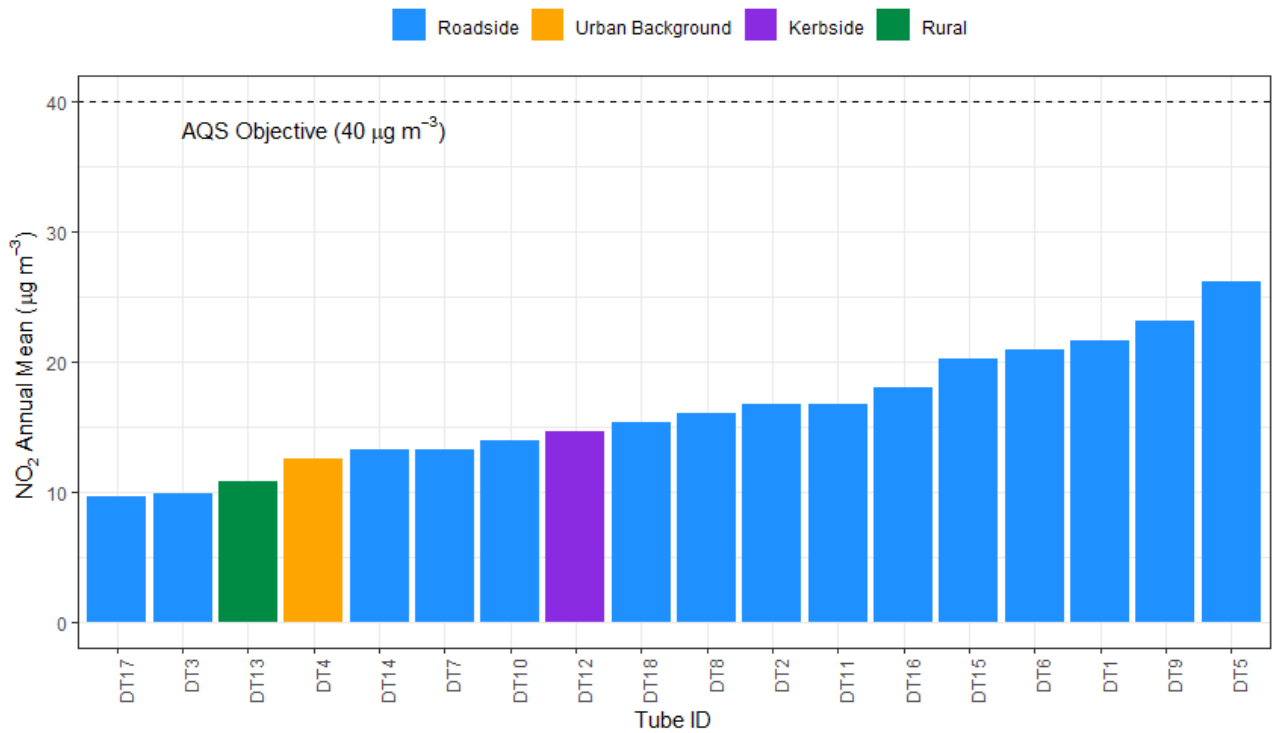
Figure 17 Dover District Council diffusion tube NO₂ annual means for 2021



4.1.3.4 Folkstone and Hythe District Council

In Folkstone and Hythe NO₂ annual mean concentrations were measured at 18 diffusion tube sites in 2021. Of these, 1 site is classified as Kerbside, 15 as Roadside, 1 as Urban Background, and 1 as Rural. Annual mean concentrations at all sites were below the AQS objective in 2021. Annual mean NO₂ concentrations at all sites were below the AQS objective in 2021.

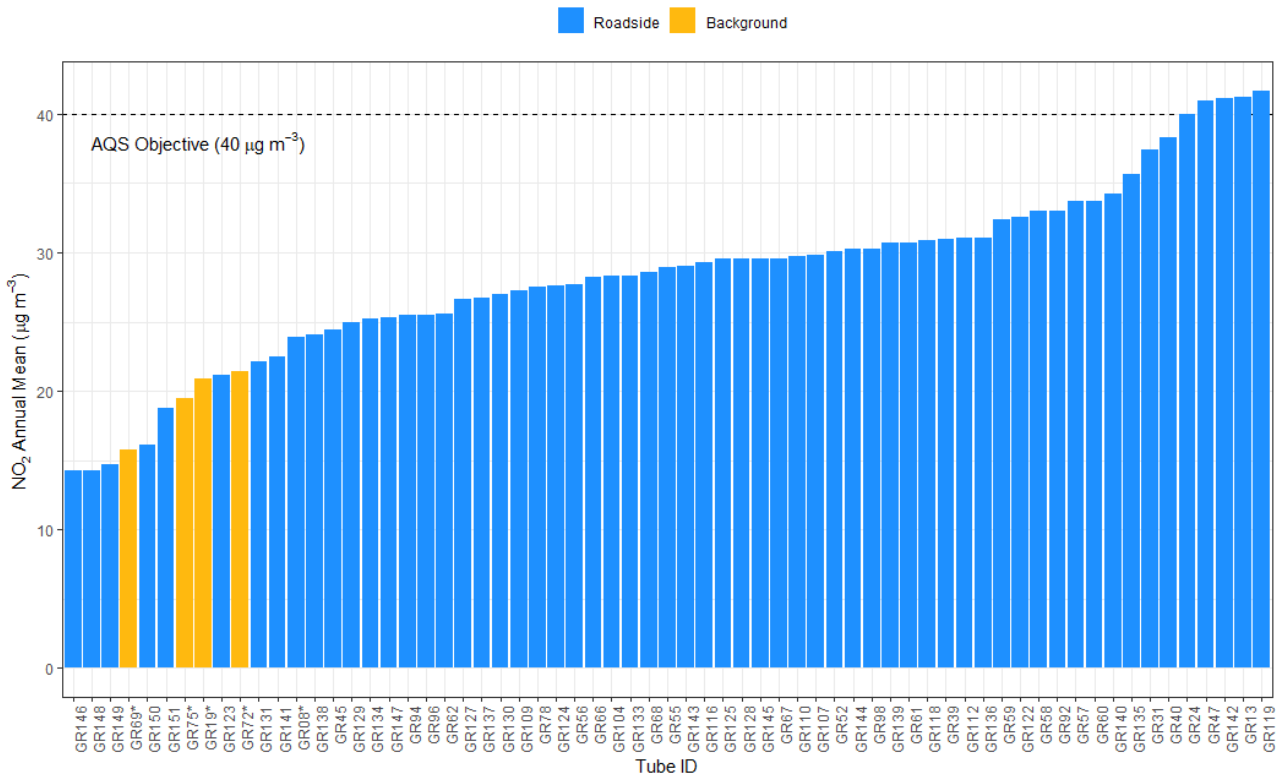
Figure 18 Folkstone and Hythe District Council diffusion tube NO₂ annual means for 2021



