



**BRENTWOOD BOROUGH COUNCIL**  
**AIR QUALITY ACTION PLAN**  
**OCTOBER 2008**

Environmental Health Service  
Town Hall  
Ingrave Road  
Brentwood  
Essex CM15 8AY

## **Executive Summary**

In January 2005 the Council declared seven separate Air Quality Management Areas (AQMA) within the Borough. Six of the AQMA are associated with major trunk roads, (the A12 and M25) and the seventh is in the heart of the town centre at Wilson's Corner. The declaration followed on from assessments of the Borough's air quality that indicated that government objectives for nitrogen dioxide (NO<sub>2</sub>) are not likely to be met at relevant target dates.

The main source of air pollution at the AQMA is derived from road traffic and this plan proposes various actions which could be implemented in order to achieve the air quality objective.

A number of actions have been identified and summarised in section 6 of the document. These are preceded by a discussion of the options available. The poor air quality comes from two very different environments, i.e. the trunk road and the town centre. The problems that these present are therefore discussed separately. The solutions comprise "hard" and "soft" solutions. The hard solutions, comprising highway engineering and infrastructure matters whilst the soft solutions comprise modal shift and promoting more sustainable transport such as buses, cycling and walking.

This Council and statutory partners have already made advances in terms of air quality and some of the actions proposed are already in place or under consideration. Many of these proposals will also coincide with those identified by future climate change policies.

This Council does not have control over many of the problems and their solutions and is therefore reliant on others implementing improvements. However this Council, quite rightly, should be at the heart of the community encouraging all parties to progress these issues. To this end the Council is in regular liaison with Essex County Council and the Highways Agency who have been the main collaborators in producing this document.

<b><u>Contents</u></b>	<b>Page</b>
<b>INTRODUCTION.....</b>	<b>4</b>
<b>CHARACTERISTICS OF THE AIR QUALITY MANAGEMENT AREAS.....</b>	<b>6</b>
<b>EXISTING POLICIES.....</b>	<b>13</b>
<b>TRANSPORT ISSUES.....</b>	<b>17</b>
<b>IMPACTS AND COSTS .....</b>	<b>28</b>
<b>ACTION PLAN AND IMPLEMENTATION.....</b>	<b>30</b>
<b>DETAILED CONSIDERATION OF ACTION PLAN OPTIONS.....</b>	<b>35</b>
<b>CONSULTATION AND STAKEHOLDER ENGAGEMENT .....</b>	<b>43</b>
<b><u>APPENDICES</u></b>	
<b>APPENDIX 1</b>	
<b>National Air Quality Objectives and European Directive Limit and Target     Values for the Protection of Human Health.....</b>	<b>46</b>
<b>APPENDIX 2</b>	
<b>Maps of Air Quality Management Areas .....</b>	<b>48</b>
<b>APPENDIX 3</b>	
<b>Aerial View of Wilson’s Corner.....</b>	<b>55</b>

## 1.0 INTRODUCTION

- 1.1 The Environment Act 1995 introduced a new framework for air quality management at both a national and local level. The Secretary of State was required to draw up a National Air Quality Strategy and local authorities were required to review and assess local air quality against standards and objectives and, where necessary, to declare air quality management areas (AQMA).
- 1.2 The first National Air Quality Strategy was published in 1997 and reviewed and updated at intervals. The current National Air Quality Strategy was issued in 2007. The Strategy outlines a national framework for reducing hazards to health from air pollution and has set objectives for the eight main health threatening pollutants, namely:-

Nitrogen Dioxide  
PM<sub>10</sub> Particulates  
Benzene  
1, 3 - Butadiene  
Lead  
Sulphur Dioxide  
Carbon Monoxide  
Ozone

- 1.3 Apart from ozone, these objectives were given statutory backing in the Air Quality Regulations 2000.

The current UK Air Quality Strategy objectives that local authorities are required to assess are reproduced at Appendix 1.

- 1.4 The Council has assessed the air quality within the Borough against national objectives for all the pollutants above, other than ozone (which is not considered to be a pollutant that can be controlled locally).

Assessment has been undertaken having regard to Government guidance and was done in stages so that potential areas of concern could be focused upon. The second round of review and assessment concluded that, whilst most of the Borough was expected to meet the Air Quality Objectives by their respective target dates, seven small areas in the Borough were likely to exceed the annual mean nitrogen dioxide (NO<sub>2</sub>) objective in 2005 at relevant locations (i.e. locations where the objectives are not achieved AND members of the public may be exposed for a large fraction of the period in question). On the 10th January 2005, the Council declared these seven areas as Air Quality Management Areas (AQMA). The seven AQMAs are:

- i) Nags Head Lane, at its junction with the M25
- ii) Brook Street, at its junction with the M25 and A12 (Brook Street Roundabout)
- iii) Greenshaw/Porters Close near to the A12 Brentwood Bypass

- iv) Warescot Road/Hartswood Avenue/Ongar Road at their junction with the A12
- v) B1002 Roman Road, Mountnessing close to the A12
- vi) Fryerning Lane, Pemberton Avenue and Trimble Close, close to the A12
- vii) Junction of A128/A1023 - Wilson's Corner

Maps showing the location and extent of the areas are copied at Appendix 2.

- 1.5 Nitrogen dioxide is a by-product of combustion and all the areas of exceedence are associated with road traffic. Six of the areas are in close proximity to the M25 and/or the A12, whilst the other AQMA is situated in the town centre in an area suffering from traffic congestion.
- 1.6 Having identified areas where the national objectives were likely to be exceeded, and declared them as AQMAs, the Council commissioned a further assessment to:
  - i) confirm the original assessment of air quality
  - ii) to calculate more accurately how much of an improvement in air quality would be needed to deliver the air quality objectives
  - iii) to refine knowledge of the sources of pollution so that air quality action plan measures can be properly targeted
  - iv) to provide quantification of air quality impacts on introducing particular air quality action plan measures through scenario testing.
- 1.7 The detailed conclusions of that report are discussed later in this document.

The Council has had various discussions and meetings with other stakeholders, particularly Essex County Council and the Highways Agency, in order to identify those practical options which could be taken to reduce pollution levels within the AQMA and hence produced this Action Plan.

## **2.0 CHARACTERISTICS OF THE AIR QUALITY MANAGEMENT AREAS**

### **2.1 Background**

- 2.1.1 Brentwood is a predominantly rural/suburban area bordering the north-east boundary of London. The Borough is located within the Metropolitan Green Belt. The M25 London Orbital motorway runs along the south-west of the Borough and the A12 runs through the Borough and is the main feeder road from East Anglia into London.
- 2.1.2 The AQMAs can be split into two very different categories: those associated with the trunk roads, and the AQMA associated with the town centre. All the AQMAs have been designated due to the predicted failure to meet the annual mean air quality objective for nitrogen dioxide.
- 2.1.3 The first six areas are located at the junction of the M25 and the A12 and at areas along both trunk roads where residential property is in close proximity. Exceedence of the air quality objective is due to high volumes of traffic along these routes, most of which constitute through traffic rather than local traffic, being part of the national trunk road system. The Highways Agency is responsible for managing both these roads and has been the main stakeholder in considering what actions may be appropriate to reduce pollution levels. The six AQMAs are considered together as the solution will mostly be common to all the AQMAs.
- 2.1.4 The seventh AQMA is located at the junction of the A128 and the A1023, which is at the eastern end of Brentwood High Street and known locally as Wilson's Corner. The junction comprises a pair of mini-roundabouts as the junction is not aligned in a straight line. The A128 runs north to south through the centre of the Borough, linking Ongar to Grays. The A1023 runs east from the M25 through to Hutton and Billericay. These roads are the main feeder roads into Brentwood and a lot of the traffic at Wilson's Corner will be local traffic, particularly during the morning and evening rush hour periods. A photograph of this junction can be seen at Appendix 3 (taken outside of hours with peak traffic flow).

### **2.2. Local Air Quality Management Further Assessment**

#### **2.2.1 Verification of Results**

The air quality objective for nitrogen dioxide is considered in two ways, a one-hour mean (i.e. short periods of acute exposure) or an annual mean. In Brentwood's case, the exceedence concerns the annual mean.

The further assessment verified modelled predictions showing up exceedences of the NO<sub>2</sub> Annual Mean in 2005 within the 7 AQMAs in the range 1.0 - 8.4 µg.m<sup>3</sup> and confirm that the original designation of the AQMAs by the Council was justified in each case.

By 2010, the model predictions indicate that the NO<sub>2</sub> Annual Mean Objective will be met at receptors within all AQMA areas, with the exception of the A12/M25 junction AQMA, due to expected reductions in background concentrations through implementation of national level policies, such as improvements in vehicle emissions standards. It should be noted that predicted future national emission databases can be prone to error.

### 2.2.2 Source Apportionment

Source apportionment is a technical activity that estimates the relative contributions to the assessed air quality levels from various emission sources.

Receptors were selected for relevant locations at the building façades within the declared AQMAs.

Additional modelling was undertaken to provide NO<sub>x</sub> source apportionment for receptors within the AQMAs using emission factors for light duty vehicle (LDV) and heavy duty vehicle (HDV) classes, together with the corresponding percentage of the traffic flow. The percent contribution from each vehicle class can therefore be calculated. Table 1 shows source contributions of NO<sub>x</sub> concentrations within the AQMA.

The results of the source apportionment indicate that road traffic emissions are the main source of NO<sub>x</sub> concentrations in the AQMA (>80%). The HDV class vehicles are contributing disproportionately to NO<sub>x</sub> concentrations in the AQMAs contributing almost half of NO<sub>x</sub> concentrations (39.9 – 59.5%) but being only a small proportion (1.3 – 18.4%) of the vehicle fleet on relevant roads within the AQMAs.

**Table 1**  
**Source apportionment of NO<sub>x</sub> concentrations at building façades within the AQMAs**

<b>AQMA</b>	<b>NO<sub>x</sub> concentrations 2005</b>	<b>%</b>	<b>µg/m<sup>3</sup></b>
<b>M25/A12 Junction</b>	<b>Background</b>	14	27.8
	<b>Road traffic</b>	86	173.2
	<b>HDV*</b>	58	117.0
	<b>LDV*</b>	28	56.2
<b>M25 Nags Head Lane</b>	<b>Background</b>	14.5	27.8
	<b>Road traffic</b>	85.5	164.2
	<b>HDV*</b>	59.5	114.1
	<b>LDV*</b>	26.0	50.1
<b>A12 Greenshaw</b>	<b>Background</b>	18.6	27.8
	<b>Road traffic</b>	81.4	121.9
	<b>HDV*</b>	49.8	74.6
	<b>LDV*</b>	31.6	47.3
<b>A12 Warecot Road</b>	<b>Background</b>	19.7	27.8
	<b>Road traffic</b>	80.3	113.4
	<b>HDV*</b>	48.2	68.1
	<b>LDV*</b>	32.1	45.3

<b>A12 Heybridge</b>	<b>Background</b>	19.7	27.8
	<b>Road traffic</b>	80.3	113.6
	<b>HDV*</b>	47.4	67.1
	<b>LDV*</b>	32.9	46.6
<b>A12 Ingatestone</b>	<b>Background</b>	16	27.8
	<b>Road traffic</b>	84	145.7
	<b>HDV*</b>	51.4	89.1
	<b>LDV*</b>	32.6	56.6
<b>A128/A1023 Wilson's Corner Junction</b>	<b>Background</b>	16.4	27.8
	<b>Road traffic</b>	83.6	141.7
	<b>HDV*</b>	39.9	67.6
	<b>LDV*</b>	43.7	74.1
<b>*As proportion of road traffic emissions contribution</b>			

### 2.2.3 Required NO<sub>x</sub> Reduction

A requirement of Further Assessment is to determine the amount of NO<sub>2</sub> reduction (as NO<sub>x</sub>) required at the worst-case receptors within an AQMA. This approach highlights the maximum reduction in NO<sub>2</sub> (as NO<sub>x</sub> (µg/m<sup>3</sup>)) required and assumes that other receptor points will require less of a reduction. For the current assessment, the approach for identification of NO<sub>2</sub> has been to determine the levels of NO<sub>x</sub> for the highest concentrations from receptors. The results are shown in Table 2.

In order to determine the amount of NO<sub>x</sub> reduction required the annual mean objective of 40 µg/m<sup>3</sup> NO<sub>2</sub> is calculated to be an equivalent NO<sub>x</sub> concentration of 134 µg/m<sup>3</sup> using LAQM.PG(03), taking into account background concentrations in 2005, i.e. the Council has used approved technical methods to estimate the level of NO<sub>x</sub> concentrations that should be achieved in order to achieve the air quality objective for NO<sub>2</sub>.



