



Air Quality Action Plan

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Executive Summary

In 1995 the Government published the Environment Act which introduced initiatives for the protection of air quality in the UK. It uses health-based standards to control the levels of seven designated pollutants. It requires local authorities to conduct reviews and assessments and to identify the locations within their areas where the standards for pollution levels are 'not likely' to be met. If as a result of the review process, it appears that the air quality objectives are not, or are unlikely to be achieved in any area within the boundary of the local authority – then the local authority shall by order designate it as an 'Air Quality Management Area' (AQMA). Once such an area has been designated a more detailed assessment of the air quality shall be conducted.

In January 2001 North West Leicestershire District Council completed its Stage 3 review and assessment of air quality for the district. The purpose of the assessment was to determine whether the objectives set by the government for the seven pollutants, considered as being of most concern to public health and as detailed in the National Air Quality Strategy would be achieved. The seven pollutants are benzene, 1,3-butadiene, lead, carbon monoxide, nitrogen dioxide, particulate matter (PM₁₀) and sulphur dioxide. As a result 6 AQMAs were declared in North West Leicestershire District Council, as the review and assessment predicted exceedences of the annual mean objective for nitrogen dioxide (40µgm⁻³).

In March 2004 Northwest Leicestershire District Council completed its Stage 4 review and assessment of air quality within its AQMAs. The Stage 4 report concluded that the annual mean objective for nitrogen dioxide will not be met within two of the AQMAs but the objective will be met within the remaining four AQMAs and elsewhere throughout the district. Four of the AQMAs were subsequently revoked, the boundaries of the M1 AQMA were re-defined and the A6 AQMA in Kegworth remained unchanged.

This report details Northwest Leicestershire District Councils Air Quality Action Plan developed to assist in the delivery of the UK's air quality objectives for NO₂ within the two remaining AQMAs.

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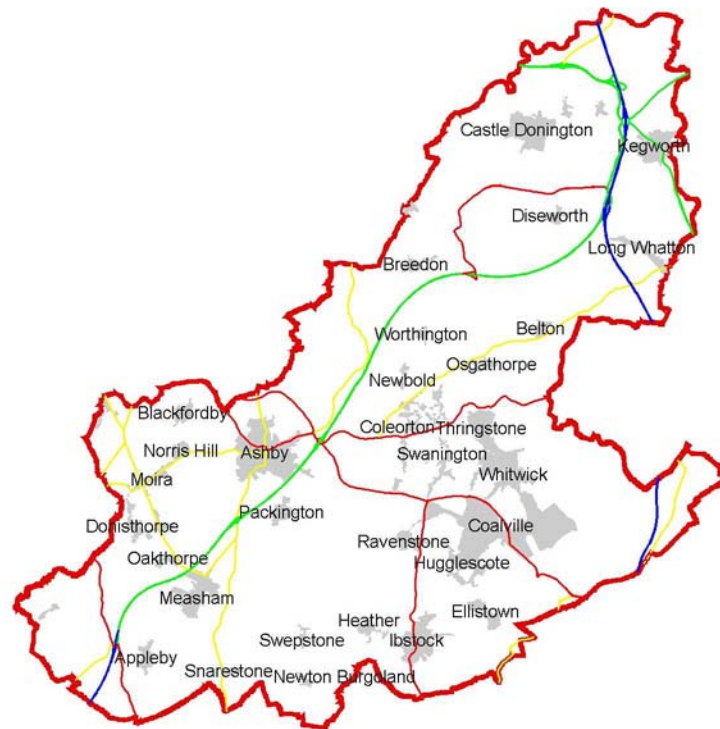
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1. INTRODUCTION

1.1 Description of the District



North West Leicestershire lies in the East Midlands Region and is both the name and geographical location. The District is situated in the heart of the National Forest lying between Leicester, Burton-on-Trent, Derby and Nottingham, and covers 105 square miles. The district is mostly rural with a large extent of industry both historically from coal mining, and more recently with Nottingham East Midlands Airport and large opencast mines and quarries. The population of 88,800 mainly live in the principle towns of Coalville and Ashby-de-la Zouch, and within the large villages of Castle Donington, Kegworth and Ibstock. Three established main roads run through the District the M42/A42 between Birmingham and Nottingham, the M1 and the A50/A511 from Leicester to Burton-on-Trent.

1.2 Purpose of the Action Plan

Good air quality is essential for our health, quality of life and the environment. Concern over the effects of modern day pollution, primarily from road transport sources and industry, has led to the introduction of the EU Directive on Air Quality.

This has been adopted by the UK in the form of the Environment Act 1995 and led to the Government's National Air Quality Strategies of 1997 and 2000. The strategy brought about a change in the way local

air quality is managed. All local councils are required to review and assess air quality in their areas through a process known as Local Air Quality Management (LAQM).

The Air Quality Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 prescribe pollutant specific air quality objectives to be achieved by certain dates specific to each pollutant, ranging from 2003 to 2010. Local authorities have to consider the present and likely future quality of the air up to these dates, and to assess whether these objectives will be met. Eight key pollutants have to be considered and are detailed in Appendix 1.