4.1.3.5 Gravesham Borough Council

In Gravesham NO₂ annual mean concentrations were measured at 65 diffusion tube sites in 2021. Of these, 61 sites are classified as Roadside, and 4 as Background. Five sites (GR24, GR47, GR142, GR13 and GR119) recorded annual mean NO₂ concentrations above the AQS objective in 2021.

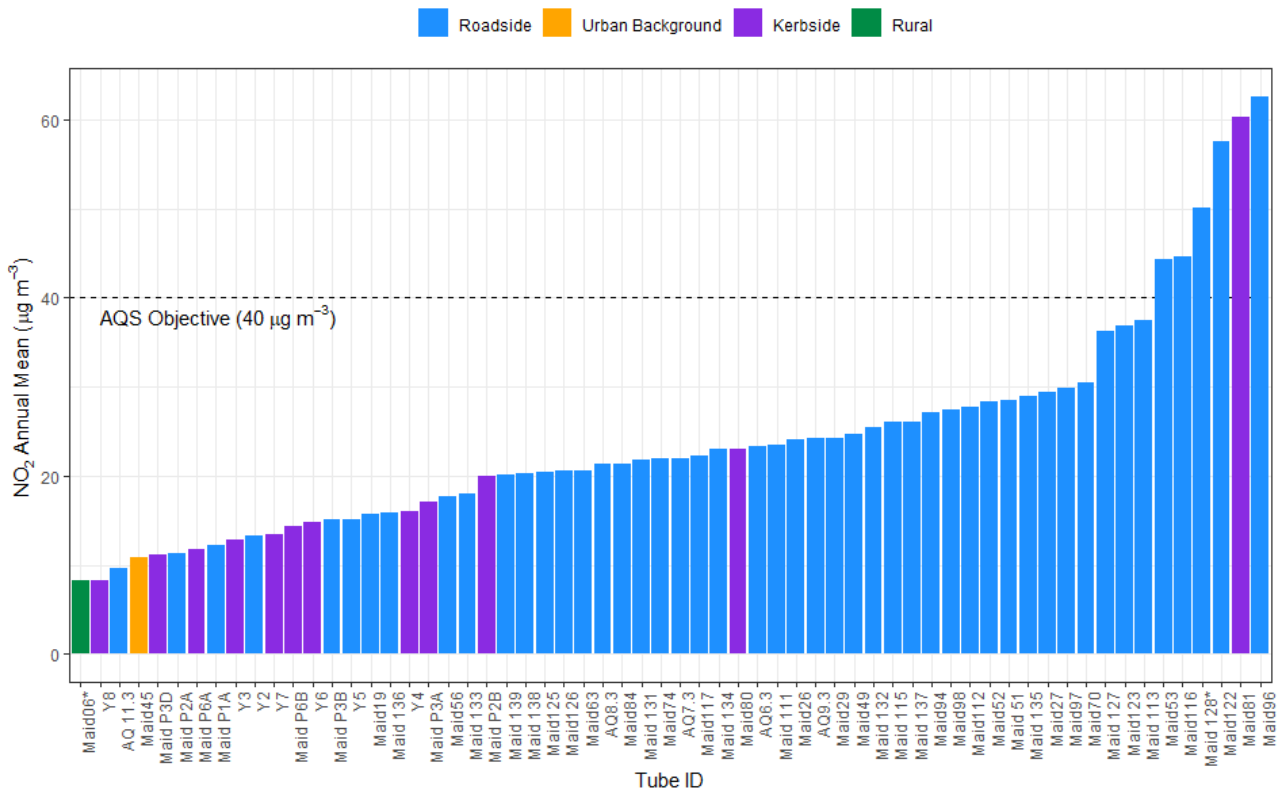
Figure 19 Gravesham Borough Council diffusion tube NO₂ annual means for 2021



4.1.3.6 Maidstone Borough Council

In Maidstone NO₂ annual mean concentrations were measured at 62 diffusion tube sites in 2021. Of these, 12 sites are classified as Kerbside, 48 as Roadside, and 1 as Background and 1 as Rural. Six sites (Maid 53, Maid 116, Maid 128, Maid 112, Maid 81 and Maid 96) recorded annual mean NO₂ concentrations above the AQS objective in 2021.

