Thurrock Air Quality Action Plan: AQMA 26 – Purfleet Bypass

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

May 2016

Prepared on behalf of
Thurrock Council by:
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SMALL FISH
Strategy Consultants

Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our duty to Local Air Quality Management. It outlines the action we will take to improve air quality in Thurrock's AQMA 26 in Aveley between 2016 and 2020.

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be roughly £16 billion. Thurrock Council is committed to reducing the exposure of people in Thurrock to poor air quality in order to improve health.

We have developed actions for AQMA 26 that can be considered under a number of broad topics:

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

Our priority is to reduce NO_2 emissions at the receptor facades as quickly as possible in AQMA 26 and also to improve resident amenity. In order to do so, our top priority will be to install a series of mature landscaping barriers between the building facades and Purfleet Bypass in order to create a pollution screen and absorption barrier.

We have worked hard to engage with stakeholders and communities which can make a difference to air quality in Thurrock. We would like to thank all those who have worked with us in the past and we look forward to working with you again as well as with new partners as we deliver this new action plan over the coming years.

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 agreed in Europe), but for which we may have useful evidence, and so we will continue to work with regional and central government on policies and issues beyond Thurrock's direct influence.

Responsibilities and Commitment

This AQAP was prepared by the Transport Development Team of Thurrock Council in collaboration with the Council's Air Quality Steering Group with representatives from the following departments:

- Strategic Planning
- Public Protection
- Landscape

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

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

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1 Introduction

In Thurrock, Air Quality issues have been highlighted in relation to two regulated air pollutants – Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}). As Highways Authority, Thurrock Council has a duty under section 84(2) of the 1995 Act to produce an Air Quality Action Plan (AQAP) for all areas declared as Air Quality Management Areas (AQMAs) under the Act. AQAPs set out the measures to be implemented to work towards meeting the air quality objectives in the designated areas.

The 2013 Air Quality Progress Report showed there to be an exceedence of the annual mean objective for NO_2, along the Purfleet Bypass in Purfleet. The 2014 Detailed Assessment of these exceedences confirms that NO_2 is exceeding the annual mean air quality objective of 40 µg/m^3 along the Purfleet By-pass Road that exceeding the objective for NO_2, although 2014 monitoring data showed the area to be slightly below the limit value at 38.09 µg/m^3.

The Council is planning to declare an AQMA for breaching the annual mean objective for NO_2 along part of the Purfleet By-pass, Purfleet. Declaration is likely to take place in 2016.

In accordance with Local Air Quality Management Policy Guidance and Technical Guidance this Air Quality Action Plan for AQMA provides details of monitoring, assessment, feasibility analysis, cost effectiveness and an action plan for improving air quality in line with Government objective to a safe level.

2 Statutory Context

Local air quality is of immediate concern due to the adverse effects of air pollutants such as Nitrogen Dioxide (NO_2), Particulate Matter (PM) and Ozone (O_3) on human health. As a result, the Environment Act 1995 imposes a statutory obligation on local authorities to declare Air Quality Management Areas (AQMAs) where levels of specified air pollutants are predicted to be above set limits. In addition, the incorporation of action measures to improve air quality where transport is identified as a contributor to poor air quality into Local Transport Plans is now a statutory requirement.

Part IV of the Environment Act 1995 introduced new responsibilities to both national and local government throughout the UK. These responsibilities include the requirement upon local authorities to periodically review and assess air quality across their areas. Air quality objectives have been set for those air pollutants deemed to be of most concern. Seven of these pollutants are included under the Local Air Quality Management regime and regulations for these were introduced. The air quality objectives for the pollutants relevant to AQMA 26 are given in **Figure 1**.

Figure 1: Pollutant Objectives Relevant to AQMA 26

Pollutant	Objective	Concentration Measured as	Date (European obligations)
Nitrogen Dioxide (NO_2)	40 µg/m^3	Annual Mean	1 January 2010

The Local Air Quality Management Regime requires all local authorities to review and assess the quality of their local air quality in a staged process. Should this confirm that any of the objectives will not be met within the required timescale, the local authority must designate Air Quality Management Areas (AQMAs) and produce a Local Air Quality Action Plan setting out how it intends to improve air quality in these areas.