If as the result of the review process, it appears that the air quality objectives are not, or are unlikely to be achieved in any area within the boundary of the local authority – then the local authority shall by order designate it as an ‘Air Quality Management Area’ (AQMA). Once such an area has been designated a more detailed assessment of the air quality (Stage 4 Review and Assessment) shall be completed within 12 months of declaration of the AQMA. Based on the findings of the Stage 4 assessment, air quality Action Plans to reduce the air pollution should then be developed.

The Action Plan should contain scenarios to improve air quality within the AQMAs. It should also contain a summary of the air quality improvements that might be possible for each of the scenarios identified. The Action Plan should also contain simple estimates of the costs and feasibility of implementing those scenarios in the Action Plan, for example, reductions in road traffic accident deaths as a result of road improvements that also reduce vehicle emissions. The Local Authority can then identify which of the scenario(s) offer the most cost effective or cost-beneficial way of improving air quality.

1.3 Aims and Objectives

Air Quality Action Plans ultimately provide the mechanism by which local authorities in collaboration with national agencies and others, will state their intentions for working towards the air quality objectives through the use of powers they have available.

The overall aim of the Action Plan is to attempt to minimise the effects of air pollution on human health. The Action Plan should include all measures proposed by the Council to improve air quality and should be wider in geographical scope than the area of any air quality hotspot which may be its focus;

North West Leicestershire District Council’s Action Plan has been divided into 3 general areas:

- Direct actions upon the M1 and A453 (Highways Agency has full control over the M1).

- Direct actions upon the A6 (Leicestershire County Council have full control over the A6).
- Actions that will benefit the AQMA and also contribute to improving air quality throughout the whole district. These comprise of numerous projects and initiatives that the council will be able to feed into or implement. The council also has more control over these actions and sees them, as ways to ensure that other areas of the District do not become AQMA's.

The objectives of North West Leicestershire District Council's Action Plan are therefore as follows: -

1.3.1 Primary Objective

- To achieve the National Air Quality Strategy objective for nitrogen dioxide (NO₂) within North West Leicestershire District Council's Air Quality Management Areas.

1.3.2 Secondary Objectives

- Reduce air pollution as a whole within the district.
- Provide up to date information on air quality within the District.
- Ensure that all Council activities are considered with reference to their effect upon air quality.
- Ensure that North West Leicestershire District Council along with the County and other surrounding District Councils encourages a uniform approach to air quality management across Leicestershire.
- To support National initiatives to improve air quality.

2. THE SITUATION IN NORTH WEST LEICESTERSHIRE DISTRICT COUNCIL

2.1 Monitoring and Assessment Work Completed

Following national guidance, assessment of pollutant levels in North West Leicestershire District Council has been carried out in four stages, each one informing the next as to the pollutants of concern and areas where problems were anticipated. The third and fourth stages required detailed dispersion modelling of emissions from sources including road traffic, industry and domestic and commercial sectors. Air quality data collected at sites within the District was used to validate the analysis and predictions were made as to the likelihood of the Government's air quality objectives being met.

North West Leicestershire District Council completed a Stage 3 Review and Assessment, '*Air Quality Review and Assessment, Final Report, January 2001*', which indicated that exceedences of the objective for annual mean nitrogen dioxide (NO₂) were likely at several locations within the district. Six AQMAs were declared in April 2001. A further review and assessment of air quality has been conducted within the six AQMAs, for further detail reference should be made to '*Air Quality Review and Assessment, Stage 4*', *December 2004*'. As a result of this report four of the six AQMAs were undeclared on 19th July 2004. The remaining AQMAs are detailed below and in Figures 4.1 and 5.1 and Table 2.1.

It is worth noting that North West Leicestershire District Council's two remaining AQMAs are situated in the north of the district in the vicinity of Nottingham East Midlands Airport and Donington Race Circuit. Junctions 23A, 24 and 24A of the M1, which provide links to a number of strategic roads, including the A50, A42 and the A6, running through Kegworth, dominate the transport infrastructure. Due to the influences above, together with the proximity of the area to the three cities of Leicester, Nottingham and Derby, there are significant development pressures, particularly around junction 24 of the M1.

North West Leicestershire District Council is required to prepare an Air Quality Action Plan, as specified under Section 84 of the Environment Act, 1995. This report represents North West Leicestershire District Council's Air Quality Action Plan

Table 2.1 AQMAs within North West Leicestershire District Council

Air Quality Management Area	Description
Vicinity of M1	Molehill Farm, in the vicinity of M1 and A453
Kegworth A6	Residential properties with frontages within 10m of the kerb of A6

2.2 Existing Policies to Improve Air Quality

Policies at a number of levels already have significant effects, both positive and negative, on air quality in the District. This Section identifies the most important of these with respect to North West Leicestershire District Council's Action Plan. To ensure a joined up approach and a better chance of success North West Leicestershire District Council's Action Plan needs to be developed in conjunction with these policies.