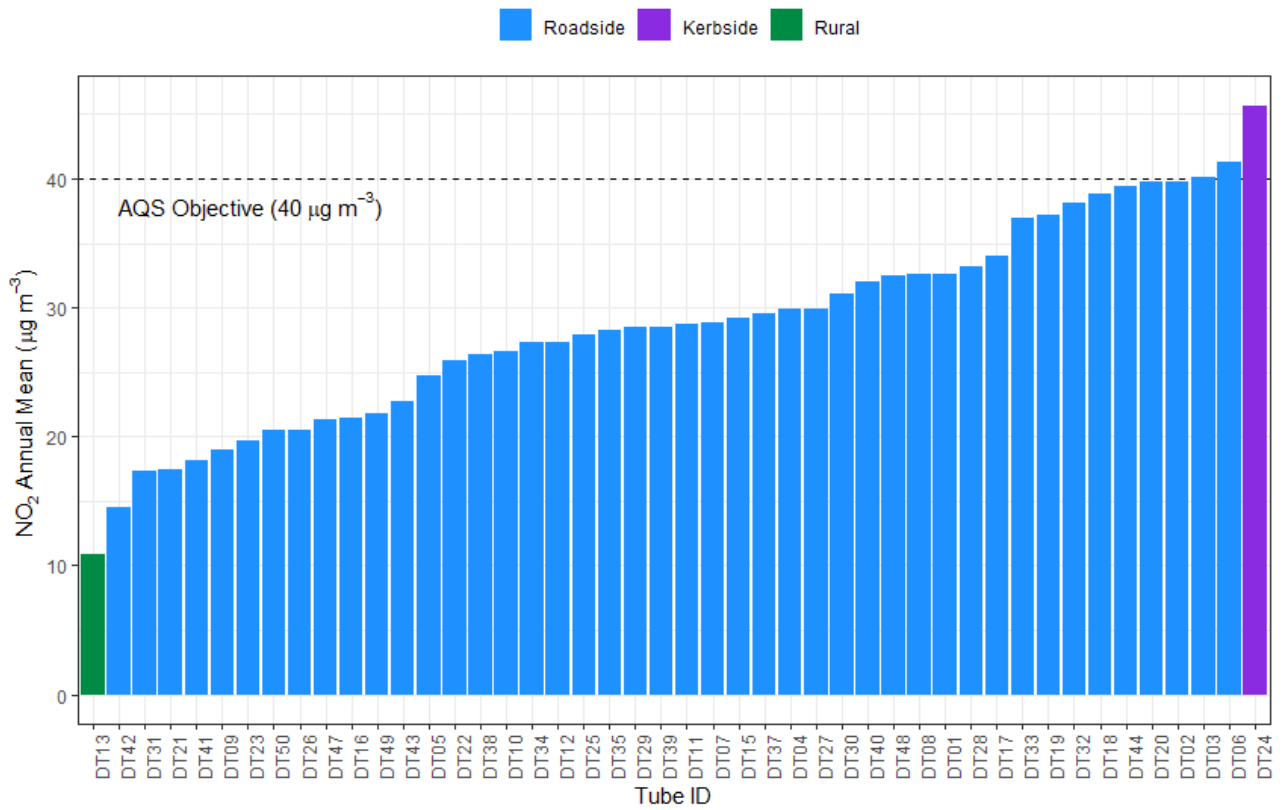
Figure 20 Maidstone District Council diffusion tube NO₂ annual means for 2021



4.1.3.7 Medway Council

NO₂ annual mean concentrations were measured at 46 diffusion tube sites in 2021 by Medway Council. Of these, 44 sites are classified as Roadside, 1 as Kerbside and 1 as Rural. Three sites (DT03, DT06 and DT24) recorded annual mean NO₂ concentrations above the AQS objective in 2021. These 3 sites are all within currently declared AQMAs.

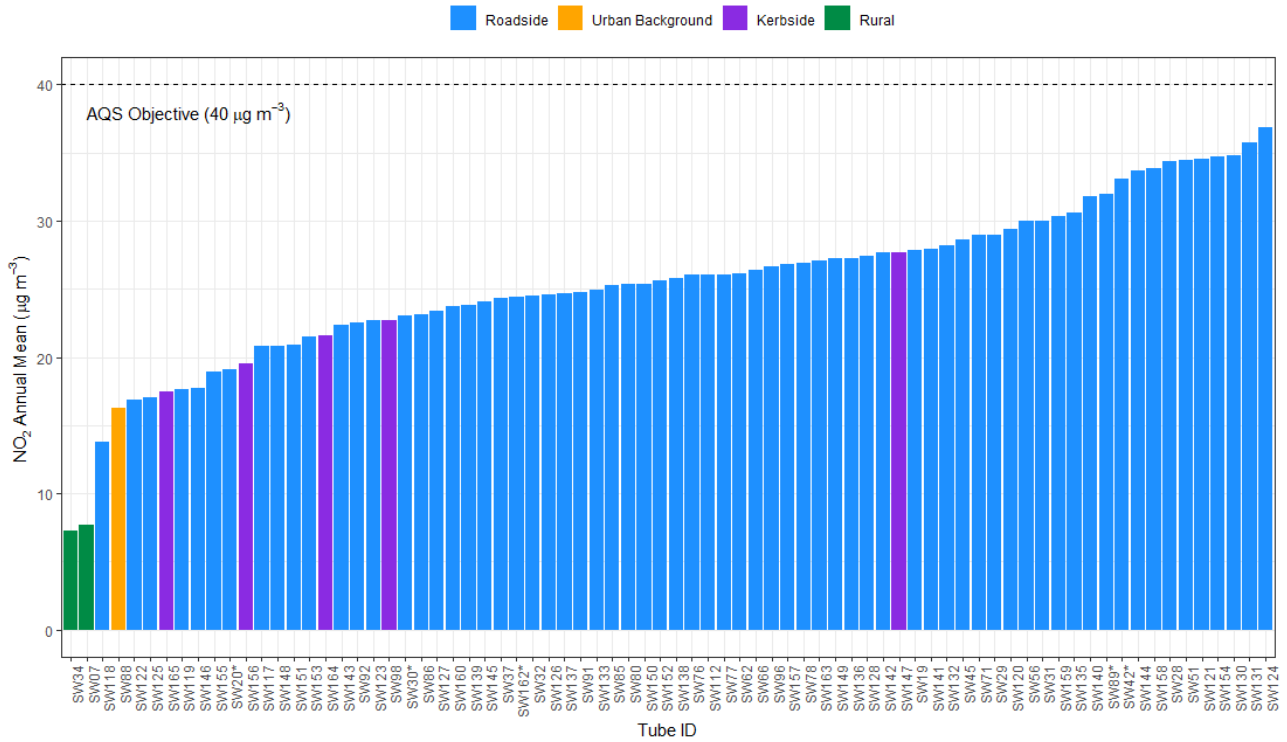
Figure 21 Medway Council diffusion tube NO₂ annual means for 2021