As transport authority, Thurrock Council has a duty under section 84(2) of the 1995 Act to produce an Air Quality Action Plan (AQAP). AQAPs set out the measures to be implemented to work towards meeting the air quality objectives in the designated areas. This document is the Air Quality Action Plan for AQMA 26.

3 Air Quality & Health

Local air quality is of immediate concern due to the adverse effects of air pollutants on human health. As a result, the Environment Act 1995 imposes a statutory obligation on local authorities to declare AQMAs where levels of specified air pollutants are predicted to be above set limits. In addition, the incorporation of action measures to improve air quality where transport is identified as a contributor to poor air quality into Local Transport Plans is now a statutory requirement.

All combustion processes in air produce oxides of nitrogen (NO_x). Nitrogen Dioxide (NO_2) and Nitric Oxide (NO) are both oxides of nitrogen and together are referred to as NO_x. Road transport is typically the main source, followed by the electricity supply industry and other industrial and commercial sectors.

The understanding of the effect that air pollution has on human health has increased considerably in the last 20 years, largely through the findings of many epidemiological studies undertaken for populations in various parts of the world. It had previously been recognised that air pollution episodes with very high levels of ambient air pollution are associated with clear and measurable increases in adverse health effects. Recent studies also reveal smaller increases in adverse health effects at the current levels of ambient air pollution typically present in urban areas. The health effects associated with short-term (acute) exposure include premature mortality (deaths brought forward), respiratory and cardio-vascular hospital admissions, and exacerbation of asthma and other respiratory symptoms. It is now reasonably common in the UK for warnings to be issued recommending people avoid exercise or to stay indoors at times of poor air quality.

According to the Government[1] the evidence associating NO_2 with health effects has strengthened substantially in recent years as noted by the Committee on the Medical Effects of Air Pollutants (COMEAP). It is estimated that the effects of NO_2 on mortality are equivalent to 23,500 deaths annually in the UK. The impact of air pollutants represents a significant public health challenge.

NO_2 is associated causally with adverse effects on human health. At high levels NO_2 causes inflammation of the airways. Long-term exposure may affect lung function and respiratory symptoms. NO_2 also enhances the response to allergens in sensitive individuals.

[1] Draft plans to improve air quality in the UK. Tackling nitrogen dioxide in our towns and cities. UK overview Document (Defra, September 2015)

In summary, short term consequences of air pollution include:

- Worsening of frequency and severity of symptoms for those with respiratory disease (including asthma); and
- Increased hospital admissions for cardiopulmonary related conditions.

Long term consequences of air pollution include:

- Premature death from cardiovascular and respiratory diseases, including lung cancer; and
- Permanent impairment of lung function**.**

Some sections of the population are more vulnerable or susceptible to the adverse effects of air pollution. Factors can be related to:

- Demography, in that older people and young children are especially vulnerable;
- Chronic health issues, such as asthma, Chronic Obstructive Pulmonary Disease, and other cardio-vascular/ respiratory related ill-health;
- Lifestyle, for example smokers and those who are physically inactive are more vulnerable;
- Proximity to the source of pollution, such as living near a busy road.

With regard to the scale or significance of the effects of air pollution, the 2010 Global Burden of Disease (GBD) assessment, showed exposure to air pollution is a significant contributor to ill health and when the impact of air pollution is ranked against other harms it ranks quite highly.

4 Monitoring, Review and Assessment

Thurrock Council has been monitoring levels of NO_2 along the Purfleet Bypass since 2011, with a second diffusion tube added in 2012. Results have shown an exceedence of the annual mean NO_2 limit value in 2011, 2012 and 2013. 2014 data remained below the limit value, albeit only marginally.