2.3 National and European Policy

The main areas of national policy with an effect on air quality in addition to the air quality strategy are:

- The 10 year transport plan.
- The Integrated Pollution Prevention and Control (IPPC) regime which has shared enforcement roles by Environment Agency and local authorities.
- Various other EU Directives on specific types of industrial plant, such as large combustion processes and waste incinerators.
- EU legislation on emissions from vehicles (the Euro I, II, III and V standards) and on fuel quality.
- Energy and Climate Change policy, for example, implementation of the UK's obligations under the Kyoto Protocol.
- The EU Noise Directive.

As road traffic is the largest source of NO_x emissions relevant to the Action Plan, the European legislation for more restrictive controls on emissions is of particular relevance. Emissions from individual vehicles will continue to decline as a result of this legislation beyond the 2005 objective for NO₂ and the 2010 deadline for the European legislation. It should be noted that although emissions from individual vehicles is expected to decline, it does not necessarily follow that emissions from the whole fleet will decline, as this may be offset by the number of vehicles on the roads and the total distance driven each year.

In a number of cases there are opportunities for significant benefits between these policies and improved air quality. The Noise Directive is particularly relevant to the area surrounding M1 in North West Leicestershire because of the high volume of traffic using the road network. Likewise the Climate Change policy should benefit air quality across the District, particularly as energy efficiency controls are implemented, for example, Building Regulation Standards for new build and property conversions.

2.4 Local Policies

Several local plans and policies already contain actions that are relevant to air quality including:

- The Central Leicestershire's Local Transport Plan (the LTP), developed by Leicestershire County Council.
- The Leicestershire Community Strategy, which now includes elements of 'Ways Forward for a Better Leicestershire'.
- Leicestershire County's Local Agenda 21 Action Plan.
- North West Leicestershire District Council Community Strategy.

2.4.1 Local Transport Plan

Traffic is the dominant source of pollution within the District and the reason for the AQMAs. Therefore, the LTP could play a prominent role in delivering improved air quality in North West Leicestershire District Council's AQMAs. Local Transport Plans are produced every 5 years, with the current LTP runs from 2001 to 2006. Leicestershire County Council is evaluating how it can assist implementation of action plans through the development of the next round of LTPs. The second round, (LTP2), will cover the five-year period from 2006/07 to 2010/11 and will be submitted in July 2005. The LTP2 guidance states "where air quality management areas (AQMA) have been designated due to emissions from motorways or other trunk roads, the Department of Transport (DfT), invites local authorities to describe them in the local transport plan, and describe briefly any joint work with the Highways Agency to implement the solutions".

2.4.2 The Community Strategy

The Local Government Act 2000 requires every local authority to develop a community strategy. North West Leicestershire have brought together public, private, voluntary and community organisations to form a local strategic partnership to develop the strategy. The strategy has four main themes, one of which being making North West Leicestershire an attractive place to live and work. Under this theme the council undertakes monitoring of air quality around Nottingham East Midlands Airport.

2.5 The Multi-Modal Study

The Government's 10 Year transport plan – 'Transport 2010- The Ten Year Plan' – was announced on 20th July 2000. It sets out the Government's long-term strategy for delivering a quicker, safer, more reliable and environmentally friendly transport system, setting out what can be achieved over the next 10

years. Full details of the report can be found on the Department of Transport, Local Government and the Regions website – www.dft.gov.uk.

Multi-Modal studies form an important part of the Government's 10-year strategy. Of these, the 'North/South Movements on the M1 corridor in the East Midlands March 2002' considers the development of a long-term strategy for the M1 corridor (junctions 21 – 30) and the A453 corridor (M1 to Nottingham). The study has produced long-term strategies for the M1 and the A453 corridors aimed at improving road, rail and other public transport links.

After considering this Multi-Modal study the Transport Secretary Alistar Darling announced on 10th December 2002 a billion-pound package, which supports the findings of the study, some of which may improve the air quality in North West Leicestershire District Council as detailed below:

- Improvements at the M1 Junction 24 and links between A453 and A50.
- A bypass for Kegworth – The Leicestershire County Council has been asked to develop more detailed proposals for the Kegworth bypass and submit appraisals and funding bids to the Department of Transport in due course.
- A package of measures on the M1, including road widening, junction improvements and the provision of crawler lanes.
- The reopening of the Castle Donington Railway Line, to have a local and airport feeder role.

2.6 North West Leicestershire District Council's Influence on Local Air Quality

Although North West Leicestershire District Council is required to develop an Air Quality Action Plan it does not have direct control over some important pollutant sources associated with the possible exceedance of the air quality objectives.

For example, the atmosphere in North West Leicestershire District includes pollutants generated from other parts of Leicestershire, other parts of the UK and Europe. These can contribute a significant amount of the NO_x present in the atmosphere.

With regards to the sources within the AQMAs, the roads are under the control of the Highways Agency including motorways and other major trunk roads, and the Leicestershire County Council retains control over other major roads.