4.1.3.8 Swale Borough Council

In Swale NO₂ annual mean concentrations were measured at 76 diffusion tube sites in 2021. Of these, 5 sites are classified as Kerbside, 68 as Roadside, 1 as Urban Background and 2 as Rural. Annual mean concentrations at all sites were below the AQS objective in 2021. One site, located on Keycol Hill (SW124), recorded an annual mean NO₂ concentration of 36.9 µg m⁻³ in 2021, which is within 10% of the AQS objective.

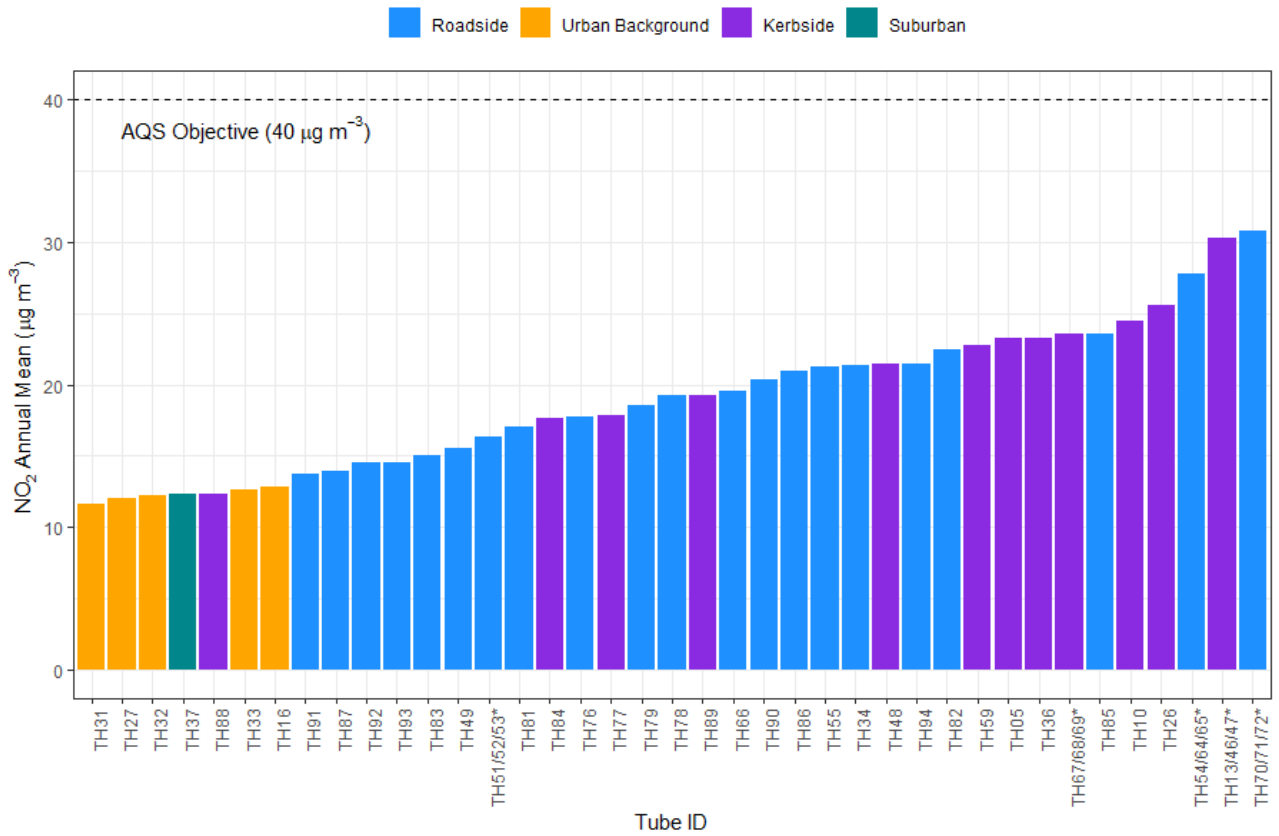
Figure 22 Swale District Council diffusion tube NO₂ annual means for 2021



4.1.3.9 Thanet District Council

In Thanet NO₂ annual mean concentrations were measured at 39 diffusion tube sites in 2021. Of these, 12 sites are classified as Kerbside, 21 as Roadside, 5 as Urban Background and 1 as Suburban. Annual mean concentrations at all sites were below the AQS objective in 2021.