**Table 2 NO<sub>x</sub> and NO<sub>2</sub> reduction required at the receptor façades with maximum predicted NO<sub>2</sub> concentrations in 2005**

		NO <sub>x</sub> (µg/m <sup>3</sup> )	Reduction in NO <sub>x</sub> required	% Improvement NO <sub>x</sub>	NO <sub>2</sub> (µg/m <sup>3</sup> )	Reduction NO <sub>2</sub> required	% Improvement in NO <sub>2</sub>	Year NO <sub>2</sub> Objective predicted to be met
	<b>Annual mean Objective</b>	<b>134</b>	<b>= NO<sub>x</sub> conc. at receptor – 134</b>		<b>40</b>	<b>= NO<sub>2</sub> conc. at receptor – 40</b>		<b>Projected forward using LAQM.TG(03)</b>
<b>AQMA</b>	<b>Receptor location</b>	<b>2005</b>						
A12 Hey Bridge	58 Roman Road	141.4	7.4	5.3	41.1	1.1	2.6	2006
A12 Warescot Road	4 Hurstwood Avenue	141.3	7.3	5.2	41.0	1.0	2.6	2006
A12 Greenshaw	65 Greenshaw	149.8	15.8	10.5	42.2	2.2	5.2	2007
A12/M25	73 Brook Street	201.0	67.0	33.3	48.4	8.4	17.4	2008
M25 Nags Head Lane	21 Nags Head Lane	152.5	18.5	12.2	42.6	2.6	6.0	2007
A12 Ingatestone	9 Trimble Close	173.5	39.5	22.8	45.2	5.2	11.6	2008
A128.A1023 Wilson's Corner	2 Ongar Place	169.5	35.5	20.9	44.7	4.7	10.6	2008

NB Source BBC LAQM/ Further Assessment November 2005 (based on 2004 meteorological data)

(1) M25/A12 Junction AQMA

The maximum NO<sub>x</sub> reduction required within the A12/M25 Junction AQMA at the façade is 67 µg/m<sup>3</sup> (equivalent to a 33% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 8.4µg/m<sup>3</sup> (equivalent to a 17% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(2) M25 Nags Head Lane AQMA

The maximum NO<sub>x</sub> reduction required within the M25 Nags Head Lane AQMA at the façade is 18.5 µg/m<sup>3</sup> (equivalent to a 12.2% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 2.6µg/m<sup>3</sup> (equivalent to a 6% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(3) A12 Greenshaw AQMA

The maximum NO<sub>x</sub> reduction required within the A12 Greenshaw AQMA at the façade is 15.8 µg/m<sup>3</sup> (equivalent to a 10.5% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 2.2µg/m<sup>3</sup> (equivalent to a 5.2% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(4) A12 Warecot Road AQMA

The maximum NO<sub>x</sub> reduction required within the A12 Warecot Road AQMA at the façade is 7.3 µg/m<sup>3</sup> (equivalent to a 5.2% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 1.0µg/m<sup>3</sup> (equivalent to a 2.6% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(5) A12 Hey Bridge AQMA

The maximum NO<sub>x</sub> reduction required within the A12 Hey Bridge AQMA at the façade is 7.4 µg/m<sup>3</sup> (equivalent to a 5.3% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 1.1µg/m<sup>3</sup> (equivalent to a 2.6% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(6) A12 Ingatestone AQMA

The maximum NO<sub>x</sub> reduction required within the A12 Ingatestone AQMA at the façade is 39.5 µg/m<sup>3</sup> (equivalent to a 22.8% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 5.2µg/m<sup>3</sup> (equivalent to a 11.6% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount.

(7) A12/A1023 Wilson's Corner Junction AQMA

The maximum NO<sub>x</sub> reduction required within the Wilson's Corner AQMA at the façade is 35.5 µg/m<sup>3</sup> (equivalent to a 20.9% improvement in NO<sub>x</sub>) in 2005 and NO<sub>2</sub> reduction is 4.7µg/m<sup>3</sup> (equivalent to a 10.6% improvement in NO<sub>2</sub>). Consequently, the formulation of an Action Plan should aim to reduce the levels of NO<sub>x</sub>/NO<sub>2</sub> within the AQMA by this amount. This will bring the level to within the Government Objective and the LTP target.

These estimated reductions that the Council predicted to occur by 2010 are based on Government predictions of emissions due to improvements in the national fleet, as identified in the National Air Quality Strategy. They should be considered with a precautionary approach as predicted improvements have not always been wholly realised.

The NO<sub>2</sub> concentrations at the façades of properties within the AQMAs are predicted through modelling to fall within the range of 30.6 – 48.4 µg/m<sup>3</sup> in 2005. This corresponds well with projected (2005) monitored data which fall within the range 29.0 - 45.2µg/m<sup>3</sup>. The further assessment verified modelled predictions show exceedences of the NO<sub>2</sub> Annual Mean in 2005 within the 7 AQMA areas in the range 1.0 – 8.4 µg/m<sup>3</sup> and confirm that the original designation of the AQMA areas by Brentwood Borough Council was justified.

The dominant source of NO<sub>2</sub> in the AQMA is road traffic, contributing >80% to NO<sub>x</sub> concentrations in the AQMAs. Source apportionment of the road traffic emissions, indicates that the HDV vehicle class is the most significant source of traffic NO<sub>x</sub>, contributing disproportionately to NO<sub>x</sub> emissions.

The HDV element of the traffic comprises mainly of lorries with buses/coaches comprising a significantly lower contribution. The A12 is the major trunk road linking the east coast ports of Harwich and Felixstowe with London as well as providing the main commuter route from East Anglia. The town does not have a bus station and is not serviced by a lot of coaches. Heavy goods lorries tend to avoid Brentwood town centre if they can and use the trunk roads. However, when there is a problem on the A12, M25 or M11, it is not unusual for a lot of traffic, especially lorries, to divert off the trunk road system and travel through Brentwood. The main routes through Brentwood will go via the Wilson's Corner AQMA.

Traffic queuing at Wilson's Corner occurs for at least four hours of each school day and congestion is a major issue at this junction. It is commonplace for queues to form along the A12, particularly at the point adjacent to Heybridge where it goes from three to two lanes.

A NO<sub>x</sub> improvement of 7- 67µg/m<sup>3</sup> (5 - 33%) is required in the AQMAs in order for the NO<sub>2</sub> annual mean Objective to be met. Consequently, the formulation of an Action Plan should make progress into reducing the levels of NO<sub>x</sub> within the AQMAs by this amount.

## 2.3 **Nitrogen Dioxide and its Health Effects**

- 2.3.1 All the AQMAs fail to meet the air quality objective with regard to the annual mean of nitrogen dioxide. Nitrogen oxides are a product of combustion of fossil fuels. They are therefore associated with processes involving the burning of fuel, such as petrol and diesel engines, domestic central heating and industrial processes, including power stations. In Brentwood's case, there is no relevant industrial source and the prime source is vehicle related. All the AQMA are associated either with heavily trafficked roads or at Wilson's Corner with traffic congestion.
- 2.3.2 Nitrogen dioxide is associated with adverse health effects. There is evidence that high levels of it can inflame the airways in our lungs and, over a long period of time, affect how well our lungs work. People with asthma are particularly affected. Nitrogen dioxide can also adversely affect vegetation.

### **3.0 EXISTING POLICIES**

#### **3.1 Introduction**

3.1.1 Any policies designed to combat pollution from road traffic will invariably overlap with other policies designed for other purposes. It is not the intention of this document to detail every policy from national through regional to local strategies that may impinge on air quality control and mitigation. However, some of these documents are crucial to providing the vehicle for delivering improvements in air quality. Other strategies, such as those concerning climate change, will also have similar objectives to any air quality action plan.

3.1.2 The main relevant supporting policies are:-

- a) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - July 2007.
- b) Brentwood Borough Council Corporate Strategic Plan 2005-2010.
- c) Brentwood Replacement Local Plan - adopted August 2005.
- d) Essex Local Transport Plan 2006/2011.

#### **3.2 National Air Quality Strategy**

3.2.1 Air pollution does not respect local authority boundaries and no local action plan dealing with traffic can be successful on its own. The national strategy deals with issues such as vehicle emission targets and legislation. The strategy is very wide-ranging and clearly addresses issues beyond the reach of local authorities. The practical result of consequent strategies is that emissions from individual vehicles have been reducing significantly over time. However, this has been negated to a certain extent by increased traffic flows. Although there has been a long-term trend of reducing emissions the challenge is, at a local level, to encourage modal shift to less polluting forms of transport. Reference should be made to the national strategy for details of the more over-arching policies.

#### **3.3 Corporate Strategic Plan 2005-2010**

3.3.1 This document highlights the main priorities of the Council over the coming years. In particular, it identifies traffic congestion as an important element of quality of life in Brentwood. It states that:-

*“Traffic flows within Brentwood are recognised by the public as requiring improvement and this is a particular issue during the peak travel times.*

*Brentwood’s location close to the major roads of the A12, the A127 and the M25 motorway is advantageous but, when there are problems and accidents on these roads, Brentwood*

*becomes an alternative route for drivers. This compounds the already high local traffic movements at peak times.*

*There are no easy solutions to these issues but the Council has been working closely with Essex County Council to explore improvements in the Town Centre”*

3.3.2 The Brentwood High Street Area Transportation Study has been exploring options to improve traffic flows through the Town Centre and public transport issues have been considered as part of the process”

Action Objectives	Key Actions
Reduce Town Centre Traffic Congestion	<ul style="list-style-type: none"> <li>• Contribute to the detailed design for improvements for traffic flows in the Town Centre under the Brentwood High Street Traffic Study</li> </ul>
	<ul style="list-style-type: none"> <li>• Assist the County Council with the implementation of the Brentwood High Street Area Improvement Scheme</li> </ul>
	<ul style="list-style-type: none"> <li>• Pursue measures to improve public transport, particularly for the rural areas, in partnership with others but, in particular, the bus operating companies and to encourage the use of public transport through the Council’s Concessionary Travel Scheme</li> </ul>

**3.4 Brentwood Replacement Local Plan**

3.4.1 This document details the Council’s planning policies for the immediate future.

In general, it is not the policy of the Council that areas designated as an AQMA will remain sterile in development terms but developers are expected to minimise the effects of poor air quality and have regard to Planning Policy Statement 23 “Planning and Pollution Control” and “Local Air Quality Management Policy Guidance LAQM.PG(03)”. Developers with proposals within or close to an AQMA are encouraged to have pre-application talks with Council Officers. Large developments within an AQMA or in such close proximity as to affect the air quality within an AQMA would be expected to carry out an environmental assessment of the likely air quality effects of the development in accordance with advice in the NSCA documents “Development Control: Planning for Air Quality” (issued in November 2004 with an update in 2006). Policy PC7 is applicable:-

**PPC7 Areas of Poor Air Quality**

*“In identified Air Quality Management Areas, development for residential or other sensitive uses should have regard to PPS23 ‘Planning and Pollution Control’ and ‘Local Air Quality*

*Management Policy Guidance LAQM.PG(03)'. Commercial developments likely to have significant detrimental impacts on air quality in these areas will not be permitted."*

- 3.4.2 If adverse air quality effects are identified to impact on an AQMA, then it is normal practice for the Council to negotiate with the developer how these adverse impacts could be mitigated. Each application is dealt with on its individual merits. These community benefits offset any significant adverse impacts and are normally delivered via 'Section 106 Agreements'. Policy CP4 applies:-

#### CP4 The Provision of Infrastructure and Community Facilities

*"Development will not be permitted unless it makes provision for community facilities, public services, transport provision, infrastructure, environmental works and any other requirements which are relevant to planning and which are made necessary by, and are directly related to, the proposed development.*

*Where appropriate, development proposals will be expected to be accompanied by a statement indicating how such provision is to be met.*

*Developers will be required to finance the full cost or, if appropriate, a contribution towards the full cost of all such provision that is fairly and reasonably related in scale and kind to the proposed development and its impacts on the wider environment. This provision will be subject to planning obligations, which will be secured prior to the issue of planning permission. These obligations will specify the nature and timing of all provisions, both on and off a development site, made necessary by the development concerned."*

### 3.5 **Essex Local Transport Plan 2006/2011**

- 3.5.1 The LTP is produced by Essex County Council and covers the whole of Essex, except the Unitary Authorities at Southend and Thurrock. The plan identifies five objectives, which include tackling congestion and promoting better air quality. As congestion often leads to elevated levels of air pollution, these two objectives are inter-related. By identifying these two issues as main objectives, the County Council has given a commitment, in partnership with the District Council, to tackle these issues.
- 3.5.2 The LTP identifies general policies designed to tackle congestion and air quality and also considers local solutions to deal with individual local problems.