Therefore, in developing the Air Quality Action Plan for the AQMAs it will be essential that there are strong links with other bodies and organisations. This will include, Leicestershire County Council who are responsible for the development of the Local Transport Plan, the Highways Agency, Land Use Planners and other stakeholders. This will help secure reductions in emissions from sources outside direct control of North West Leicestershire District Council. Likewise, North West Leicestershire District Council will need to be kept informed of progress with any currently agreed plans that could have a major positive or negative impact on air quality, and future plans.

3. SOURCES OF AIR POLLUTION WITHIN NORTH WEST LEICESTERSHIRE DISTRICT

In the UK, air pollutants come from a range of sources. These include transport, (mainly from road traffic), industry, energy and natural sources.

3.1 Nitrogen Dioxide (NO₂)

Nitrogen dioxide is formed to a small extent directly in combustion processes. However, most nitrogen based combustion products are emitted as nitric oxide (NO). Nitric oxide is relatively unstable and is rapidly oxidised to nitrogen dioxide in air. Nitrogen dioxide and nitric oxide are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce NO_x emissions, largely in the form of nitric oxide, which is converted to nitrogen dioxide, mainly as a result of reaction with ozone in the atmosphere. It is nitrogen dioxide that is associated with adverse effects upon human health. The principal source of nitrogen oxides is road transport, which accounted for about 49% of total UK emissions in 2000. The contribution of road transport to nitrogen oxides emissions has declined significantly in recent years as a result of various national policy measures and further reductions are expected up until 2010 and beyond. Other significant sources of nitrogen oxides emissions include the electricity supply industry and other industrial and commercial sectors, which accounted for about 24% and 23% respectively in 1999.

The principal health effects of nitrogen dioxide relate to impaired lung performance from changes in structure and function and suspected hyper reactivity to allergens (causes of allergic responses). Effects are reversible; however, ongoing exposure may lead to poorer lung function later in life. Exposure to high concentrations for short periods is considered more toxic than low concentration exposure for long periods.

Road traffic however is the major source of air pollution in North West Leicestershire District Council and it was the reason for the declaration in 2001 of the six original AQMAs and remains the reason for the existing two AQMA's being retained. Although more localised pollution also results from other sources, such as, small industrial processes, construction, quarrying and aviation; the overriding source of nitrogen dioxide is from road vehicle emissions and is the reason for declaration of the AQMAs. It is also worth noting that any improvements of a technological nature which impact on NO_x emissions (Euro I, Euro II engines etc) will have a significant effect on levels of nitrogen dioxide for 2005 and beyond. Hence, measures in this Action Plan will concentrate on reducing transport emissions as these form the greatest percentage in terms of source.

3.2 Carbon Monoxide (CO)

Carbon monoxide (CO) is a colourless and odourless gas consisting of one carbon atom and one oxygen atom. It is largely produced due to the incomplete combustion of fuels containing carbon. The main source of emissions in the UK is road transport, which accounted for 67% of the total releases in 2000. Current projections indicate that road transport emissions will decline by a further 42% between 2000 and 2005.

Carbon monoxide is best known as a pollutant in restricted areas with poor ventilation – in particular domestic houses with badly maintained gas fired appliances where it can reach dangerously high concentrations. These sources only contribute 6% of the total CO generated in the UK. Similarly CO is only a significant pollutant in the wider environment near to heavily trafficked or congested roads. Concentrations fall away rapidly with distance from roads and CO is only therefore a pollutant of concern in the immediate vicinity of its production.

At high levels of CO, prolonged exposure can lead to death as it inhibits the distribution of oxygen around the body by blocking the carrier molecule in red blood cells. At lower levels the effect, whilst not fatal, can lead to impaired mental performance and coronary stress. Short term exposure causes reversible effects whilst long term exposure may lead to chronic health effects.

3.3 Particulate Matter (PM₁₀)

Particulate matter in the atmosphere is composed of a wide range of materials of various origins. Particulate matter with an aerodynamic diameter of 10µm or less is referred to as PM₁₀.

There are a range of emission sources of PM₁₀ concentrations in the UK, which can be divided into 3 main categories. *Primary particulate emissions* derived directly from combustion sources, including road traffic, power generation, industrial processes. *Secondary particles* formed by chemical reactions in the atmosphere, and comprise principally of sulphates and nitrates. *Coarse particles* comprising of a wide range of sources, including re-suspended dusts from road traffic, construction works, mineral extraction processes, wind blown dusts and soils, sea salt and biological particles.

In recent years, an association has been established between fine particles which includes PM₁₀'s, and respiratory or cardiovascular ill-health, asthma and mortality.

3.4 Health Implications of Air Pollution

In the UK, air pollutants originate from a range of sources including transport, industry, energy production and the use of natural sources. The Government's Air Quality Strategy and the Expert Panel on Air Quality Standards (EPAQS) have identified 8 key pollutants as detailed in Appendix 1.