In 2014, a Detailed Assessment of NO_2 was undertaken on Purfleet Bypass. Modelling results indicated that an AQMA should be declared in this area, as shown overleaf. The modelling indicated that there are three flats at Watt's Wood Park that fall inside the annual mean exceedence line for NO_2; however some of these flats are adjoined to other flats which fall just outside the exceedence line. It was therefore decided that these should be included within the new AQMA in order to have a more stream lined contiguous block for the AQMA. All the other buildings near to the Purfleet Bypass that fell inside the line are classified as non-residential with no relevant receptors and therefore have not been included within the AQMA. The full extent of the AQMA to be declared along Purfleet Bypass is shown in **Figure 3** overleaf.

A total of six blocks of residential flats have been incorporated within the AQMA, these blocks comprise of 2-3 stories high, so there are likely to be considerably more receptors than a standard residential house.

Annual mean concentrations of NO_2 since 2011 in this area are shown in **Figure 2** below.

Figure 2: Annual Mean Concentrations of NO2 2011 – 2014 (µg/m^3)

Year	Purfleet Bypass	Purfleet Bypass A
2011	41.96	
2012	41.11	
2013	40.69	
2014	38.09	35.66

Local Air Quality Management Technical Guidance (TG16) Table 7.6 was also used to predict future NO_2 concentrations in AQMA 26 in 2020, which projected that concentrations will be significantly below the limit value by 2020 at 26.29 µg/m^3. Regardless, action is needed in the intervening years to ensure that the limit value is met as soon as possible.

Source apportionment exercises undertaken in September 2015 have resulted in identifying the proportional source contributions within AQMA 26. As can be seen in **Figure 4**, 37% of NO_2 emissions arise from regional and local background sources. The majority of the remaining emissions arise from HGVs which account for 24% of NO_2 emissions and 23% from cars and 4% light goods vehicles.