Six general themes form the basis of the strategy:-

1. **Demand Management:** To regulate the use of services or networks, including the possibility of road charging, high occupancy vehicle incentives, parking charges, travel planning and improvements to the cycling and walking networks.
2. **Reducing the Need to Travel by Car:** To change transport patterns; for example, through school and workplace travel plans, travel awareness campaigns and marketing strategies to ensure that sole-occupancy car journeys are minimised and sustainable travel is encouraged.
3. **Traffic Management Act:** Through the role of the Traffic Manager, the best possible use of new and existing highway infrastructure will be sought to ensure that congestion is managed and public transport is prioritised in main urban areas.
4. **Information Provision:** To disseminate travel information during or prior to making trips; for example, through travel leaflets, real-time transport information and driver information systems.
5. **Infrastructure:** Where appropriate, additional infrastructure will be sought to cater for the huge levels of growth planned for Essex; for example, additional cycle tracks, bus priority facilities and new carriageway, where necessary.
6. **Land Use:** Influencing development to ensure provision for essential travel movements through the implementation of Sustainable Communities, parking standards and home zones, creating development levies and/or maximising Section 106 contributions from developers to minimise the impacts of transport.



## **4.0 TRANSPORT ISSUES**

### **4.1 Background**

4.1.1 As stated elsewhere, the AQMA in Brentwood are related to two separate types of problem. Six of the AQMA are associated with large trunk roads, the M25 and A12, that are managed by the Highways Agency. Failure to meet the air quality objective is a function of the high volume of traffic allied to the proximity of residential accommodation to these roads. The remaining AQMA is related to a busy town centre junction, the traffic comprising mostly local journeys. However, when there are problems with the A12 or the M25, traffic commonly diverts through Brentwood town centre, exacerbating the situation at this junction.

4.1.2 In purely transport infrastructure terms, these two distinct problems require different answers. However, other strategies which encourage modal shift will be common to both (although most effective with the town centre site). A discussion of the options available is therefore split into three sections; namely:

- Motorway and trunk road AQMA
- Wilson's Corner AQMA
- General issues (including smart or "soft" measures)

### **4.2 Motorway and Trunk Road (M25 and A12)**

Two major road improvement schemes to the M25 are either in the process of being completed or programmed into the Highways Agency Targeted Programme of Improvements.

#### **4.2.1 M25 Junction 28/A12/Brook Street Improvement**

This scheme has recently been completed and became operative in May 2008. Junction 28 is a very busy M25 roundabout junction with the A12 and the A1023 Brentwood feeder road.

The junction itself is an AQMA and a further AQMA is situated just west of the junction (Nags Head Lane). This junction, besides taking high volumes of traffic, is also subject to congestion affecting both long distance national traffic and local traffic. The following key improvements have been made to the junction, designed to relieve congestion:

- Introduction of a dedicated left-hand turning lane from the M25 clockwise exit slip road on to the A12 east bound entry slip road.
- Widening of the A12 east bound entry slip road and additional carriageway widening of the A12 to provide three lanes for approximately 1 kilometre.

- Carriageway widening at the junction: on the A12 London bound exit slip road; on the M25 anti-clockwise exit slip road; and on the roundabout between the A1023 to the M25 clockwise entry slip road.

The scheme is expected to result in reduced congestion at the junction, thereby delivering more reliable journeys, improved safety and environmental improvements.

The Highways Agency undertook a quantitative assessment of the effects of the operation of the scheme on local air quality. For the closest receptors, there was either no change or a slight improvement with the scheme compared with an option of not carrying out the scheme. This may have further knock on improvements for the Town Centre AQMA as there will be less need for traffic to divert away from the strategic network once the scheme is completed.

#### 4.2.2 Junction 27 to 30 M25 Widening

The Highways Agency is proposing to provide an additional lane on both the clockwise and anti-clockwise carriageways on a 25.5 kilometre stretch of the M25 between junctions 27 and 30 (including the section through Brentwood Borough). The scheme is expected to be operational by 2012. An essential part of the sustainable success of the widening schemes would be the management of traffic demand through the use of a suitable traffic demand and control strategy. This Integrated Demand Management (IDM) measure should provide some constraints on induced traffic and lock in benefits from widening by providing for a more managed approach to efficient use of road space.

The Environment Statement concluded that there would be only a very slight deterioration in air quality with respect to nitrogen dioxide and all air quality objectives (and EU limit values) would be met in the opening year. In its Business Plan 2007/08, the HA made a commitment not to progress a major scheme that would worsen the situation overall with regard to compliance with an EU limit value. The widening will include constructing the infrastructure necessary for controlled motorway, which will provide the opportunity for variable speed limits. Variable speed limits as part of Active Traffic Management (ATM) were found to reduce NO<sub>x</sub> emissions by 5% in the M42 ATM trial. An initial post-opening evaluation of traffic data from the M25 Junctions 12 to 15 widening scheme showed that the number of congested peak hours decreased following the widening scheme, with a consequent increase of up to 40% in peak hour speeds, while journey time reliability has also increased. There was little change in traffic flows between J12-14.

#### 4.2.3 General Measures

The Highways Agency will be trialling the use of High Occupancy Vehicle (HOV) lanes in Yorkshire and if successful could be rolled out over other parts

of the network. The effectiveness of catalytic (TiO<sub>2</sub> impregnated) barriers are also being trialled.

The Highways Agency has produced no specific measures to improve air quality associated with the A12, other than to suggest that the mandatory EU limit value of 40µg/m<sup>3</sup> will be met by 2011 due to national measures as a result of a cleaner vehicle fleet.

Measures that would improve air quality are those that would reduce traffic flows, reduce queuing traffic, increase the distance between source and receptor or affect dispersion by employing barriers. The Highways Agency is considering carrying out a study to consider options for this.

If a park-and-ride scheme were to be considered feasible, the HA would also consider the erection of suitable signage along the A12 to encourage drivers to use this facility. Similar signage could also be employed for Shenfield Station but at present this would cause congestion and parking problems at Shenfield, which is a predominantly suburban area not designed for high volume traffic. This option will, however, be discussed later as it is related to the Crossrail proposal which will terminate at Shenfield Station.

The A12 has become a motorway in all but name and demand continues to increase as further development is undertaken east of Brentwood. The Council would therefore urge the HA to seriously consider the installation of an Integrated Demand Management system for the A12, including variable speed limits to allow for the free flow of traffic.

The Council also recognises that, although emissions of NO<sub>x</sub> are projected to reduce over time with the introduction of better engine technology in recent years, this trend has not always converted into a downward trend in NO<sub>2</sub> concentration. The Council therefore encourages the HA to undertake regular assessments of these AQMAs to reassure stakeholders that the hoped for compliance with the air quality standard comes about by 2011. If at any stage it appears unlikely that this prediction will actually come to pass, the Council will encourage the HA to implement those additional local measures among those it has studied in order to achieve the standard at the soonest possible date.

### **4.3 Wilson's Corner**

4.3.1 Wilson's Corner is a double mini-roundabout junction of the A128 and A1023. It is situated at the east end of the High Street in Brentwood town centre. It has four arms to the junction:

- North to Pilgrims Hatch and Chipping Ongar
- West to Brentwood High Street and the M25
- South to Herongate, West Horndon and Grays
- East to Hutton, the A12 and Billericay

When there are problems with the A12 or M25, traffic tends to divert through Brentwood and will inevitably use this junction.

The junction suffers from severe congestion, particularly in the rush hour periods in the morning and later afternoon. The congestion is particularly noticeable during school term time and five schools are located in reasonably close proximity to the junction.

The HDV class vehicles are contributing disproportionately to the NO<sub>x</sub> concentrations, contributing almost 40% of the emissions but being only a small proportion, 5.3%, of the vehicle fleet at this junction. This is comprised predominantly of freight lorries rather than buses or coaches.

4.3.2 A proposal for a large development is currently being prepared for the town centre, along William Hunter Way, and in close proximity to Wilson's Corner. The proposal involves redevelopment of the existing William Hunter Way car park site for a mixed use development comprising multi-screen cinema, retail and residential uses and the creation of a 647 space car park, together with associated works. This will clearly attract further traffic to the town centre of which a significant proportion will access via Wilson's Corner and have an adverse impact on the existing AQMA. There is an opportunity, however, to mitigate and improve the air quality conditions as part of the application, and highways works and/or suitable financial contributions are being proposed as part of a Section 106 Agreement.

4.3.3 The Council, in partnership with Essex County Council, are currently drawing up detailed plans of an agreed and financed High Street improvement scheme. Although the scheme has not been designed specifically to deal with the air quality issue, its purpose is to discourage traffic from the High Street and assist with congestion problems and will thus contribute towards reducing emissions at this point. Together with a number of environmental improvements, there will be a narrowing of the carriageway, shared space and positive signing to encourage HDVs to take alternative routes. Additionally, at the west end of the High Street, land has been acquired to form a left-hand slip road at the High Street/Kings Road junction. This will allow traffic to more easily manoeuvre the junction to access William Hunter Way, which runs to the north of the High Street and avoid Wilson's Corner. There will be future consideration of restricting HGV from the High Street at certain times of the day. These proposals should slightly ease congestion at Wilson's Corner and, more importantly, encourage HDVs away from the junction.

The scheme is programmed to commence later in 2008.

4.3.4 A number of options are being considered for the junction itself. In an ideal world, the junction should be modelled to give a fuller understanding of the traffic flows and the likely effects of any measures under consideration. Extensive traffic surveying would need to be undertaken but the likely cost is about £100,000. If pedestrian movements are taken into account, the likely cost will rise to approximately £250,000.

The junction is constrained on all sides by established buildings and it would not be politically acceptable to demolish any part of this area. Any solution must therefore be within the existing highway space.

All four arms to the junction have pedestrian crossings relatively close to the junction itself. During busy periods, this is preventing traffic from exiting the junction and thus backing up to the roundabout and preventing further traffic from flowing and causing queues in all four directions. A number of engineering options are being considered:-

- i) Reducing lane widths to improve exit capacities
- ii) Delineate the roundabouts by removing the raised circles
- iii) Acquire the ground floor of the building on the west corner of Ongar Road to create a walkway, enabling the pavement to be moved back and more road space to be created (this option is not considered to be very practical or cost effective but is included for the sake of completeness)
- iv) Reduce the green time for pedestrians crossing the Ongar Road pedestrian crossing
- v) Replace the existing pedestrian crossings with PUFIN crossings (pedestrian user friendly intelligent crossing), minimising the number and length of times that traffic is held at a red light.
- vi) Formation of a shared space scheme, including removing all street furniture, with pre-signals to clear the junction out and allow pedestrians free flow. This may well have the effect, however, of merely moving the congestion back from the junction.

4.3.5 Besides the remedies included above, other measures under consideration include:-

- i) An investment in public transport for improvement to bus services, bus shelters, high access kerbs, real time passenger information and other associated improvements.
- ii) A segregated footway/cycleway along Highland Avenue to improve links from the eastern side of Brentwood into the town centre.
- iii) Upgrade the existing pelican crossing to a toucan crossing in order to link in with the above cycle/footway.
- iv) Upgrade the footway to bridleway from Hall Lane to Sawyers Hall Lane to improve access links from the eastern side of Brentwood to the town centre.

- v) Improve the existing Advanced Direction Signs on the approach roads into the town centre.
- vi) Installation of Variable Message Signage within the town centre so that the public are made aware of where parking space is available and minimise unnecessary traffic movements.
- vii) Increase enforcement of the existing 7.5 ton weight limit restrictions.

#### **4.4 General Measures**

##### **4.4.1 Low Emission Zone (LEZ).**

For a local authority as small as Brentwood, the introduction of a LEZ is impractical and not financially viable. However, the Mayor of London has recently introduced a LEZ, the borders of which are effectively at the M25. The LEZ will encourage vehicle operators to clean up their fleet. Diesel HGVs, coaches and buses that fail to meet a minimum pollution standard will be charged to drive within the Greater London Area. The charges are set at a rate to encourage operators to modify or replace high polluting vehicles. From 2010, the heaviest most polluting light goods vehicles (LGV) and minibuses will also be included in the scheme. As HGVs disproportionately contribute to the pollution levels in the AQMA, this measure could also have benefits for Brentwood as many vehicles enter London via the Borough and its AQMAs.

##### **4.4.2 Park and Ride.**

The Council is engaging consultants to consider the feasibility of a park and ride scheme for Brentwood (and possibly Shenfield). The proposed Crossrail scheme - running from Maidenhead through the centre of London with a terminal at Shenfield - will reduce parking at Shenfield during construction and may attract additional rail customers when in operation, increasing demand for parking. This may make the introduction of a park and ride or park and train scheme more viable, although current figures indicate that there would be insufficient demand to justify the cost.

##### **4.4.3 Railways**

Two main line stations are located within the Borough at Brentwood and Shenfield. The line splits at Shenfield, one line continuing to Southend and the other to Colchester and Norwich. Shenfield is an important commuter station into London and there is a non-stopping service to London Liverpool Street, taking as short a journey time as 17 minutes. As mentioned above, this service is likely to be enhanced by the Crossrail scheme.