Within the North West Leicestershire District Council's area work is ongoing to reduce the levels of nitrogen dioxide within the two remaining statutory declared AQMA's. Most of the initiatives to reduce nitrogen dioxide will also have positive reductions on the other air pollutants particularly PM₁₀.

3.5 Source Apportionment

As part of the Stage 4 Report (July 2004), a rudimentary source apportionment exercise was conducted. Source apportionment is the process whereby the contributions from individual sources of pollution are determined. In local air quality terms, the relevant sources could include traffic, industrial, commercial and domestic activities etc. Having identified the most important source or sources, options can then be identified, considered and assessed to reduce the individual contributions of pollutants to ambient concentrations.

A detailed emissions inventory for North West Leicestershire District Council was compiled at Stage 3 Review and Assessment (January 2001), which included point sources (industrial and commercial buildings), line sources (roads and the runway at Nottingham East Midlands Airport) and area sources (areas of housing). Data was collected or calculated for time varying emissions of NO_x, PM₁₀, SO₂ and VOCs. Full details of the scope of the inventory can be found in Section 2.4 of North West Leicestershire District Council's Stage 3 Air Quality Review and Assessment 2001. This information is not repeated in detail here, except where supplementary information is required.

The ADMS-Urban Dispersion Computer Model has been used to determine the relative contribution of key pollutants within the Emissions Inventory (tonnes/year) for North West Leicestershire District Council (Table 3.1).

Table 3.1 Relative contributions of key pollutants for North West Leicestershire District Council

Source	NO _x		NO ₂	
	2002	2005	2002	2005
Grid	122.243	122.243		
Point	16.9875	16.9875	2473	2.47338
Road	3038.16	2346.9	226874	175.255
Runways / Taxiing etc	56.8	56.8	4.24	4.24
Takeoff (volume)	1.6	1.6	0.24	0.24
Total	3177.391	2486.131	229347	178

Emissions of nitrogen oxides (NO_x) emissions mainly consist of nitric oxide, which is then converted to nitrogen dioxide in a series of oxidation reactions in the atmosphere. Nationally the principal source of nitrogen oxides is road transport, which accounted for 49% of the total UK emissions in 2000. It is predicted that emissions from road traffic in North West Leicestershire District Council will account for 92% of NO_x in 2005, which is significantly above the national average. This provides a clear indication that where an AQMA is declared for NO₂ road traffic is highly likely to be the cause.

By examining the emissions inventory more closely, the relative proportions of heavy and light vehicles within the fleet can be determined as detailed in Table 3.2.

Table 3.2 Source apportionment within the traffic fleet

	Heavy (HGV and Buses)	Light (Cars and LGV)
Percentage contribution to road traffic emissions: whole network	12	88

The above rudimentary source apportionment exercise provides an indication of the traffic fleet that will be effecting the levels of NO₂ throughout the district in 2005. It is worth noting that HGVs generally only make up between 5% and 12% of the vehicles in the AQMAs, however it is recognised that they have a larger impact regarding air quality, which will be of significance when developing Action Plans.

3.5.1 Source Apportionment for the M1 AQMA

The findings of rudimentary source apportionment exercise conducted within the Stage 4 Report are shown below in Table 3.3.

Table 3.3 Source Apportionment within the M1 AQMA

	AQMA	Heavy (HGV and Buses)	Light (Cars and LGV)
Percentage contribution to road traffic emissions	Vicinity of M1 (Molehill Farm)	19	81

3.5.2 Source Apportionment for the Kegworth AQMA

The findings of the rudimentary source apportionment exercise conducted as part of the Stage 4 Report are shown in Table 3.4.

Table 3.4 Source Apportionment within Kegworth (A6) AQMA

	AQMA	Heavy (HGV and Buses)	Light (Cars and LGV)
Percentage contribution to road traffic emissions	Kegworth A6	12	88

Although cars and LGVs show a higher contribution to the road traffic than HGVs and buses it is recognised that HGVs have a larger negative impact regarding air quality, which will be of significance when developing Action Plans. Nitrogen Dioxide emissions from Nottingham East Midlands Airport are not expected to contribute significantly to emissions within the Kegworth (A6) AQMA (Department for Transport, 2002).

3.5.3 Summary of Source Apportionment

- The primary source of NO_x emission in North West Leicestershire District Council is from road traffic.
- NO_x emissions from point and area sources in North West Leicestershire District Council have a relatively small impact on NO₂ levels within the district.

4. AQMA 1: M1

4.1 Conclusions of the Stage 4 Report

Monitoring and computer modelling work, conducted within the M1 motorway AQMA as part of North West Leicestershire District Council's Stage 4 Report, concluded:

'Based on current findings it is recommended that the receptor locations in the vicinity of tubes 19, 20, 21 and 22 be removed from the original AQMA and the AQMA as a whole being reduced and re-defined as detailed in Figure 4.1. This will allow a clear focus on the hot spot locations and provide a better indication of where resources need to be allocated in terms of equipment and overall effort.'