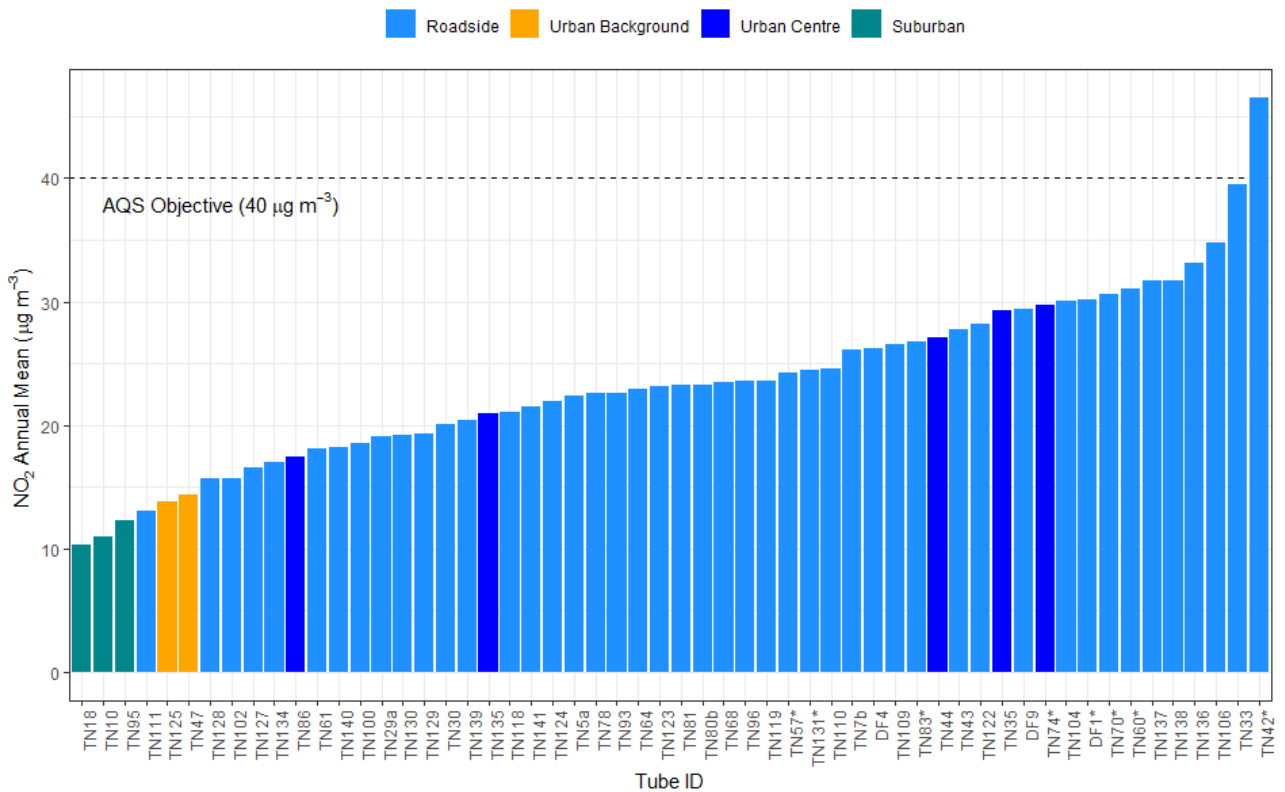
Figure 23 Thanet District Council diffusion tube NO₂ annual means for 2021



4.1.3.10 Tonbridge and Malling Borough Council

In Tonbridge and Malling NO₂ annual mean concentrations were measured at 56 diffusion tube sites in 2021. Of these, 46 sites are classified as Roadside, 5 as urban Centre, 2 as Urban Background and 3 as Suburban. A triplicate site located on Tonbridge Road, Waterringbury (TN42, TN76, TN77) recorded an annual mean NO₂ concentration of 46.5 µg m⁻³ in 2021, which is above the AQS objective of 40 µg m⁻³. A site (TN33), further along the same road recorded an annual mean NO₂ concentration of 39.5 µg m⁻³ in 2021, which is within 10% of the AQS objective.

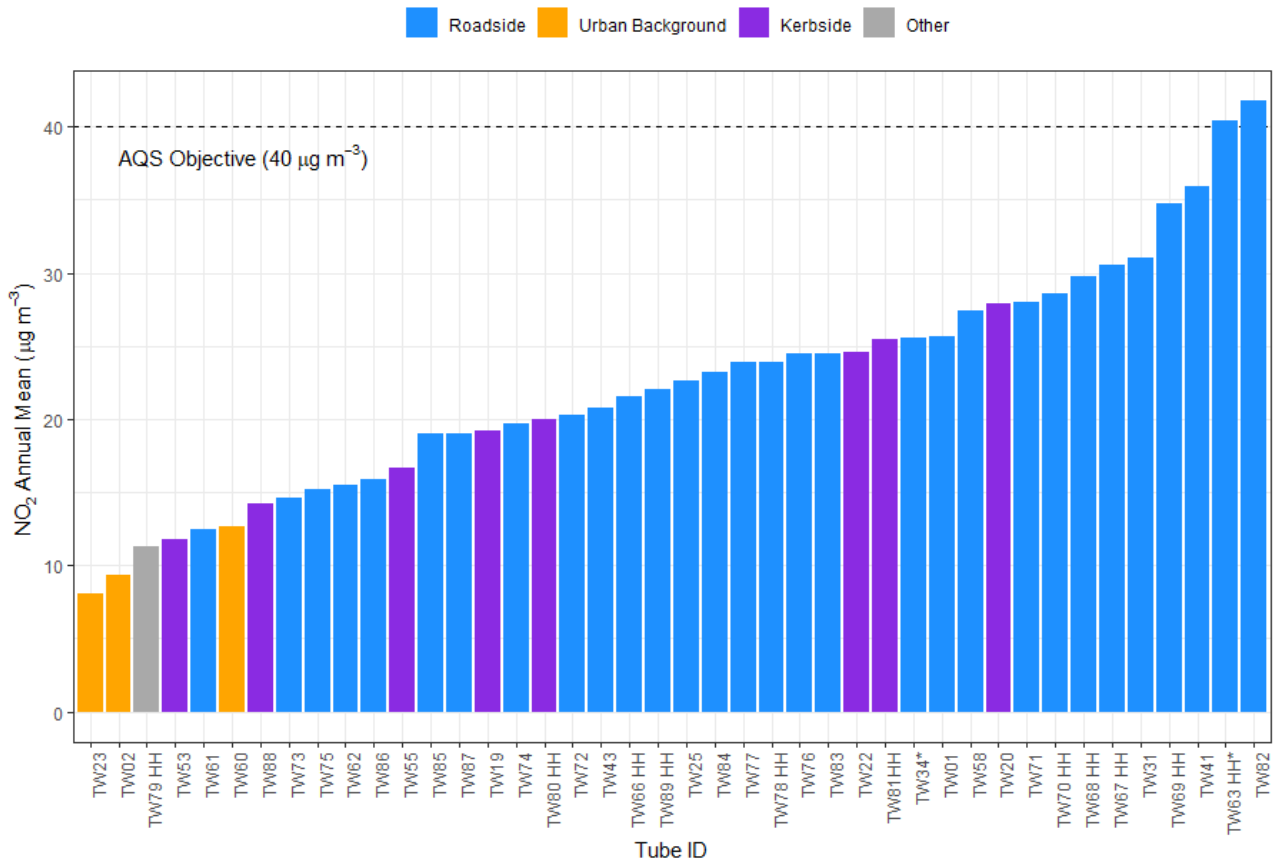
Figure 24 Tonbridge and Malling Borough Council diffusion tube NO₂ annual means for 2021