There is little scope to enlarge rail coverage in the Borough but the Council will promote alternatives to the car, such as rail travel.

##### **4.4.4 Buses**

Clearly, buses provide a more efficient use of road space, as long as they are used sufficiently to prevent empty or near empty buses driving around the

Borough. The Council will therefore promote local bus travel as an alternative to the car. Buses provide good access to the railway stations, most schools and the town centres at Brentwood, Shenfield and Ingatestone.

The High Street improvement scheme includes ducting, etc, to allow for the installation of a bus telematics scheme which will allow bus users to know how long they will have to wait for a particular bus. Parts of the routes have had raised kerbs introduced at bus stops to allow easier access. Free bus passes are given to the elderly. New buses (EURO3) have been introduced on the Transport for London route 498 from Romford into Brentwood. The 73/73A route from Warley to Bishops Hall Estate has recently been enhanced to a 15 minute daytime frequency and an hourly evening service, raised access kerbs, new passenger shelters and real time passenger information. The 351 service is being extended beyond Brentwood via Warley Hill, Pastoral Way, Vaughan Williams Way (serving Beechwood Medical Centre) and Crescent Road.

Improvements are also being considered to the 551 (Basildon to Brentwood) and 81/2 (Brentwood to Hutton) services.

Many of the existing school buses are also open to members of the public including routes from Billericay, Blackmore, Ongar, Kelvedon Hatch, Doddinghurst, Warley, West Horndon and points in between to Brentwood and Shenfield schools.

The Council will encourage Essex County Council to provide funding to introduce telematics and improve bus stops and new buses to existing services.

A Quality Bus Partnership (QBP) is a partnership between county councils, bus operators and sometimes other parties to build on existing services to create a superior bus service experience for customers. This initiative forms part of a wider transportation strategy, building into an overall quality bus service network throughout Essex.

Through QBP's Essex County Council work to implement bus priority measures, waiting restrictions and other traffic management measures along the route and provide a viable and attractive alternative to car usage. This can include improvements to vehicle quality, convenience, infrastructure, frequency and bus priority measures, including real-time information.

Section 106 Agreements are utilised to provide funding for these improvements, where appropriate, and money is available to carry out improvements to the bus service at Brentwood Station. Planning conditions are also being requested for bus passes to be provided by the developer of large schemes to occupiers of their residential developments for a year, to encourage new residents to use existing bus services.

#### 4.4.5 **Travel Plans**

Travel plans can make valuable contributions to reducing individual car use by employees and visitors to organisations such as the Council, hospitals, schools (which are dealt with separately), entertainment complexes and larger employer organisations. They will encourage such things as car sharing and alternative modes of transport. Many developments and organisations are required, as a condition of their planning approval, to draw up, implement, monitor and review such plans. The Council should also be setting an example to others by operating an active travel plan.

The operation of a successful travel plan is also integral to policies designed to reduce carbon footprints. The Council will therefore produce its own travel plan for staff and visitors and encourage large employers and organisations within the Borough to prepare travel plans.

The Council will also revisit all planning approvals which required the successful applicant to provide travel plans, to monitor those travel plans and encourage their continuance.

#### 4.4.6 **School Travel Plans**

All schools will be required to have a School Travel Plan by 2010. It is proposed within the LTP that by 31<sup>st</sup> March 2008, 95% of Essex schools will have Travel Plans in place. All these schools will be encouraged to achieve a reduction in the use of the car and an increase in alternative modes. (This text had been taken from the LTP)

Essex County Council will assist all schools in this process by providing advice and guidance. There is also an incentive for schools to produce a plan as funds are available to them to finance works which they identify as necessary, e.g. shelters, secure bike storage, etc. The plans should include details of current modes of transport to school, together with targets for alternative modes of travel, such as public transport, cycling and walking. It should include details of how these targets might be met. These strategies also assist with the healthy living agenda and the issue of obesity amongst children.

Four schools are situated on Sawyers Hall Lane, just off the Wilson's Corner AQMA. A recent partnership project between the four schools' councils, Brentwood Borough Council and Essex County Council has been initiated whereby Council officials have met with staff and pupils from the schools to talk about air pollution and how it affects them and what they could do to assist.

As a result, the schools are producing travel plans which include ideas to promote and encourage alternative modes of transport, other than the car. The Council is considering these proposals, which include widening of footways, opening up and improving closed accesses, improving existing footpaths and providing safer walking routes with more appropriate pedestrian crossings. The schools have organised pilot 'walking buses' from various locations with the intention of making these permanent features.



#### 4.4.7 **Walking**

The Council supports the aims of the County Council Walking Strategy, which was produced in August 2001. Walking is the most environmentally and socially sustainable form of transport. As such, the Council will take every opportunity to promote the advantages of walking.

Specifically, the Brentwood Town Centre Improvement Scheme will encourage walking as it makes the town centre area more pedestrian friendly and discourages car use.

#### 4.4.8 **Cycling**

In August 2001, Essex County Council issued the Essex Cycling Strategy. This identified that only 2% of residents cycled to work, one of the worst percentages in the county. Following production of this over-arching document, Mouchel Parkman undertook a cycling review of Brentwood in order to determine funding requirements and prioritise schemes for the LTP.

The review issued in October 2006 found that existing facilities for cyclists are generally of a good standard but the network was not comprehensive and lacks integrity. A number of key issues were identified by the review which, if resolved, could lead to significant improvement in the quality of cycling facilities and an increase in use of this transport mode.

The key issues identified by the review are:

- The cycle network does not provide connectivity and direct links with key destinations, such as the lack of penetration to the Town Centre.
- A lack of connection between cycle routes.
- A lack of priority for cyclists at side junctions and crossings of major junctions.
- Issues of personal security related to the physical segregation from the highway and inadequate maintenance of vegetation and lighting.
- Difficulty in navigating the cycling routes due to lack of signing.
- A lack of on-road provision for cyclists and on-road links to residential areas.
- Absence of a coherent cycle route structure

The main recommendations proposed by the review are summarised as follows:

- Implementation of more direct routes
- Development of coherent, named cycle routes

- Improved connectivity with existing routes and key destinations
- Construction of new links
- New directional signage to create a legible cycling environment
- Provision of a new high-quality cycle track to link into existing cycle network provision
- Removal of overgrown vegetation to improve visibility, cycleway widths and lamp column effectiveness
- Lighting upgrades

The Council will revisit the recommendations of the report in the light of the AQMAs and encourage the Highway Authority to give priority to schemes identified within the review. The Council will also use its own resources to promote cycle use as an alternative to road traffic and raise awareness of the existing cycle routes in the Borough.

The Council will also continue to use Section 106 Agreements to facilitate improvements in the cycle infrastructure.

#### 4.4.9 **Freight Management**

At present Essex County Council does not have an adopted Freight Strategy however it is currently working on a draft LGV Strategy (Light Goods Vehicle Strategy) which seeks to improve sustainable distribution by ensuring that goods vehicles are on the correct routes, producing a quality network, reducing congestion and promoting alternative modes. Objectives outlined in the draft document are as follows:

- Provide local infrastructure improvements which serve to facilitate access to local facilities;
- Reduce HGV movements on inappropriate routes;
- Reduce HGV movements on rural roads;
- Prevent HGV traffic from travelling on roads with weight restrictions;
- Minimise the impact of HGV movements on local communities, including overnight lorry parking;
- Enhance road safety;
- Improve facilities where pedestrians and cyclists are adversely affected by lorries; and
- Encourage the use of alternative forms of transporting LGV and in particular by rail and waterway.

#### 4.5 **Other**

4.5.1 As stated earlier, it is inevitable that actions undertaken as part of the Council's climate change agenda will also benefit the aims of this Action Plan. The Council has signed up for the Nottingham Declaration on Climate Change, committing the Council to:-

- Work with central government to contribute at a local level, to the delivery of the UK Climate Change Programme, the Kyoto

Protocol and the target for carbon dioxide reduction by 2010.

- Participate in local and regional networks for support.
- Within the next two years, develop plans with our partners and local communities to progressively address the causes and the impacts of climate change, according to our local priorities, securing maximum benefit for our communities.
- Publicly declare, within appropriate plans and strategies, the commitment to achieve a significant reduction of greenhouse gas emissions from our own authority's operations, especially energy sourcing and use, travel and transport, waste production and disposal and the purchasing of goods and services.
- Assess the risk associated with climate change and the implications for our services and our communities of climate change impacts and adapt accordingly.
- Encourage all sectors in our local community to take the opportunity to adapt to the impacts of climate change, to reduce their own greenhouse gas emissions and to make public their commitment to action.
- Monitor the progress of our plans against the actions needed and publish the result.

4.5.2 The Council will continue to encourage, promote and enable domestic energy savings via its Home Energy Conservation Act programme and our affordable warmth schemes.

4.5.3 The Council will also take every opportunity to promote the objectives of this plan via its website and various other media, such as the Council's free newspaper, Vision.

## 5.0 **IMPACTS AND COSTS**

5.1 It is impractical to carry out a full cost benefit exercise for all the actions that might possibly be undertaken. However, the Action Plan must consider the likely impact of measures on air quality against the possible cost so that cost effectiveness can be assessed. This assessment will also allow different measures to be compared and prioritised. It has to be accepted that there is not a bottomless pit of money available and therefore it is important that valuable resources (both cash and human) are used to achieve maximum possible benefit.

5.2 Not all the actions are easy to compare as some of them have already been agreed and are going ahead whilst there are statutory duties which will be undertaken whether or not this Action Plan exists.

There is also a measure of uncertainty as costs are not always easy to calculate and a quantitative assessment of air quality impacts is both expensive and potentially prone to error. It is very difficult to estimate the effects on air quality of certain measures, especially the "smarter/or" softer" measures such as promotion and education.

5.3 Some of the measures also have other benefits beyond the scope of this Action Plan. These include:-

- Reduction of other pollutants such as particulate matter, benzene, etc.
- Reduction in emission of greenhouse gases.
- Reduced noise from traffic - there is a direct correlation between traffic levels and noise.
- Reduced congestion - many of the air quality problems are actually present as a result of congestion.
- Environmental improvements - some of the measures will have other impacts such as improving the attractiveness of the local environment.
- Economic benefits - making business areas more accessible and increasing employment opportunities.
- Climate change policies - many of these actions will also assist any climate change strategy.
- Improvements in human health.

In order to simplify the cost benefit exercise, costs and impacts have been banded (low, medium and high) using professional judgement and a benefit assessment matrix formed from these two judgements.

The definitions are shown in the tables below:-

Table 3 - Costs Bands

<b>Cost Banding</b>	<b>£</b>	<b>Description</b>
Low (3)	<50k	Cost is covered in existing budget or below £50,000.
Medium (2)	50k-200k	Additional funding is required
High (1)	>200k	Significant amount of extra funding required

Table 4 - Air Quality Impact bands

<b>Air Quality Banding</b>	<b>Definition</b>
Low (1)	Impact is small and localised. Will be beneficial as part of a wider measure.
Medium (2)	Impact is considered important with benefits clearly seen.
High (3)	Impact is considered significant and the action is considered necessary to achieve the objectives.

Table 5 - Cost Benefit Assessment Matrix

<b>Cost x Impact = Effectiveness</b>	<b>High Impact (3)</b>	<b>Medium Impact (2)</b>	<b>Low Impact (1)</b>
High Cost (1)	3	2	1
Medium Cost (2)	6	4	2
Low Cost (3)	9	6	3

## 6.0 ACTION PLAN AND IMPLEMENTATION

The table below summarises various actions that constitute the Action Plan. They include actions which are already being undertaken and will continue, as well as actions which may not proceed because they have little benefit and other actions which will only proceed if funds become available.

Action	Who	When	Cost	Air Quality Impact	Cost Benefit Assessment	Wider Impacts	
A) Measures which are part of the Council's ongoing air quality management							
1.	The Council will continue to monitor air quality within the Borough via its real time NO <sub>x</sub> monitoring station and NO <sub>2</sub> diffusion tubes (currently at 37 locations)	EH	Ongoing	3	1	3	Provision of accurate data assists with a greater understanding for the benefit of residents and allows for a long-term assessment of the impacts of any actions.
2.	The Council will consider extending or relocating the existing NO <sub>2</sub> diffusion tube survey locations to monitor air quality 'hot spots'	EH	Ongoing	3	1	3	Informs future development proposals and provides additional data.
3.	Consider extending the monitoring network and/or carrying out further air quality monitoring in areas associated with major new developments. (Costs may be met by developer via S106 Agreement)	EH	Ongoing	3	1	3	Informs future planning conditions and the effectiveness of mitigation measures taken as a result of a major new development which has a significant impact.
4.	Raise the profile of air quality in the Borough (probably in conjunction with climate change issues) using the Council website, newspaper, leaflets and the media.	EH CS-MAP	Ongoing	3	1	3	Raises the profile of the Council and partner organisations.
5.	Support the London Low Emission Zone recently implemented by Transport for London and provide advice as appropriate to vehicle operators within the Borough.	EH	Ongoing	3	2	6	Improved health of residents. Will contribute towards climate change objectives. Promote new technologies and retro-fitting of pollution reduction devices. Extra costs to business.