The new boundaries of the retained M1 AQMA are depicted in Figure 4.1. The AQMA is shown by the pink shaded area and contains one residential property known as Molehill Farm (depicted by the red line). The other buildings indicated on the map, within the AQMA, non residential i.e. farm-buildings and workshops. It should be noted that the quality of the air in this AQMA is primarily affected by traffic using the M1 but also by traffic using the A453 the Ashby Road into the village of Kegworth and Nottingham East Midlands Airport air traffic contribution. This is considered in further detail in Chapter 5.

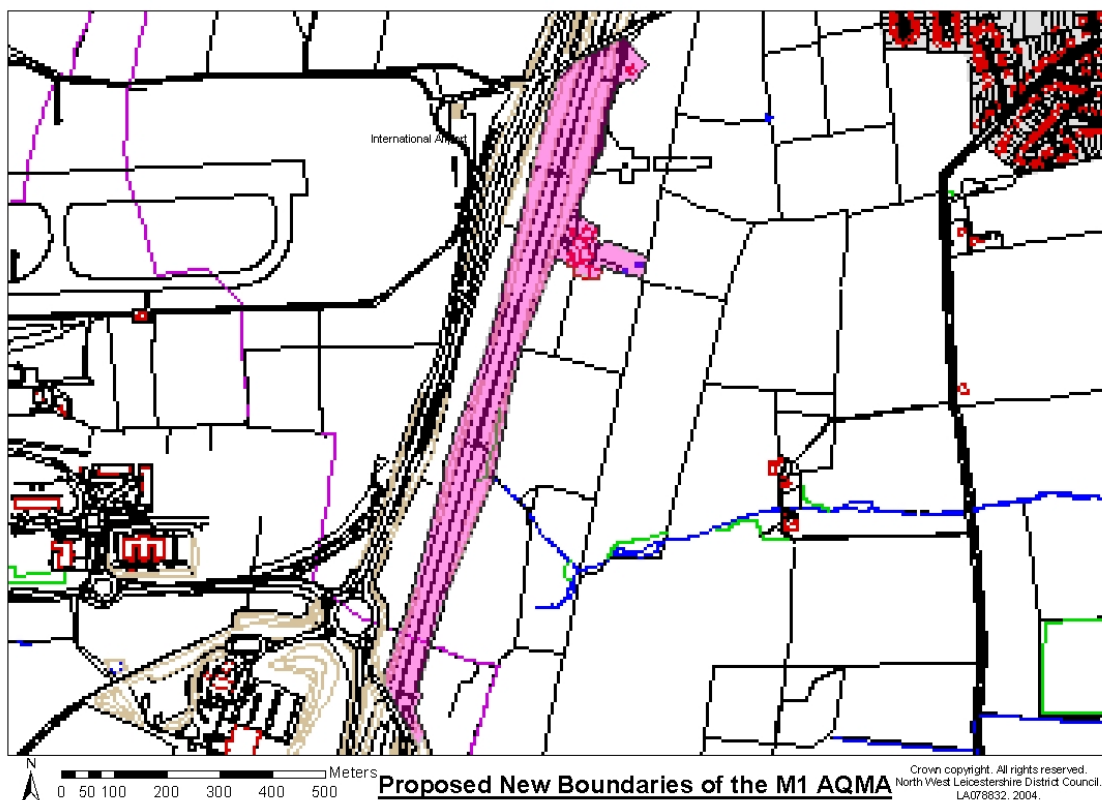


Figure 4.1 Boundaries of the M1 AQMA

The diffusion tube data based on 2002 indicated that tube 18, positioned in the vicinity of Mole Hill Farm, (which is the closest property to the M1) is expected to exceed the 2005 objective. Table 4.1

below shows a comparison of the annual mean 2005 levels predicted in the AQMA based on both monitoring and modelled data.

Table 4.1 Comparison of predicted monitored and modelled annual mean NO₂ for 2005 based on 2002 data AQMA M1

Receptor Location Name and Number	Predicted NO ₂ Annual Mean for 2005 (µgm ⁻³)	
	Monitored	Modelled
18 – Molehill Farm Kegworth	40.3	58.9

Since completion of the Stage 4 Report the annual average for NO₂ tube 18, for 2003 is available. Table 4.2 below shows the bias adjusted level for 2003 and the predicted level for 2005, using the Technical Guidance LAQM. TG(03).

Table 4.2 Predicted annual average for 2005 based on 2003 monitored data

Receptor Location Name and Number	NO ₂ Annual Mean (µgm ⁻³)	
	Monitored 2003	Predicted 2005
18 Molehill Farm Kegworth	54.6	51.8

Using the 2003 monitored data as the most recent data set it can be concluded that in the case of diffusion tube number 18 concentrations of 51.8µg/m³ are predicted for 2005 hence an improvement of 11.8µg/m³ is required if the objective is to be met. This is a greater than originally reported in the Stage 4 Report.