Figure 3: AQMA 26

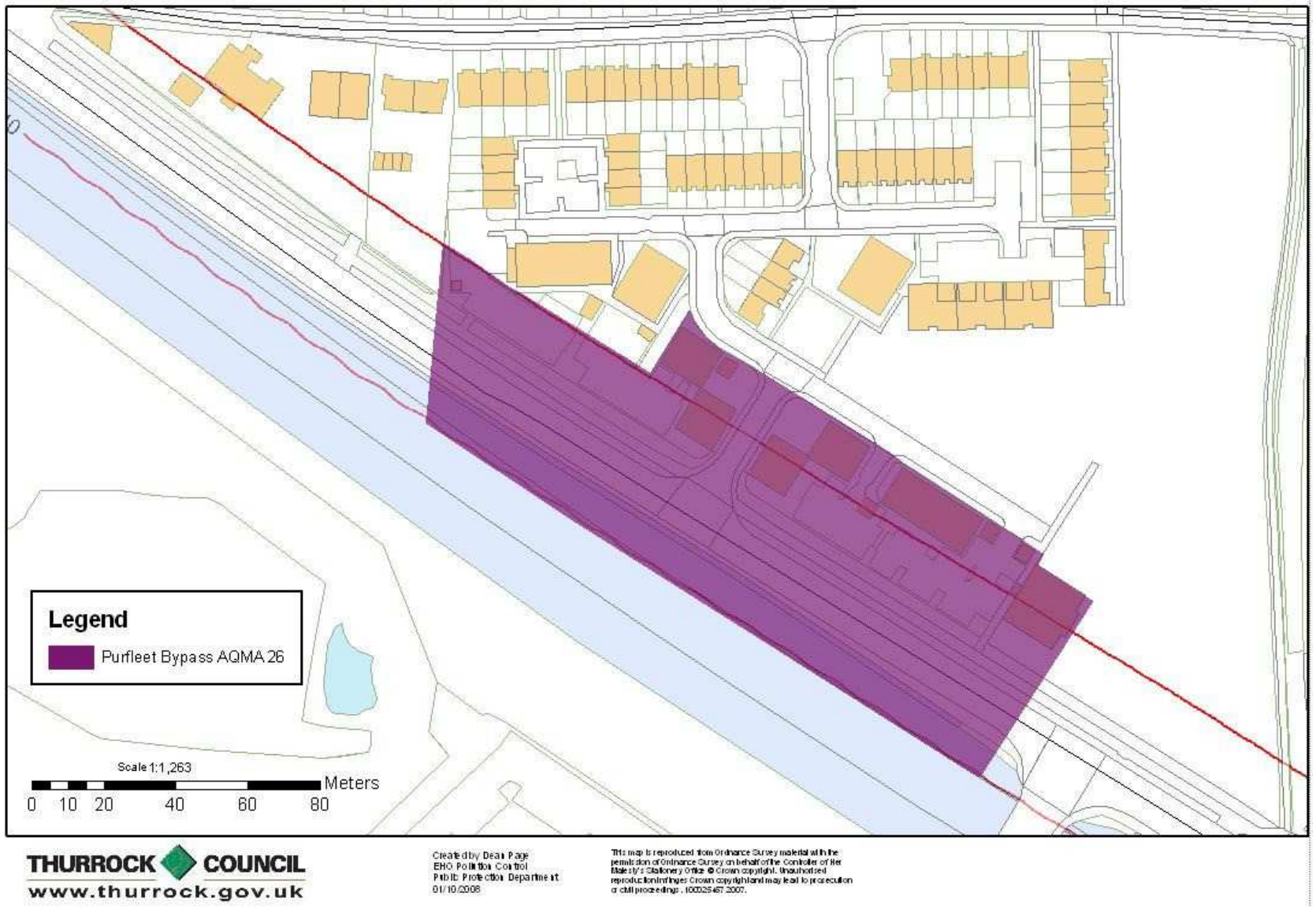
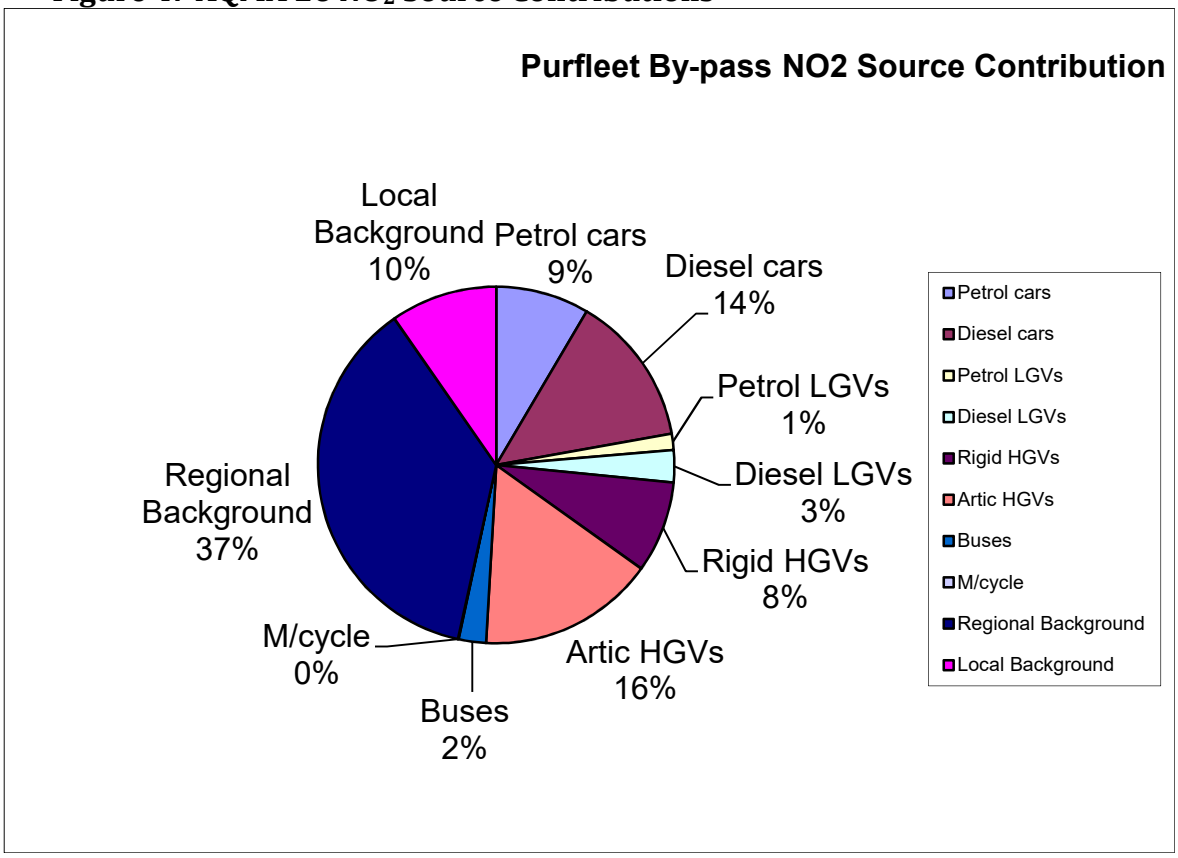