Action		Who	When	Cost	Air Quality Impact	Cost Benefit Assessment	Wider Impacts
6.	Promote alternative methods of transport such as walking, cycling, buses and trains.	EH CS-MAP	Ongoing	3	1	3	Benefits to the environment and health.
7.	Develop a green travel plan for the Council covering getting to and from work and use of vehicles for Council business.	BBC/ECC	2008/09	3	2	6	Contributes towards climate change agenda. Sets an example to other employers within the Borough and encourages wider good practice.
8.	To encourage existing large employers to produce and implement suitable travel plans.	EH ECC	Ongoing	3	1	3	Reduced congestion, health and environment benefits.
9.	To assist schools in producing their travel plans and make them aware of air quality issues.	ECC EH	Ongoing	3	1	3	Improved health, reduced congestion.
10.	To continue with the Sawyers Hall Lane schools air pollution project.	EH ECC	Ongoing	3	1	3	Improved health and well being, reduced congestion. Improved educational knowledge.
11.	Urge Essex County Council and other bodies, such as Sustran, to implement the recommendations detailed in the Brentwood Town Cycling Review of October 2006.	Via LTP revision process	2008	2	2	4	Reduced congestion. Improved health.
12.	Encourage ECC to produce a Freight Management Strategy.	ECC	2008	3	2	6	Reduced congestion, noise plus health and environment benefits.
13.	Quality Bus Partnership Contribute towards the existing partnership arrangement.	ECC BBC	Ongoing	3	1	3	Encourages modal shift.

Action		Who	When	Cost	Air Quality Impact	Cost Benefit Assessment	Wider Impacts
14.	Continue to require developers to contribute towards the costs of infrastructure improvements and mitigation of adverse air quality impacts, where appropriate, via Section 106 Agreements.	HoP	Ongoing	1	3	3	Benefits will obviously vary according to the development and the nature of the contribution.
15.	Require potential developers to carry out air quality assessments as part of the planning process, should their development impact on AQMAs or significantly impact on areas close to being determined as AQMA.	HoP	Ongoing	1	3	3	Benefits will obviously vary according to the development and the nature of the contribution.
16.	Consider offering residents with electric/hybrid cars free/reduced residents' permits and free/reduced entry into Council car parks.	HoSC&WM	2008/09	3	1	3	Encourage take-up of electric cars. Noise reduction.
17.	Continue to contribute towards the Essex Air Quality Consortium and assist ECC with jointly promoting awareness of air quality issues.	EH ECC	Ongoing	3	1	3	
<b>B) Measures which form part of the Highways Agency management function.</b>							
18.	Junction 27 to 30 M25 widening scheme	HA	2012	1	N/A	N/A	This proposal has been identified as having a negative effect on air quality. Reduced congestion and economic benefits and reduced noise.
19.	Installation of Integrated Demand Management along the M25.	HA	2012	1	2	2	To be installed as part of the widening scheme. Will also assist in reduced congestion and economic benefits.
20.	Both BBC and ECC to urge the Highways Agency to review the operation of the A12 between the M25 and Chelmsford and in particular the introduction of an IDM scheme, including variable speed limits.	EH & ECC	2008 onwards	1	2	2	Reduced congestion and economic benefits.



<b>C) Higher priority measures for Wilson's Corner</b>							
21.	Implement the Brentwood High Street Improvement Scheme.	ECC	2008/09	3	2	6	Improved environment, health and economic benefits. N.B. Low cost as funding already in place
22.	Consider a scheme to restrict the movement of HGVs in the vicinity of Brentwood High Street.	HoSC&WM ECC	2009	3	2	6	Reduced congestion - negative effect for High Street business?
23.	Replacing the existing four pelican crossings at Wilson's Corner junction with PUFIN crossings.	ECC	2008	1	3	3	Reduced congestion and economic benefits. Improved health and environment.
24.	Urge ECC to consider other physical improvements that could be implemented at the Wilson's Corner junction.	EH ECC	2008	2	2	4	Reduced congestion and economic benefits. Improved health and environment.
25.	Consider forming a footway/cycleway along Highwood Avenue and upgrading the pelican crossing at its junction with Ongar Road.	ECC	2010	2	2	4	Improved health and environment benefits.
26.	Consider upgrading the footway from Hall Lane to Sawyers Hall Lane.	ECC	2010	3	2	6	Improved accessibility, health benefits, encourage walking/cycling to school.
27.	Consider improving the Advanced Direction Signs on the approach roads to the town centre.	ECC	2010	3	1	3	Reduced congestion.
28.	Installation of variable message signage within the town centre.	ECC	2010	2	1	2	Reduced congestion - reduces unnecessary vehicle movements.
29.	Where appropriate, impose planning conditions to require developers to provide bus passes for new residents.	HoP	Ongoing	3	1	3	Increased accessibility. Reduced congestion.
30.	Ensure that existing planning conditions regarding travel plans are enforced.	HoP	Ongoing	3	1	3	Reduced congestion, health and environment benefits.

Action		Who	When	Cost	Air Quality Impact	Cost Benefit Assessment	Wider Impacts
<b>d) Lower priority measures</b>							
31.	Consider periodic exhaust emission surveys.	EH	Ongoing	2	1	2	Reinforce the link between poorly maintained cars and pollution. Public attitude might not be supportive.
32.	The Council to investigate the further greening of its existing fleet and to consider air pollution as a factor when procuring extra or replacement vehicles and investigate the availability of grants.	HoSC&WM	2008/09	3	1	3	Contributes towards climate change agenda. Sets an example to other fleet operators.
33.	The Council to carry out a feasibility study of the costs, benefits and practicality of introducing a park-and-ride (or park and walk) scheme for Brentwood/Shenfield.	BBC	2009/10	2	3	6	This would have the potential to reduce traffic levels in the town and hence noise levels, improved environment and health benefits. Negative effect on business?
34.	Carry out a full modelling exercise of vehicle and pedestrian movements at Wilson's Corner and model potential improvement options.	ECC	If funds permit	1	2	2	The modelling itself would have no impact on air quality but it would verify the success or otherwise of potential schemes. However, the high cost may be prohibitive.
35.	Consider further investment in bus services.	Via QBP	ongoing	1	2	2	Improved accessibility. Reduced congestion.
36.	Encourage ECC to introduce telematics at bus stops on main bus routes in the town, together with improvements to bus stops and bus fleet.	EH & ECC	2008/09	2	2	4	Increased accessibility. Reduced congestion.
37.	Investigate the setting up of Freight Quality Partnership, Taxi Partnership and Low Emission Zones.	BBC/ECC Trade Bodies	2010	1	3	3	Contributes towards climate change agenda

## **7.0 DETAILED CONSIDERATION OF ACTION PLAN OPTIONS**

The options detailed in the previous section are of a diverse nature, are not exhaustive, have varying costs and benefits and are consequently of varying practicalities.

However, they do encompass seven main areas:

- Air quality management
- Infrastructure measures at Wilson's Corner
- Infrastructure measures on the trunk routes
- Personal modal shift
- Business modal shift
- Planning controls
- Regulation of freight emissions

Although a number of options have been produced for each of these areas they rely on resources, both human and financial, to deliver them. In most cases, therefore, contact needs to be made with other relevant bodies to agreed detailed actions once the principle of improvement has been determined.

The following draft actions have therefore been produced to start debate and agree actions which are practical, affordable and have a good prospect of delivery.

Measure	Title
1	<b>Air Quality Management</b>
Definition	Key Intervention
Routine monitoring of NO <sub>2</sub> levels in existing AQMAs and other areas, including background levels.	Provision of information to enable an assessment of progress and review of the strategy.
Responsible authority and other potential partners	Powers to be used
1. Brentwood Borough Council (Env Health) 2. Highways Agency	Environment Act 1995 requires the Council to undertake reviews of air quality.

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Continue real time monitoring								Date received	N/A
2 Continue diffusion tube monitoring								Date received	N/A
3 Monitor levels at Brook Street roundabout and M25								Monitoring carried out	N/A

Notes
1) and 2) above are already being undertaken but requires ongoing funding to continue. For 3) above, BBC will request Highways Agency to monitor levels along the M25 to confirm that their prediction of future levels is correct.

Measure	Title
<b>2</b>	<b>Infrastructure Measures at Wilson's Corner</b>
Definition	Key Intervention
<p>To investigate physical measures that can be undertaken at Wilson's Corner which will decrease congestion and pollution levels, including:</p> <ul style="list-style-type: none"> <li>• implementation of the High Street Improvement Scheme</li> <li>• replacement/modification of pedestrian crossings</li> <li>• improved pedestrian &amp; cycle access</li> <li>• improved signage</li> </ul>	Measures to address the high pollution levels in this town centre AQMA implemented via the LTP
Responsible authority and other potential partners	Powers to be used
Essex County Council Brentwood Borough Council	Voluntary, although Government Guidelines recommend such measures where road traffic is the dominant cause of high pollution levels.

Actions	Implementation timetable								Progress indicator	Target
	09	10	11	12	13	14	15	16		
Simple description of tasks	When the tasks will be completed								What will be monitored	What the intervention aims to achieve
1 Formation of steering group										
2 Prepare draft LTP									Revised draft document	
3 Publish new LTP									New document	

Notes
The High Street Improvement Scheme is programmed to start in 2008 and finance is in place.

Measure	Title
<b>3</b>	<b>Infrastructure Measures on the Trunk Routes M25 and A12</b>
Definition	Key Intervention
Installation of integrated demand management along the M25.  Consideration of IDM and variable speed limits on the A12	Reduced congestion which in turn reduces pollution levels and minimises the number of occasions that vehicles leave the M25/A12 and travel through Brentwood
Responsible authority and other potential partners	Powers to be used
Highways Agency Brentwood Borough Council	Government Policy

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Retain contact & liaison with H.A.									N/A
2 Consult with HA over mitigation measures for 4 lanes of M25								Mitigation measures agreed	NO <sub>x</sub> levels to fall in line with HA predictions
3 Lobby HA to carry out improvements to the A12								Letters to HA	NO <sub>x</sub> levels to fall in line with HA predictions

Notes
The HA claim that levels will fall to below the mandatory limit value by 2011 due to national measures and the Council would wish to confirm that this prediction proves to be correct (see also measure 1).

Measure	Title
4	Personal Modal Shift
Definition	Key Intervention
Programme of promoting personal travel via: walking, cycling, public transport and use of low emission vehicles	Encourage modal shift to reduce vehicle use and lower emissions
Responsible authority and other potential partners	Powers to be used
Brentwood Borough Council (Env Health & Communities & Customer Care) Essex County Council	Voluntary (although also assists other issues such as climate change, personal health, etc)

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Form a steering group									N/A
2 Produce strategy for promoting transport other than the motor car								Production of strategy	N/A
3 Raise awareness of air quality								Reduces use of cars at Wilson's Corner at peak times	10%
4 Deliver a programme of promoting walking, cycling etc									
5 Review the cycle strategy and increase the number of cycle routes								Number of km of cycle routes	Double the 2008 base

Notes
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Measure	Title
5	Business Modal Shift
Definition	Key Intervention
To promote travel plans within:- <ul style="list-style-type: none"> <li>the local authority</li> <li>community facilities such as schools</li> <li>other large employers</li> </ul>	Encourage modal shift to reduce vehicle use and lower emissions
Responsible authority and other potential partners	Powers to be used
Brentwood Borough Council Essex County Council	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Formation of steering group									N/A
2 Produce strategy for promoting travel plans								Production of strategy	N/A
3 Develop a green travel plan for the Council								Document	N/A (Reduce mileage by 10% 2012 15% 2013 20% 2014)
4 Implement strategy for the Council								Amount of business mileage	
5 Target schools									
6 Target businesses									

Notes
The air quality schools project being undertaken with schools in the proximity of Wilson's Corner will continue.