4.1.3.11 Tunbridge Wells Borough Council

In Thanet NO₂ annual mean concentrations were measured at 42 diffusion tube sites in 2021. Of these, 8 sites are classified as Kerbside, 30 as Roadside, 3 as Urban Background and 1 as Other. Two sites recorded annual mean NO₂ concentrations above the AQS objective of 40 µg m⁻³. These are TW63 HH, a triplicate site on Cranbrook Road, and TW82 on Pembury Road.

Figure 25 Tunbridge Wells Borough Council diffusion tube NO₂ annual means for 2021



5. LOCAL AUTHORITY ACTIONS TO IMPROVE AIR QUALITY

In this section a summary of the air quality actions in progress or planned for the future are provided for each borough/district. Further details on local authority actions can be found in the individual Annual Status Reports (ASRs) published on the KentAir website here: <https://kentair.org.uk/reports>.

Ashford Borough Council

Ashford Borough Council undertook passive NO₂ monitoring at 33 diffusion tube sites in 2021. There are no automatic monitoring sites in the Borough. One diffusion tube site recorded an annual mean NO₂ concentration within 10% AQS objective. All other sites were below the objective. As such there are no AQMAs declared in the Borough.

Ashford Borough Council have been working to improve air quality, including:

- Implementation of electric vehicle charging points. The total energy consumption recorded within the Ashford EV charging points network in 2021 was 24,633 kWh.
- Contribution to the Kent Air and Care for Air websites to provide communications campaign and education resource about air quality.
- The major developments to be built or in operation are all in line with guidance from the Institute of Air Quality Management.
- The KM Charity Walk to School scheme which runs green travel initiatives for schools continues to be supported.
- A 3 year scheme to encourage electric and hybrid taxis is now completed and has been extended to March 2025.
- The cross service health and wellbeing group has been established.
- The 'Rolvenden Rocket' community bus service pilot has concluded.

For 2022 priorities will include:

- Raise awareness of climate change and air quality to increase understanding and knowledge.
- Ensure the council's decision making processes, strategic documents and procedures contribute to reducing carbon emissions, improving air quality and increasing local resilience to climate change.
- Encourage and enable a shift towards cleaner modes of transport and reduce car dependency.
- Protect, enhance and increase green space for the benefit of people and wildlife.

Canterbury City Council

Canterbury City Council monitored NO₂ at two automatic monitoring sites and 56 diffusion tubes sites in 2021. There are currently two AQMAs declared for NO₂ in the district.

An Air Quality Action Plan 2018-2023 was produced in December 2018. In 2021 the council have completed the following actions:

- Implementation of the first phase of an anti-idling education campaign followed by adoption of district-wide anti-idling enforcement powers, with the second phase on-going;
- Introduction of an electric scooter pilot in Canterbury;
- Exploration of the feasibility of introducing a low emission zone in Canterbury City Centre; and
- A review of Park and Ride bus contract to include consideration of air quality issues - low emission buses, routes to train stations etc.

For 2022, the following measures are expected to be implemented:

- To support the improvement in broadband infrastructure across the district enabling more home working and reducing vehicle movement into Canterbury.

- To explore opportunities to enhance the sustainable transport hub at Canterbury West station.
- To review Taxi / Private Hire Vehicle Policy licence fees and promote low emission vehicles by ranking.

Dover District Council

In the district of Dover, activities relating to the Port (such as shipping and road transport) are the main source of pollutants. The District current has two AQMAs declared for NO₂. Dispersion modelling undertaken in 2021 concluded that the boundaries of the AQMAs should remain the same.

Five new NO₂ diffusion tube monitoring sites were added in 2021, bringing the total number to 21 sites. Measured annual mean concentrations at all sites were below the AQS objective. In addition an automatic site monitors PM₁₀ concentrations in Dover Centre.

Dover District Council are currently drafting an updated Air Quality Action Plan (AQAP) which will include measures to improve air quality in Dover. The updated plan is due for publication by the end of 2022.

In addition, Dover District Council are preparing a new Local Plan which will include an assessment of how future developments will impact air quality within the area, in particular within sensitive areas (e.g. AQMAs or the internationally designated sites).

Folkstone and Hythe District Council

NO₂ monitoring was undertaken at 18 diffusion tube sites in Folkstone and Hythe in 2021. Annual mean concentrations at all sites were below the AQS objective. There are no declared AQMAs in Folkstone and Hythe.