Figure 4: AQMA 26 NO_2 Source Contributions



5 Steering Group

In early 2015, Thurrock Council convened and Air Quality and Health Steering Group with the core aim of developing an Air Quality and Health Strategy, developing Air Quality Action Plans for the new AQMAs and reviewing the existing AQAPs.

The steering group meet on a quarterly basis, with sub-groups meeting more often during key stages of the strategy's production phases.

Led by the Transport Team, the steering group will continue to meet regularly to discuss progress against the strategy and actions plans. The group is comprised of

- transport planners;
- land use planners;
- public health officers;
- environmental health officers;
- landscaping/climate change officer; and
- specialist air quality and transport consultants.

6 Options

A long list of potential options provided within the forthcoming Local Air quality Management Technical Guidance (TG16) and Policy Guidance (PG16) was given through consideration as a starting point. These documents recommend that a suite of options are examined for improving air quality in AQMAs and are shown in the **Figure 5** below. Measures that were considered to be infeasible due to infeasibility, controversial political unacceptability or excessive cost were excluded from further consideration in action planning and this is also shown in **Figure 5** below.

Figure 5: Potential Options for Improving Air Quality in AQMA 26 (Long List)

Measures	Description	Feasible?
Zoning		
20 mph zones	Implementation of 20pmh speed limits in AQMAs. However, a recent study[2] highlighted that NOx emission factors are higher for petrol vehicles over 20mph drive cycles compared to 30mph drive cycles, therefore not considered suitable for implementation, as it would not meet local air quality objectives.	✘
Low Emissions Zones/Clean Air Zones	Could work across a larger area; for example the whole of Purfleet or the whole of the Borough south of the A13.	✓
Clear Zone/Traffic free areas/ Vehicle Bans	Not suitable for a bypass built specifically to accommodate traffic.	✘
Engine Switch Off Zones	Relatively free flowing conditions on Purfleet Bypass means stopping and idling is unlikely.	✘
Public Transport		
Bus Priority	No bus services run along Purfleet Bypass.	✘
Park & Ride	Only likely to be feasible for single high draw destination.	✘
Bus Quality Partnerships	No bus services run along Purfleet Bypass.	✘
Light Rail or Tram	Delivery of such a scheme would be incredibly expensive, particularly for such as small area, and therefore unlikely due to cost and feasibility.	✘

[2] Transport and Environmental Analysis Group, Centre for Transport Studies, Imperial College London. *An evaluation of the estimated impacts on vehicle emissions of a 20mph speed restriction in central London: FINAL REPORT*, April 2013.