Measure	Title
6	Planning Controls
Definition	Key Intervention
<p>Maximise the amount of Section 106 mitigation works for significant developments to adversely impact on AQMAs</p> <ul style="list-style-type: none"> <li>consider other relevant planning conditions to meet sustainability good practice</li> <li>Ensure existing planning conditions regarding travel plans are enforced</li> </ul>	Local planning policies reviewed to mitigate adverse air quality impacts of new development
Responsible authority and other potential partners	Powers to be used
Essex County Council (Transport Planning) Brentwood Borough Council (Planning Department)	Existing planning powers

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Set up a liaison group with Planning Dept								N/A	N/A
2 Review existing policies								Document	N/A
3 Implement amendments, additions of policies									
4 Review existing travel plans required by historic planning conditions								Number of organisations with active travel plans	

Notes
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Measure	Title
7	Regulate Freight and Bus Emissions
Definition	Key Intervention
To negotiate commitment from local freight and bus operatives to improve the emissions standards of their fleet or reduce emissions in other ways. As appropriate to work with local and regional bodies in the implementation of a Freight Strategy.	Improved emissions standards on vehicles which contribute disproportionately to existing emissions
Responsible authority and other potential partners	Powers to be used
Brentwood Borough Council Essex County Council Local freight and bus operators	Local transport powers

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
Simple description of tasks	When the tasks will be completed							What will be monitored	What the intervention aims to achieve
1 Form a steering group, including local operatives	■							N/A	N/A
2 Develop baseline inventory		■						Document	
3 Develop plan to reduce emissions			■					Document	
4 Implement plan			■	■	■	■	■	No. of vehicles meeting good emissions standard	Euro V for HDVs by 2014
5 Compliance							■		100%

Notes
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## **8.0 CONSULTATION AND STAKEHOLDER ENGAGEMENT**

- 8.1 This Action Plan is intended to be a dynamic document which will clearly develop with time.

For this plan to be successful, it is essential that the main stakeholders, Brentwood Borough Council, Essex County Council and the Highways Agency, work together to implement the most cost effective measures for the Community and to further develop the Plan.

Essex County Council and the Highways Agency have been fully consulted in the preparation of this document.

This Plan will also be incorporated within other strategies and plans within the Council.

- 8.2 The Plan will be subject to an annual review, appraisal of progress and reporting to the relevant Council Panel.
- 8.3 This document will be subject to a full public consultation as well as the statutory consultants detailed in statute.
- 8.4 The Action Plan has been produced by:

Brentwood Borough Council  
Environmental Health Service  
Town Hall  
Ingrave Road  
Brentwood  
Essex CM15 8AY

Any comments should be addressed to Richard Farr, Principal Assistant Environmental Health Officer at the above address, by telephone on 01277 312504 (fax 01277 312526) or by email on [richard.farr@brentwood.gov.uk](mailto:richard.farr@brentwood.gov.uk). This document can also be viewed on the Council's website: <http://www.brentwood-council.gov.uk>.

## Acknowledgements

The Council would like to acknowledge the help and input of the following in compiling this Action Plan:

Gwyn Jones	AEA Technology plc
Katherine Fox-Boudewijn	Environmental Information Officer
Peter Rose	Chief Engineer - Brentwood Borough Council - Essex County Council
Hanna Rowe	Senior Transport Planner - Essex County Council
Nicola Keable	Principal Transportation Co-ordinator - Essex County Council
Geoff Boyton	Principal Planner - Brentwood Borough Council
Amber Randlesome	Strategic Development Engineer - Essex County Council
Brian Pitkin/ Tajinder Sangha	Highways Agency
Simon Rudge	Traffic Control and Information Systems Specialist - Essex County Council
Richard Bailey	Senior Transport Development Specialist - Essex County Council
	To be completed

## **References**

Local Air Quality Policy Guidance LAQM.PG(03) – DEFRA

Air Quality Action Plans: Interim Guidance for Local Authorities - NSCA (New Environmental Protection UK)

Air Quality: Planning for Action – NSCA

Addendum to LAQM Guidance LAQM.PGA(05) – DEFRA

Guidance on Local Transport Plans - Department of Transport

Development Control: Planning for Air Quality - NSCA and 2006 Update – NSCA

Essex Local Transport Plan 2006/2011 - Essex County Council

Essex Cycling Strategy - Essex County Council

Essex Walking Strategy - Essex County Council

Brentwood Replacement Local Plan – Brentwood Borough Council 2005

**National Air Quality Objectives and European Directive Limit and Target Values for the Protection of Human Health**

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter
<b>Sulphur Dioxide</b>	UK	266 $\mu\text{g.m}^{-3}$ not to be exceeded more than 35 times per year	15 minute mean	31 December 2005		
	UK	350 $\mu\text{g.m}^{-3}$ not to be exceeded more than 24 times per year	1 hour mean	31 December 2004	350 $\mu\text{g.m}^{-3}$ not to be exceeded more than 24 times per year	1 January 2005
	UK	125 $\mu\text{g.m}^{-3}$ not to be exceeded more than 3 times per year	24 hour mean	31 December 2004	125 $\mu\text{g.m}^{-3}$ not to be exceeded more than 3 times per year	1 January 2005
<b>Benzene</b>	UK	16.25 $\mu\text{g.m}^{-3}$	Running annual mean	31 December 2003		
	England and Wales	5 $\mu\text{g.m}^{-3}$	Annual average	31 December 2010	5 $\mu\text{g.m}^{-3}$	1 January 2010
<b>1,3-butadiene</b>	UK	2.25 $\mu\text{g.m}^{-3}$	Running annual mean	31 December 2003		
<b>Carbon Monoxide</b>	UK	10 $\text{mg.m}^{-3}$	Maximum daily running 8 hour mean/in Scotland as running 8 hour mean	31 December 2003	10 $\text{mg.m}^{-3}$	1 January 2005
<b>Lead</b>	UK	0.5 $\mu\text{g.m}^{-3}$	Annual mean	31 December 2004	0.5 $\mu\text{g.m}^{-3}$	1 January 2005
		0.25 $\mu\text{g.m}^{-3}$	Annual mean	31 December 2008		

Air Quality Objectives and Pollutants

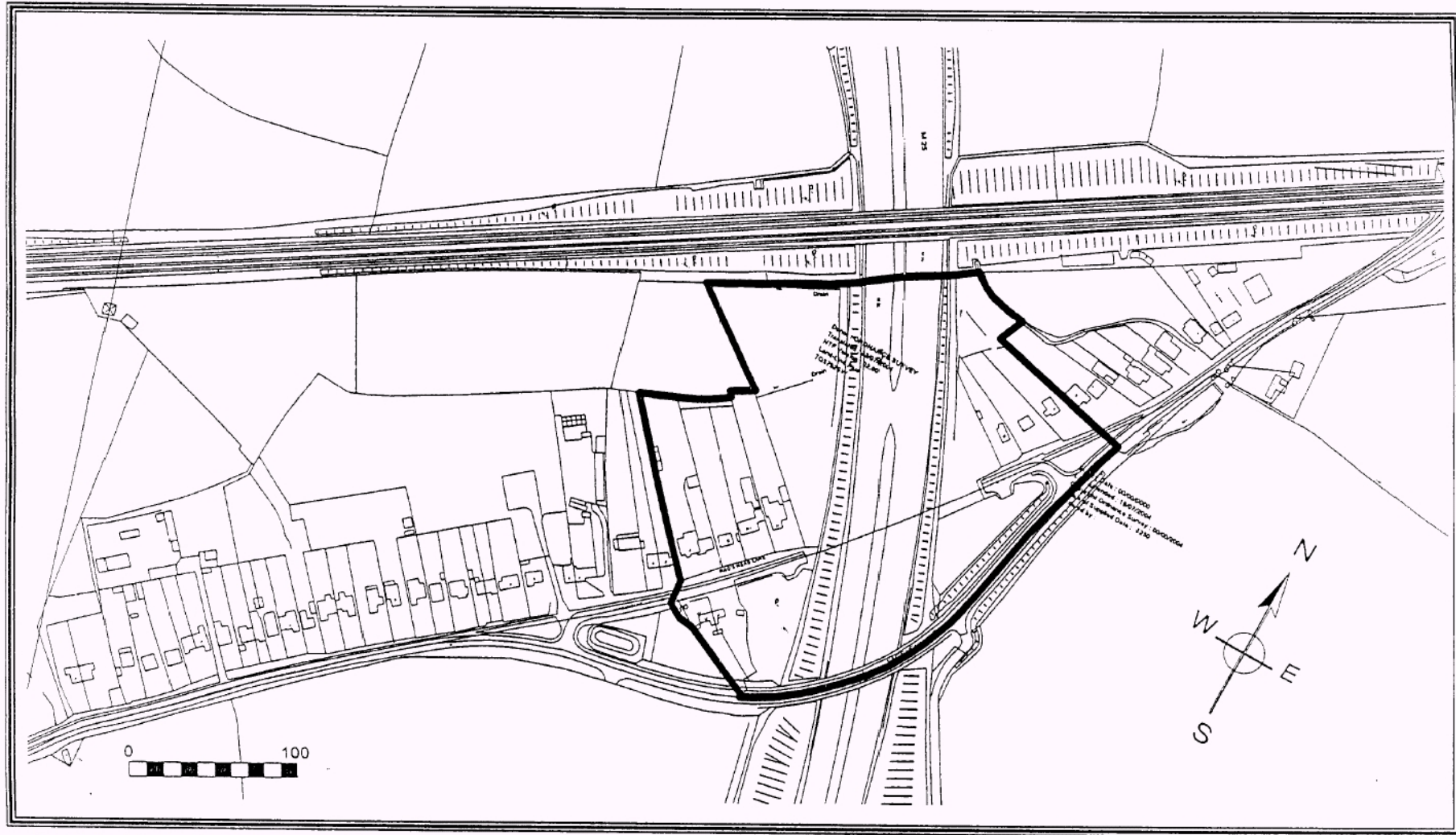
**APPENDIX 1**

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter
<b>Particles (PM<sub>10</sub>)</b>	UK	50µg.m <sup>-3</sup> not to be exceeded more than 35 times per year	24 hour mean	31 December 2004	50µg.m <sup>-3</sup> not to be exceeded more than 35 times per year	1 January 2005
	UK	40µg.m <sup>-3</sup>	Annual mean	31 December 2004	40µg.m <sup>-3</sup>	1 January 2005
	Indicative 2010 objectives for PM <sub>10</sub> (from the 2000 Strategy and 2003 Addendum) have been replaced by an exposure reduction approach for PM <sub>2.5</sub>					
<b>Nitrogen Dioxide</b>	UK	200µg.m <sup>-3</sup> not to be exceeded more than 18 times per year	1 hour mean	31 December 2005	200µg.m <sup>-3</sup> not to be exceeded more than 18 times per year	1 January 2010
	UK	40µg.m <sup>-3</sup>	Annual mean	31 December 2005	40µg.m <sup>-3</sup>	1 January 2010
<b>Ozone</b>	UK	100µg.m <sup>-3</sup> not to be exceeded more than 10 times per year	8 hour mean	31 December 2005	Target of 120µg.m <sup>-3</sup> not to be exceeded more than 25 times per year averaged over 3 years	31 December 2010

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland  
(Volume 1)

Maps of Air Quality Management Areas

**Air Quality Management Area BRW1 M25/Nags Head Lane Junction**



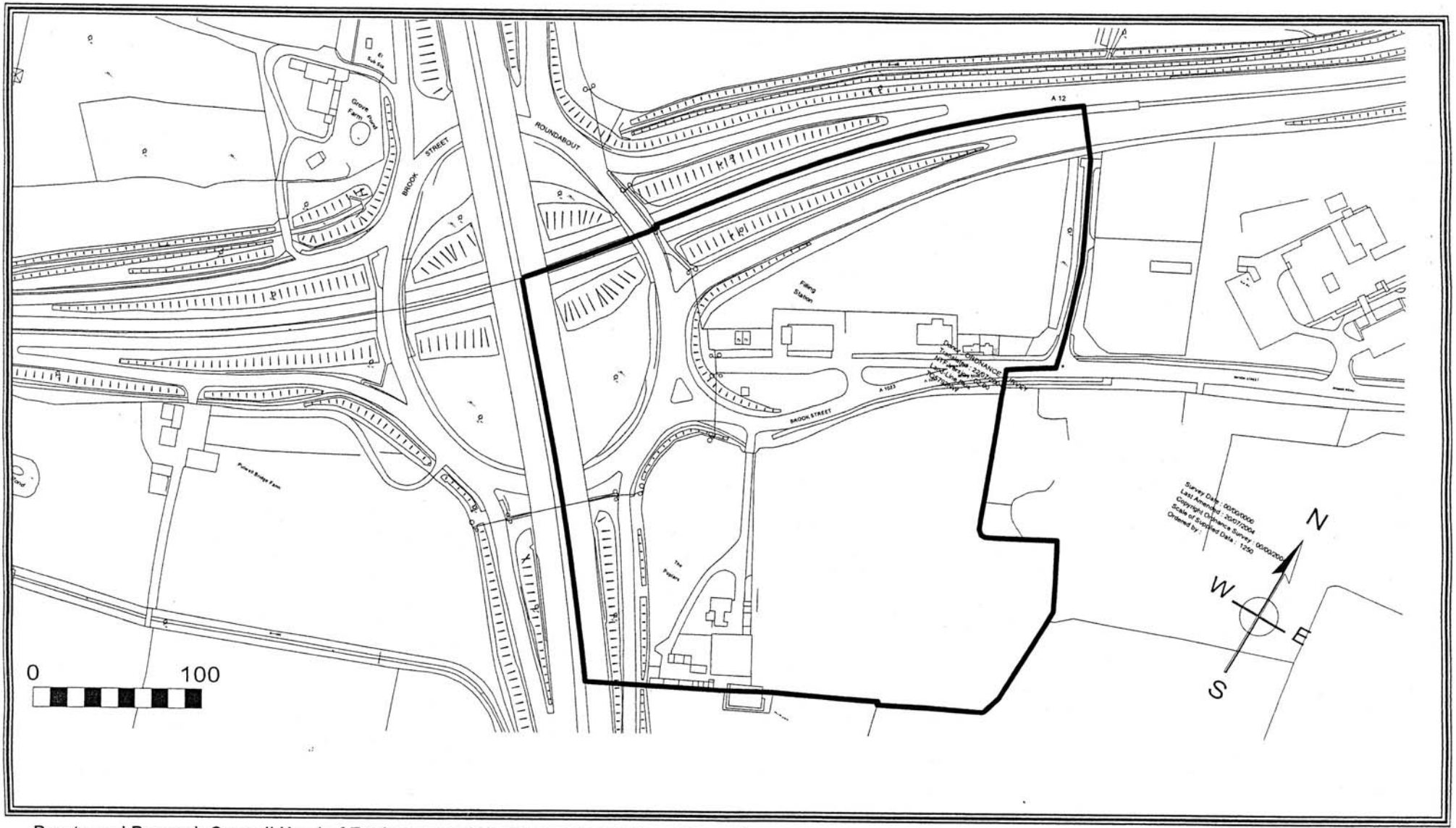
Brentwood Borough Council Head of Environmental Health and Recreational Open Space