Folkstone and Hythe District Council have a number of key priorities to ensure AQS objectives continue to be met:

- Constantly review the current monitoring programme, explore the need to deploy new monitoring locations in areas where monitoring has not previously been undertaken and where it is believed that there may be elevated concentrations of NO₂ in areas of relevant public exposure;
- Actively engage with large residential developers to consider installing electric vehicle charging points or alternatively, provide passive provisions for future installations;
- To work in conjunction with the County Council to investigate the scope for the introduction of traffic management initiatives where appropriate, including lorry management and traffic speed control;
- Provide an integrated transport network to facilitate the efficient movement of pedestrian and vehicular traffic, goods, and services within the District;
- Continue to improve accessibility to key services and facilities and to direct development to sustainable locations in order to achieve sustainable development;
- Continue to limit the quantity of traffic on the District's roads by actively encouraging effective public transport, cycling, and walking and by the careful integration of residential areas, shopping and recreational facilities and the workplace; and
- Continue to be an active member of the Kent and Medway Air Quality Partnership.

Gravesham Borough Council

Gravesham Borough Council monitor NO₂ and PM₁₀ at two automatic monitoring sites and NO₂ at 66 diffusion tube sites. Both NO₂ and PM₁₀ were in compliance with AQS objectives in 2021. Five sites of the diffusion tube sites recorded annual mean NO₂ concentrations above the AQS objective in 2021. There are currently four AQMAs declared in the Borough, two of the AQMAs are for NO₂ only, one is for PM₁₀ only and another for NO₂ and PM₁₀ combined.

The declaration of the existing AQMAs and the adoption of Action Plans and Strategies continue to enable the Council to make progress on improving air quality within the Borough, for residents and visitors. This has been achieved by working with partners, including Kent County Council, Kent County Highways, National Highways Agency, and the Environment Agency.

Whilst there has been significant progress with the measures in the existing action plans, leading to the revocation of three of the seven AQMAs in the borough, major additional work that has been undertaken to assess air quality includes:

- The development of a new AQAP that incorporates all AQMAs into one AQAP; and
- The implementation of the Climate Change Management Plan (CCMP)

For 2022 the Council's main aims are:

- To complete and implement the new AQAP
- To implement and continue to progress the Climate Change Management Plan 2022
- Continue working with partners in the Kent and Medway Air Quality Partnership (K&MAQP) to improve air quality throughout the area; and
- Continue reviewing the NO₂ passive monitoring network, in order to identify any areas which may require additional monitoring and to identify any potential areas of exceedances.

Maidstone Borough Council

In 2021 Maidstone Borough Council undertook NO₂ and PM₁₀ monitoring at two automatic sites. One of the automatic sites also monitored PM_{2.5}. There were also 62 diffusion tube sites for monitoring NO₂. The automatic site at Maidstone Upper Stone Street, exceeded the annual mean limit value of 40 µgm⁻³ for NO₂ in 2021. Six of the diffusion tube sites also recorded annual mean NO₂ concentrations above the AQS objective in 2021. There were no exceedances of the PM₁₀ or the PM_{2.5} annual mean limit value. Maidstone has one AQMA declared for NO₂.

To improve air quality, Maidstone Borough Council have introduced a number of measures, these include:

- Introduction of a Park and Ride contract which only uses Euro VI buses.
- Installation of EV charging into Town Centre car parks.
- Green Planting in Upper Stone Street.
- Loading restrictions and double yellow lines in Upper Stone Street.
- Acquisition of three new electric vehicles in MBC vehicle fleet, plus installation of EV charging points at the depot.
- Update of air quality Planning Guidance
- Anti-idling Signage
- Development of the Defra funded digital air quality resource "Pollution Patrol" with the other local authorities across Kent.

Priorities for 2022 are:

- Revocation of the existing AQMA
- Declaration of a new, smaller AQMA based on Upper Stone Street.
- Beginning the development of a new AQAP for the new AQMA
- Continuing development of the DEFRA funded Pollution Patrol resource in order to allow it to launch in the first half of 2022.

Medway Council

Medway Council undertook automatic continuous monitoring at two sites and non- automatic, passive monitoring of NO₂ at 46 sites during 2021.

Medway Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. More detail on these measures can be found in the AQAP (2015). The full Council endorsed the Kent and Medway Energy and Low Emissions Strategy (KMELES) in January 2021. Subsequently a "living" Climate Change Action Plan has been developed, using the KMELES as a framework, and was approved by Cabinet on 8 June 2021. A key focus of the Climate Change Action Plan will be a

reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway. Progress against the plan will be monitored quarterly and the plan updated every year.

Further details of the key objectives and outcomes of the Climate Change Action Plan are listed below, and can be found at the following location: <https://www.medway.gov.uk/climatechangeplan>

- Medway Council will continue to contribute to the county-level version of the UK Climate Change Risk Assessment (CCRIA) which is being led by Kent County Council (KCC). It is Medway Council's responsibility to identify gaps and opportunities to build a climate resilient Medway over the next few years.
- In April 2019 Medway Council declared a Climate Emergency and the Climate Change Action Plan (2021) commits Medway Council to this declaration. The declaration passed a motion to commit to reducing the districts carbon footprint and providing the local community with a clean, green future and to be a place people want to work and live which has a sustainable future. The declaration also commits Medway Council to establish a clear action plan for Medway to deal with climate change, setting out an achievable and clear timeline.
- The Climate Change Action Plan (2021) sets out 11 priority areas for the next five years. There is an aim to develop a joint Kent and Medway approach to achieving a reduction in carbon emissions.

Over the course of the next reporting year, Medway expects to have completed the AQAP for Four Elms Hill AQMA. Measures and progress associated with the Four Elms Hill AQAP will be presented in next year's ASR.