Measures	Description	Feasible?
Rapid Transit	Thurrock, in consortium with Southend and Essex County Council, previously bid for a South Essex Rapid Transit scheme to the DfT as a major scheme, which was unsuccessful. It is therefore not considered feasible for delivery to improve air quality.	✘
Contracted Public Transport	No bus services run along Purfleet Bypass.	✘
Fiscal Measures		
Congestion Charging/ Tolls	Generally only undertaken in densely populated urban areas, such as London. Not likely to be suitable for Thurrock and such schemes can be very politically challenging, as they tend to be publicly unpopular. It is therefore not considered feasible for delivery to improve air quality in Thurrock.	✘
Workplace Parking Levy	Not likely to be suitable for Purfleet Bypass as there is no specific concentration of employers as there would be in a city centre.	✘
Parking Charges	Only likely to be effective in areas with a single large attraction.	✘
Smarter Choices		
Personalised Journey Planning	Journey planning undertaken by experts or volunteers on a personal level to find sustainable alternative modes to regular and frequent journeys.	✓
Car-sharing	Sharing common trips and travel expenses between two or more people.	✓
School Travel Plans	Purfleet Bypass is relatively unlikely to be used for local trips to school.	✘
Travel Plans	Not likely to be suitable for this area as there is no specific concentration of large employers or single destination within the AQMA, which is predominantly residential.	✘
Traffic Management		
Urban Traffic Management and Control	Not likely to be a large enough concentration of signals within the AQMA, as tailbacks are unlikely with the road having a relatively smooth flow.	✘
Dedicated Lanes/ High Occupancy Vehicle Lanes	AQMA 26 does not contain any roads with multiple lanes, so measure is considered unsuitable.	✘
Infrastructure Improvement		
Pedestrianisation	Not suitable for a bypass built specifically to accommodate traffic.	✘

Measures	Description	Feasible?
Improved walking and cycling provision	AQMA has good provision of footpaths, but poor connectivity to Purfleet due to railway. Providing rail crossing likely to be too expensive and not effective enough to tackle pollution problem.	✗
Traffic Calming	Not suitable for a bypass built specifically to accommodate traffic.	✗
Road System Re-design	Not suitable for a bypass built specifically to accommodate traffic.	✗
Bypasses and Road Building	Already includes a bypass.	✗
Planning		
Land Use Planning	Ensure that any new development along Purfleet Bypass is of a sufficient stand-off distance and with no opening windows towards the road.	✓
Car-free Residential Development	Best focused in areas with large scale growth allocations and only acceptable in areas where excellent services and facilities are accessible by sustainable transport. AQMA 26 is somewhat disconnected from rest of Borough via sustainable modes.	✗
Low Emission Transport		
Retrofit Pollution Reduction Equipment	Most effective on disproportionately polluting vehicles, such as HGVs and buses, of which few numbers travel through this AQMA, so unlikely to be effective.	✓
Alternative fuel use	Retrofit likely to be more effective for HGVs and there are no buses travelling through this AQMA.	✗
Eco Driving	Training provided to drivers to teach ways of reducing emissions and improving fuel economy.	✓
Other		
Pollution Barriers	Large verges available in this area would enable one or two layers of pollution absorbent planting and also provide screening barrier.	✓
Landscaping	Large verges available in this area would enable one or two layers of pollution absorbent planting and also provide screening barrier.	✓
Pollution Absorbent Materials	Not a lot of surface area available for pollution absorbent paint and other hard surfacing materials are relatively new to be replaced.	✗

7 Actions

Figure 6 shows the AQMA 26 AQAP measures. It contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction;
- the timescale for implementation
- how progress will be monitored

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

7.1 Detailed Description of AQAP Measures

7.1.1 Pollution Barriers and Landscaping

There is potential for the introduction of large scale planting as a pollution barrier in AQMA 26, where there is sufficient verge width to introduce such planting. However, it is understood that there is a gas main running in this area, so any planting regime will require careful planning. Ideally, the Council will look to install a line of mature, pollution absorbent hedges or trees that will provide pollution protection year round.

This measure will also lead to public realm improvements for residents and generally create a less traffic oriented outlook.

Any planting undertaken will be coupled with the installation of diffusion tubes on relevant receptor façade for monitoring purposes to determine the efficacy.

7.1.2 Land Use Planning

Planning policies have been developed through the Thurrock Air Quality and Health Strategy for incorporation into the new Local Plan which focus on avoiding exacerbating existing AQMAs, avoiding the creation new AQMAs, ensuring planning permissions include measures that deliver the Air Quality Strategy, car-free developments as part of masterplanning, and include air quality measures in the Community Infrastructure Levy.