5. AQMA 2: KEGWORTH

5.1 Conclusions of the Stage 4 Report

Both monitoring and modelling work conducted within the Kegworth AQMA as part of North West Leicestershire District Council's Stage 4 Report, concluded that nitrogen dioxide levels are expected to be less than the $40\mu\text{g}\text{m}^{-3}$ objective in 2005 as detailed in Table 5.1.

Table 5.1 Comparison of predicted monitored and modelled annual mean NO_2 for 2005

Receptor Location name & number	Predicted NO_2 Annual Mean for 2005 $\mu\text{g}\text{m}^{-3}$	
	Monitored	Modelled
16 Kegworth A6	34.4	38.9

However, it was also noted that based on 10 months of monitoring data for 2003 the annual average was $41.3\mu\text{g}\text{m}^{-3}$. The Stage 4 concluded that:

'At this stage it is therefore, recommended that this AQMA is retained and continued to be monitored closely'.

The boundaries of the Kegworth AQMA are depicted in Figure 5.1. The AQMA contains approximately 60 residential properties with frontages within 10m of the A6. The A6 is a trunk road running through the village and is fronted by shops and houses.

Since completion of the Stage 4 Report the ratified annual average for the real time monitor for 2003 is available. Table 5.2 below shows the bias adjustment level for 2003 and the predicted level for 2005, using Technical Guidance, LAQM TG(03).

Table 5.2 Predicted annual average for 2005 based on 2003 monitored data

Receptor Location Name & Number	Predicted NO_2 Annual Mean for 2005 $\mu\text{g}\text{m}^{-3}$	
	Monitored 2003	Predicted 2005
16 Kegworth A6	43.0	40.8

Using the 2003 real time monitored data as the most recent data set it can be concluded that concentrations of $40.8\mu\text{g}\text{m}^{-3}$ are predicted for 2005; hence only a small improvement of $0.8\mu\text{g}\text{m}^{-3}$ is required, if the objective is to be met.