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January 2005



**Proposed Air Quality Management Area BRW2 M25/A12 Brook Street roundabout**

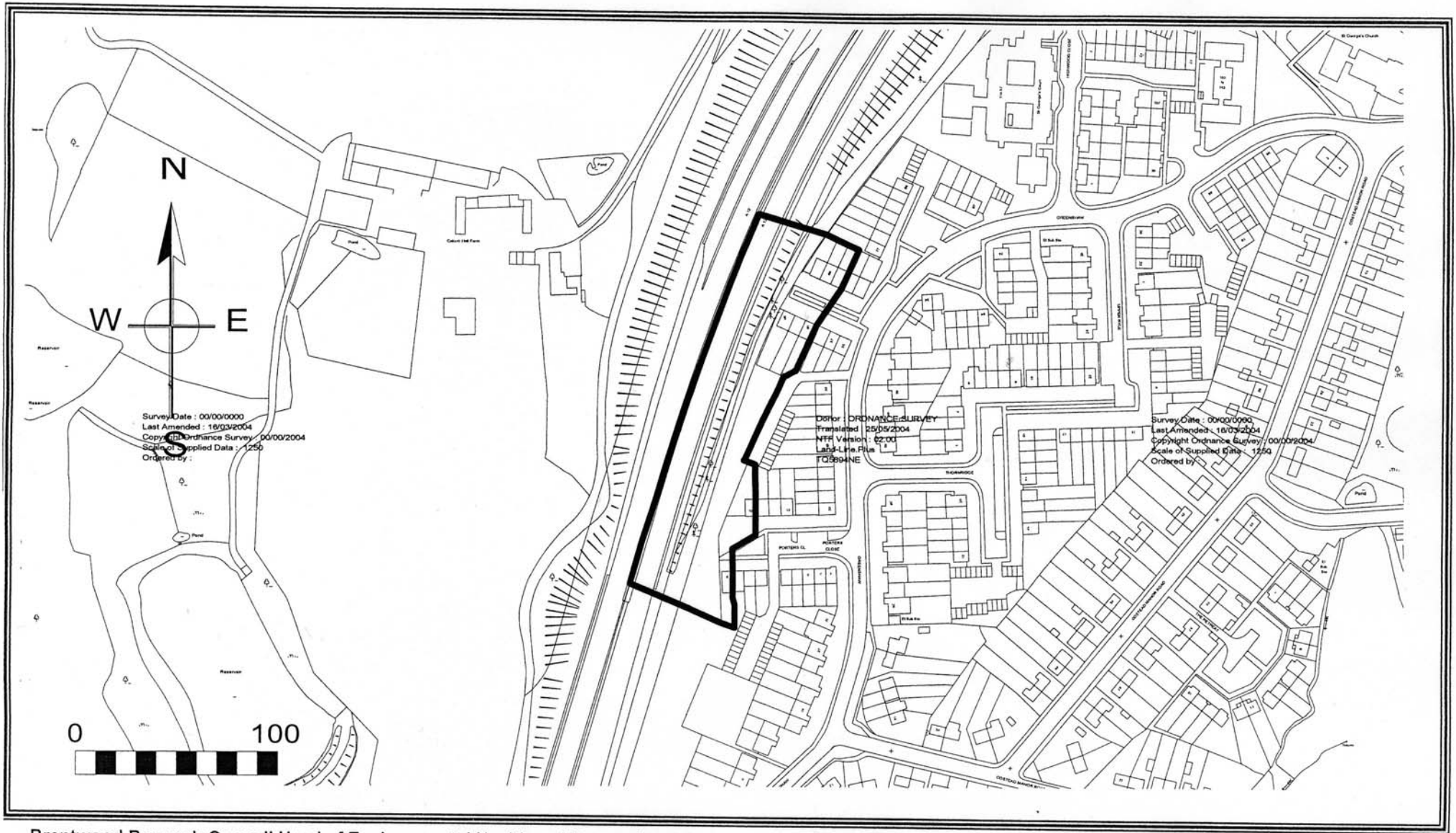


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October 2004

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# Proposed Air Quality Management Area BRW3 A12/Greenshaw and Porters Close

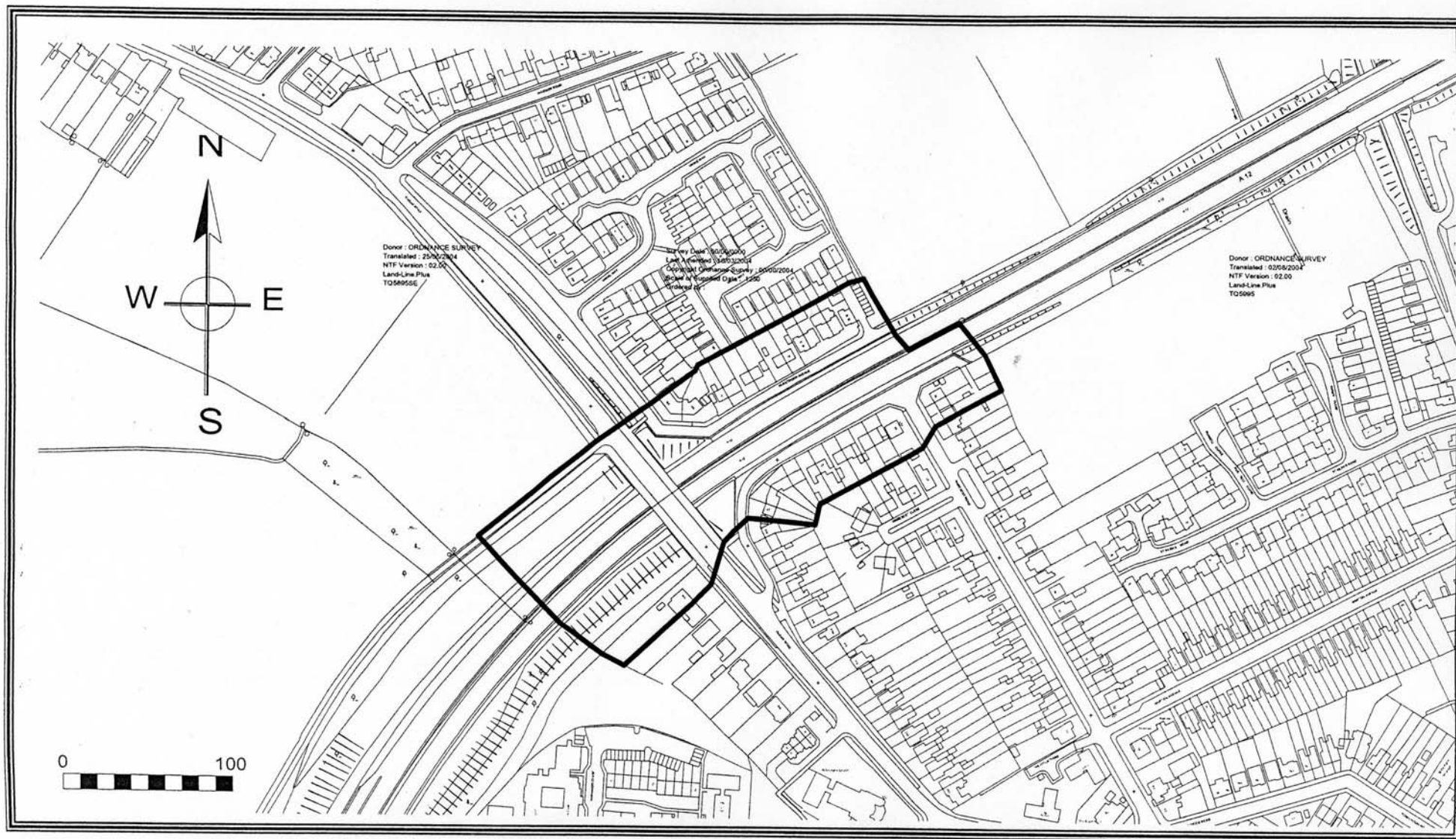


**Brentwood Borough Council Head of Environmental Health and Recreational Open Space**

**October 2004**

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# Proposed Air Quality Management Area BRW4 A12/Warescot Road/Hurstwood Avenue/Ongar Road

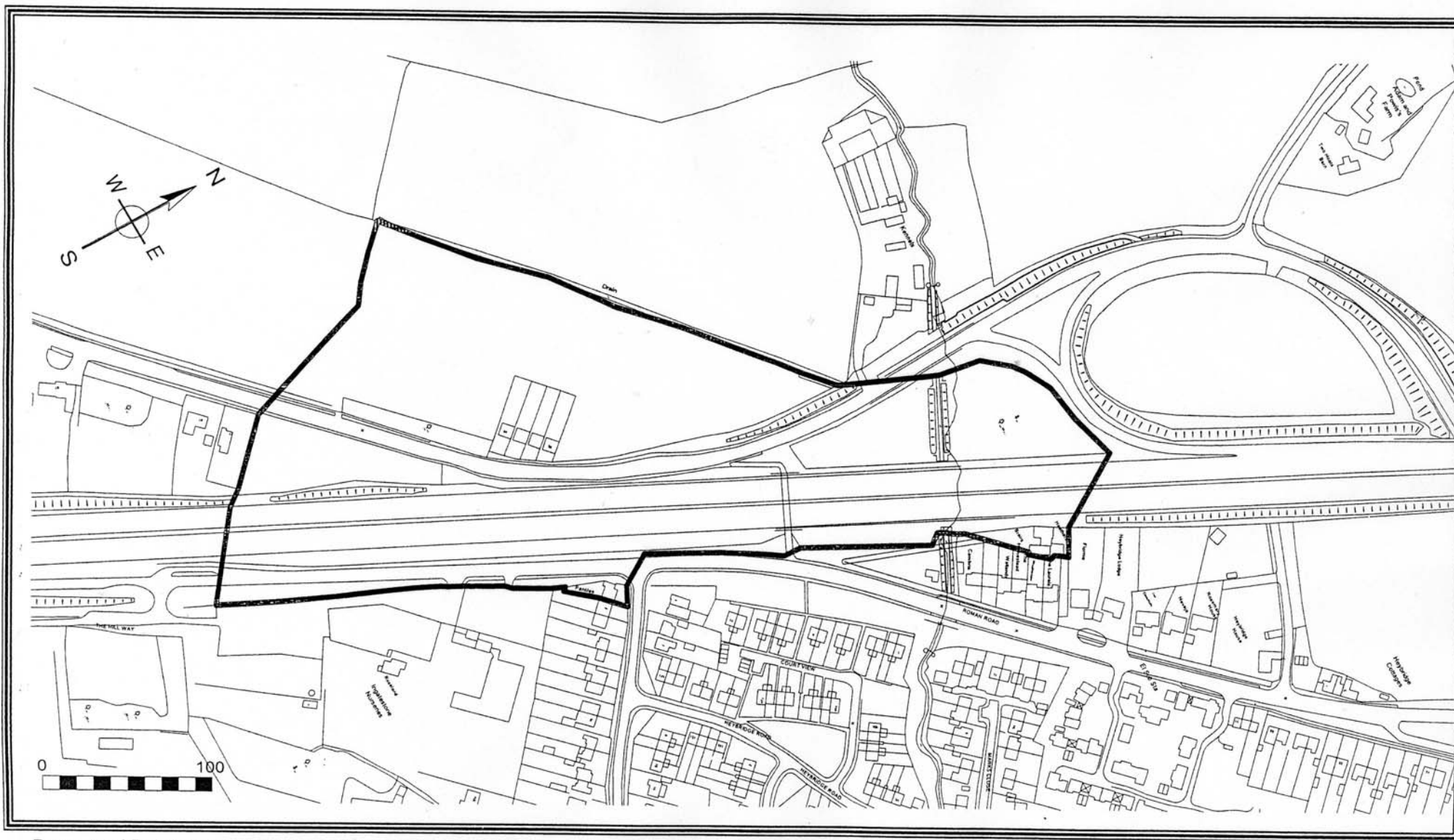


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# Proposed Air Quality Management Area BRW5 A12/Roman Road Mountnessing