In particular, any further development along the Purfleet Bypass should have a significantly greater standoff from the roadside, should be accompanied by a planting and landscaping scheme to create a pollution absorbent barrier and/or should only have non-opening windows and no vents on road facing walls.

7.1.3 Smarter Choices Package – Backup Actions

If the pollution barrier proves to not be effective by March 2017, the Council will then look to deliver a package of Smarter Choices measures to residents within AQMA 26 to reduce emission from residents driving and encourage alternative modes.

Car-sharing is already being delivered Borough wide through the Local Sustainable Transport Fund programme. However, as AQMA 26 contains blocks of flats, it offers a single origin point and a car sharing scheme for the flats would be developed.

Eco-driver training is being implemented with HGV drivers around AQMA 10 in Purfleet, but this programme would be extended to reach a larger number of lorry drivers and logistics operators travelling through the Purfleet area, including AQMA 26. This scheme would also be extended to AQMA 26 residents.

Thurrock Council delivered a large scale personalised journey planning programme as part of the Local Sustainable Transport Fund. However, that programme did not reach the residents of AQMA 26 and therefore, if necessary, would be extended to include the residents of AQMA 26.

7.1.4 Low Emissions/Clean Air Zones & Ancillary Measures – Under Review

The Thurrock Air Quality and Health Strategy indicates an interest in considering further the implementation and delivery of a Clean Air Zone in Thurrock. However, given the Government's intention to publish a national framework for governing Clean Air Zones in 2016, this matter will be kept under annual review to determine whether one should be developed for Thurrock.

It is likely that any Clean Air Zone will need to be phased over a number of years and it is likely that the Council would look to work with the Government to roll out a programme in advance of a Clean Air Zone for retrofitting existing vehicles travelling regularly through Thurrock in order to ensure compliance.

Figure 6: AQAP for AQMA 26

Measure No.	Measure	EU Category	EU Classification	Lead Authority/ Department	Planning Phase	Implementation Phase	Indicator	Target Pollution Reduction	Estimated Completion Date	£	Comments
1	Mature Landscaping Barrier	Transport Planning & Infrastructure	Other	Landscaping	Apr – Aug 2016	Sep – Nov 2016	NO_2 concentrations at receptor facades	2.0+ $\mu g/m^3$*	Nov 2016	£25k	At receptor facades
2	Land Use Planning	Policy Guidance & Development Control	Air Quality Planning & Policy Guidance	Planning	Jan – Mar 2016	April 2016 onwards	No further AQMAs created in this area as a result of new development	N/A	Ongoing	N/A	See Policy AQS8 in Thurrock Air Quality and Health Strategy
3	Car-Sharing	Alternatives to private vehicle use	Car & lift sharing schemes	Transport	To be delivered as a Smarter Choices package only if Measure No. 1 (landscaping) is not successful in reducing emissions at receptor facades.						Car-Sharing Scheme for AQMA 26 residents
4	Personalised Journey Planning	Promoting Travel Alternatives	Personalised Travel Planning	Transport							PJP for AQMA 26 residents.
7	Eco Driving	Vehicle Fleet Efficient	Driver Training and ECO driving aids	Transport							Training for AQMA 26 residents
5	Clean Air Zones	Promotion of Low Emission Transport	Low Emission Zones	Transport	To be reviewed annually.						
6	Retrofit Pollution Reduction Equipment	Vehicle Fleet Efficiency	Vehicle Retrofitting Programmes	Transport	To be rolled out in advance of Clean Air Zone to aid compliance.						

8 Consultation and Stakeholder Engagement

In developing this AQAP, the Council has worked with other agencies, businesses and the local community to improve local air quality.

Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in **Figure 7**. In addition, we have undertaken the following stakeholder engagement:

- website
- Articles in local newspaper
- Questionnaires distributed directly to households within AQMA

Figure 7: Consultation Undertaken

Consultee	Summary of Response
Secretary of State	
Environment Agency	
Highways Agency	
Neighbouring Local Authorities:	
Basildon	
Bexley	
Castle Point	
Havering	
Medway	
Local Residents	
Local Businesses	