The principal challenge and barrier to implementation that Medway Council anticipates facing is security of funding, and this has led to various measures progressing slower than expected during 2020.

Swale Borough Council

Swale Borough Council has three automatic monitoring stations in operation. All stations measured NO₂ and PM₁₀ and two sites measured PM_{2.5} in 2021. In addition Swale monitored NO₂ at 73 diffusion tube sites. No sites recorded exceedances of the NO₂ AQS objective in 2021. One diffusion tube site did record an annual mean NO₂ concentration within 10% of the AQS objective. There were no exceedances of the PM₁₀ annual mean, however there were 59 exceedances of the 24 hour mean limit of 50 µgm⁻³ (which is not to be exceeded more than 35 times per year) at one site. PM_{2.5} was below the annual mean objective at both sites.

Swale currently has six AQMAs declared, five of these are for NO₂ and one is for NO₂ and PM₁₀ combined.

Swale Borough Council developed an AQAP for 2018-2020, which includes actions and measures to improve air quality. Key priorities include:

- Develop AQAP options which focus on key emissions reduction measures from the HGV and LGV fleet travelling through the AQMAs.
- Evaluation of St Paul's Street, to include and implement strategies to directly reduce PM₁₀ concentrations.
- To engage with Kent County Council regarding delivery of measures, from the Clean Air Feasibility Study.

Thanet District Council

Thanet District Council undertook automatic monitoring of NO₂ and PM₁₀ at two sites during 2021. Monitoring of NO₂ was also undertaken at 39 diffusion tube sites. There were no exceedances of the annual mean NO₂ AQS objective at any of the automatic or diffusion tubes sites. Measured PM₁₀ concentrations also complied with AQS objectives.

Thanet currently has one declared AQMA for NO₂.

Thanet District Council has successfully progressed and implemented the following measures to improve air quality:

- Completion of the installation of rapid electric chargers for taxis and maintenance of electric charging points.
- Progressing the Taxi Licensing Policy, which is currently being updated. This will include incentives for ULEV and age restrictions of the existing fleet. For new licences, taxis must be Euro 6 vehicles, i.e. <7 years.
- Progressing the social media campaign on air quality.
- Developing Pollution Patrol school resource to educate children on air pollution and the impact on health.
- Improvement of KentAir Webpage.

For 2022 the District Council's priorities are

- Continue to progress on-street electric charging joint funding bid with KCC.
- Continue to progress the Taxi Licensing Policy.
- Continue to engage with land-use and transport planners to ensure the actions adhere to the Local Plan and are supported by all parts of the authority.
- Continue to raise awareness of air quality issues within the District.
- Continue to work with Kent County Council to undertake identified feasibility studies of measures to tackle air pollution, to determine more robustly the effectiveness and cost of options.
- Encourage the public to use sustainable transportation, including public transport, car sharing, cycling, and walking.
- Continue the partnership with Kent County Council to engage in a joint approach to tackle air quality issues and the implementation of the Thanet Transport Strategy.
- Adoption of the draft Thanet Council Net Zero Climate Change Strategy and related housing energy strategies.

Tonbridge and Malling Borough Council

Tonbridge & Malling Borough Council undertook automatic monitoring of at two sites during 2021. One site measured NO₂ only, and the other site measured both NO₂ and PM₁₀. The council also undertook passive monitoring of NO₂ at 56 diffusion tube sites in 2021.

One diffusion tube site exceeded the NO₂ annual mean AQS objective and another further along the same road recorded an annual mean NO₂ concentration within 10% of the AQS objective. There were no exceedances of the AQS objectives for PM₁₀.

Tonbridge & Malling Borough Council have declared six AQMAs, all for NO₂.

The Tonbridge & Malling Borough Council Air Quality Action Plan (AQAP) was approved late in 2021 and the council are starting to put the AQAP into effect with plans for electric charging in council carparks underway and anti-idling signs continue to be in place over the taxi rank in Tonbridge outside the station where they are still being adhered to.

Tonbridge and Malling Borough Council continues to work with other councils in Kent as part of the Kent Air quality Partnership and UK Health Security Agency in working on projects that can be used across Kent not just in our own borough. The Bus Quality Partnership for measure 2 of the Air quality action Plan is one example of this.

Tunbridge Wells Borough Council

Tunbridge Wells Borough Council undertook automatic monitoring of NO₂ and PM₁₀ at one site and passive monitoring of NO₂ at 42 diffusion tube sites, during 2021. Both NO₂ and PM₁₀ measured at the automatic monitoring site met their AQS objectives in 2021. However, two diffusion tube sites recorded annual mean NO₂ concentrations above the AQS objective. Tunbridge Wells Borough Council currently have two AQMAs declared for NO₂. One of these was declared at the end of 2021 following a recent assessment.

Tunbridge Wells Borough Council adopted an air quality plan in 2019: The measures to improve air quality include:

- Support for measures to increase the use of sustainable transport modes such as walking and cycling.
- Consider the establishment of an Air Quality Protection zone to replace the AQMA, when we are confident that the AQMA can be revoked.
- Expansion of the Car Club scheme.
- Investigation of a Low Emission Standard for buses.
- Incorporation of an air quality Supplementary Planning Document (SPD) into the emerging Local Plan.
- Use S106 funding to introduce a bike share scheme.
- Engaging with schools to reduce the impact of school traffic.

Priorities for 2022 are as follows:

- To develop an Air Quality Action Plan for the new Hawkhurst AQMA. We anticipate completing a consultation draft by August 2022, holding the consultation between September and November 2022, and finalising the plan by February 2023.
- Complete the development of the 'Pollution Patrol' DEFRA funded digital schools air quality resource, with a view to launching it in the first half of 2022.
- Seek approval for the use of S106 funding to purchase a recondition BAM PM_{2.5} analyser and have it installed in the A26 air quality monitoring station.