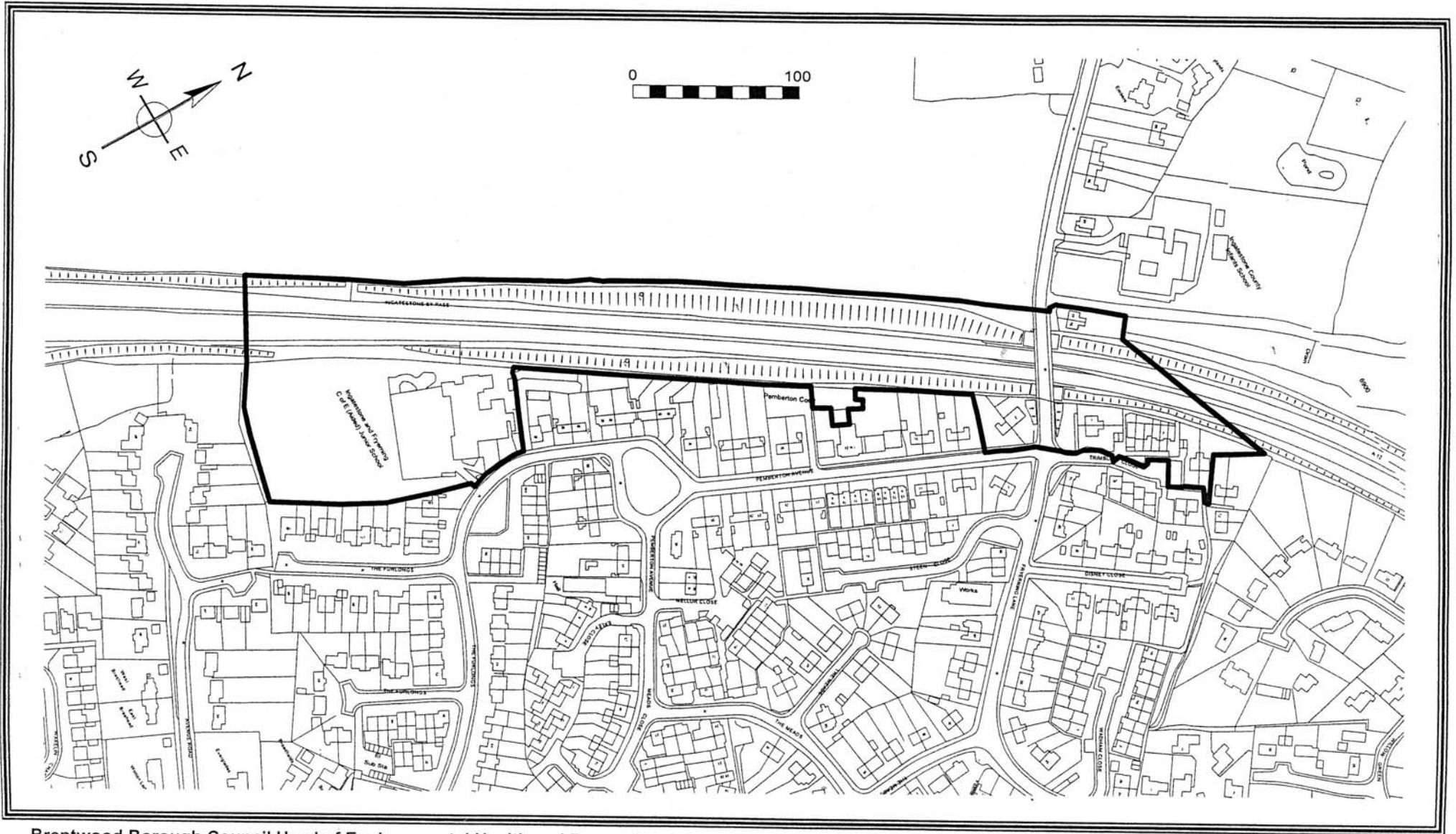
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# Proposed Air Quality Management Area BRW6 A12/Fryerning Lane, Pemberton Avenue, Trimble Close

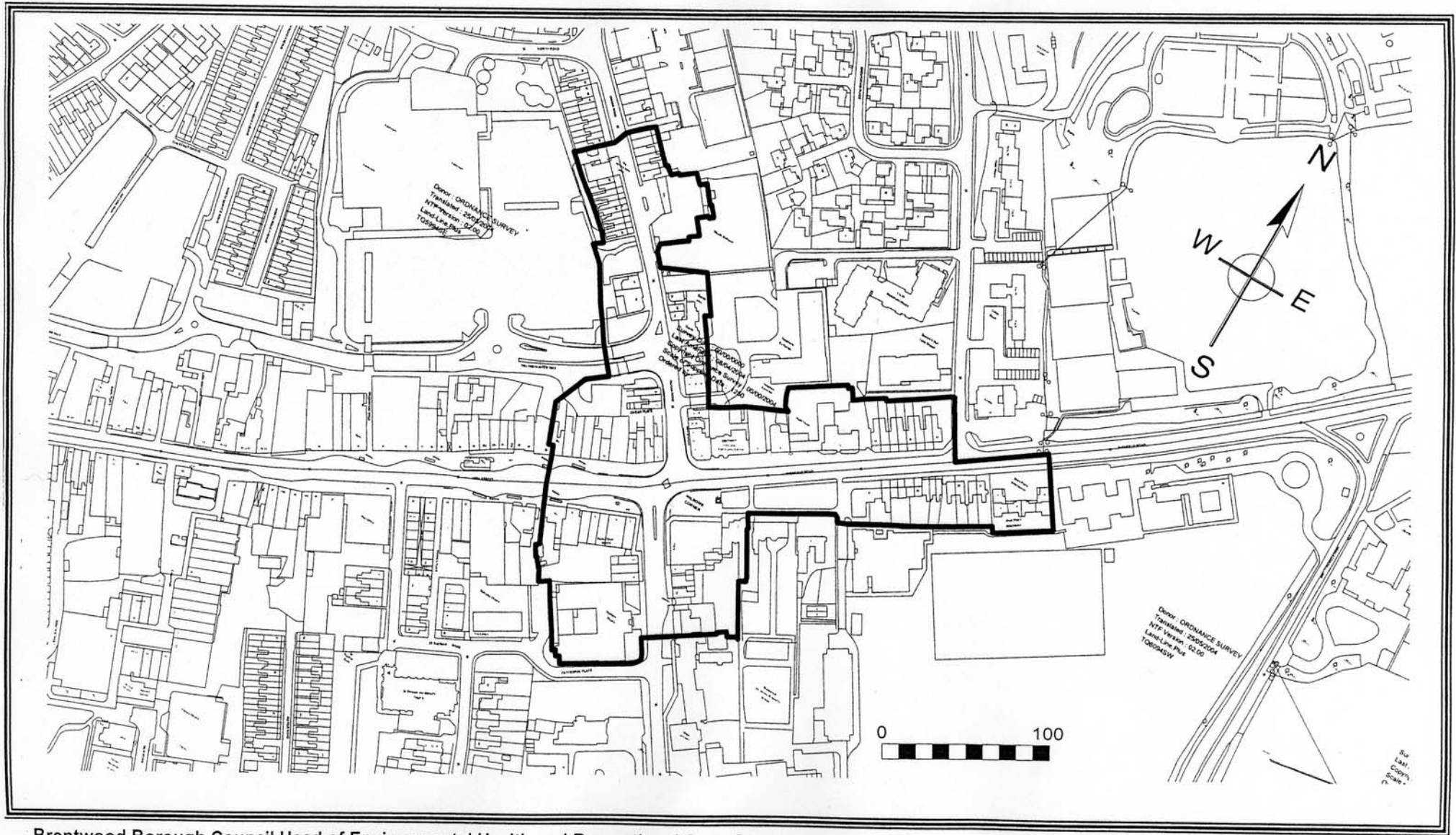


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# Proposed Air Quality Management Area BRW7 A128/A1023 Junction (Wilson's Corner)

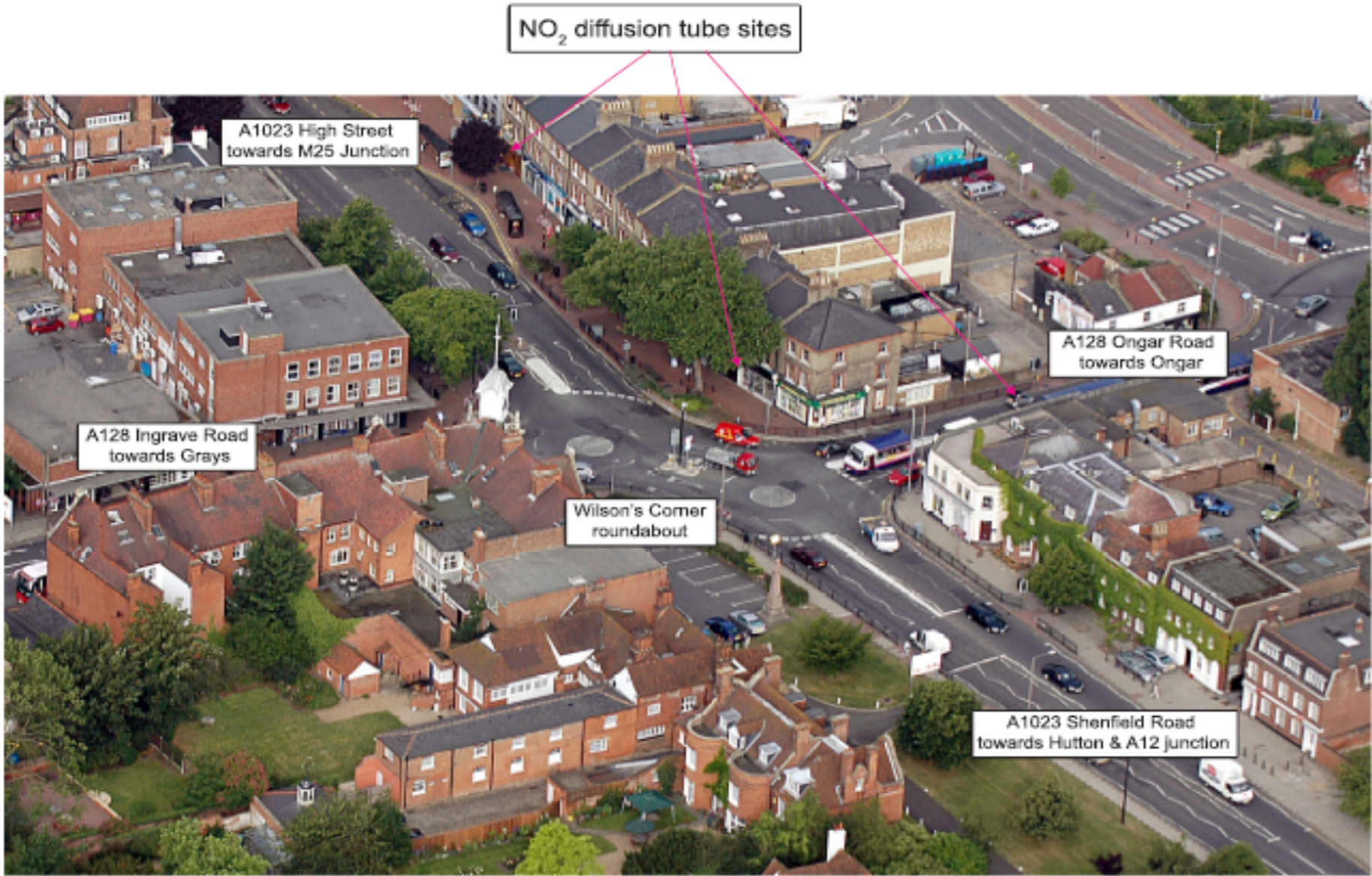


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**Aerial view of Wilson's Corner, Brentwood**