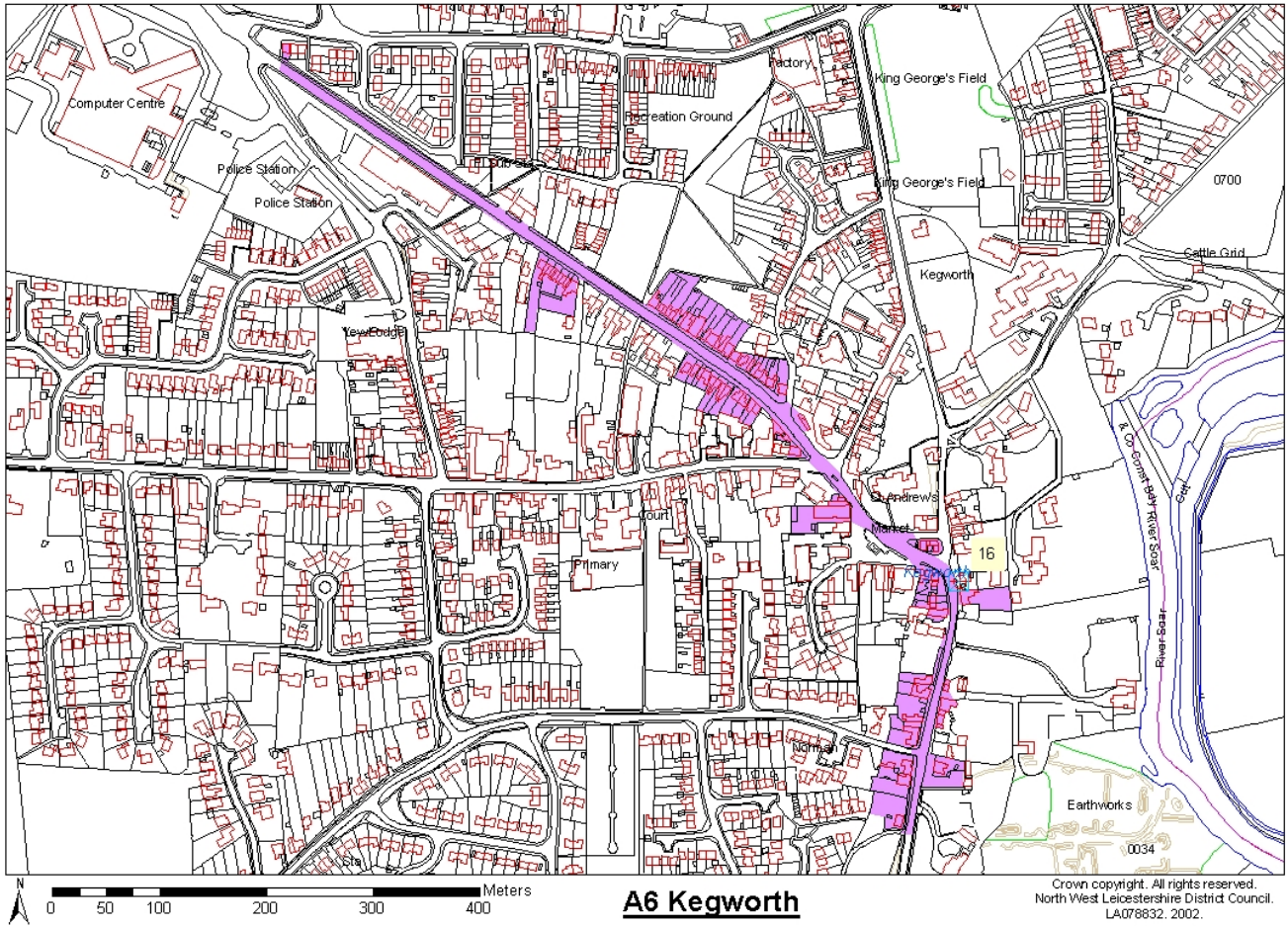


Figure 5.1 Boundaries of the Kegworth (A6) AQMA

6. Development of the Action Plan

In order for the Action Plan to be effective it must strike an appropriate balance between the effects of actions, and the likely benefits in terms of air quality.

6.1 Public Consultation

The process of public consultation is critical to the success of any Air Quality Action Plan.

In the case of the Air Quality Action Plan little flexibility existed in terms of significantly different courses of action. This is because the most significant source of NO₂ is from transportation sources.

As a consequence the consultation strategy agreed upon was aimed at groups of people at a local level where the specific detail of the broad policies could still be applied in different ways. A range of stakeholders have been identified and have been consulted on the draft report. The full list of proposed stakeholders consulted is contained in Appendix 2.

6.2 Proposed Actions

Table 6.1 lists the 26 actions under the following headings;

- Reducing vehicle emissions
- Improving the road network to reduce congestion
- Using area planning measures to reduce traffic volumes
- Reducing air pollution from industry, commerce and residential areas
- Changing levels of travel demand / promotion of alternative modes of transport
- Other measures.

Each action lists the body (or bodies) responsible for its implementation, how it will be implemented, an intended completion data where appropriate, and a simple cost/benefit analysis. This cost/benefit analysis considers total cost to all of the bodies responsible for implementation, and not simply the costs to North West Leicestershire District Council. For the purposes of this cost/benefit analysis 'Low' equates to less than £10,000, 'Med' equates to between £10,000 and £100,000 and 'High' equates to greater than £100,000. It is not possible to accurately quantify the expected improvement in air quality for each option. Instead a general estimate of high, medium or low improvement has been used to allow different actions to be compared.

It is important to recognise that uncertainty exists as to the level of reduction in total oxides of nitrogen necessary to reduce nitrogen dioxide to below the annual average limit value of $40\mu\text{gm}^{-3}$. However, the levels of traffic reduction in emissions of oxides of nitrogen needed to reduce nitrogen dioxide to an annual average of below $40\mu\text{gm}^{-3}$ is unlikely to be achieved by 2005 through the application of these actions. However, these actions are considered to strike an appropriate balance between the direct and indirect costs of taking action and the benefit in terms of improved air quality.

6.3 Implementation of the Action Plan

It is essential that the implementation of the Action Plan is closely monitored alongside the improvement in air quality. The Environmental Protection Section will take the lead role in monitoring the implementation of the Action Plan and will report annually on the progress of implementation.

Table 6.1 Proposed Actions

	ACTION	DETAILS	STAKEHOLDER	COMPLETION DATE	COST / BENEFIT
	REDUCING VEHICLE EMISSIONS				
1	Undertake roadside vehicle emission testing	North West Leicestershire District Council will re-evaluate the viability of the resumption of vehicle emission testing.	Environmental Protection Section	Ongoing	Low/Low
2	Improve the Council Fleet	North West Leicestershire District Council will continue to favour low emission vehicles in its own fleet.	North West Leicestershire District Council	Ongoing	Med/Low
3	Reduction in speed	Reduction in speed limit to optimum for NOx emissions from vehicles using the M1	Highways Agency	2005 – 2011	Med/Low
4	Discourage drivers from allowing their engines to idle unnecessarily when parked	The Council will carry out campaigns to raise awareness and to discourage drivers from allowing their engines to idle when their vehicles are parked for prolonged periods	Environmental Protection Section	2006	Med/Low
	IMPROVING THE ROAD NETWORK TO REDUCE CONGESTION				
5	Use of Hard Shoulder	Use of hard shoulder on M1 during periods of congestion – crawler lanes	Highways Agency	2005-2011	High/Low
6	Access Closure	Closure of side roads and rerouting of local traffic around Kegworth Junction 24 of the M1	Highways Agency	2005-2011	High/High
7	Improved signing	Improved signing on the M1 to reduce congestion	Highways Agency	2005-2011	High/Low
8	Use of physical barriers	Use of physical barriers to obstruct the air flow and reduce noise to neighbours	Highways Agency	2005 – 2011	High/Low
9	New Road Proposals	A bypass to be built for the A6 through Kegworth	Leicestershire County Council / Highways Agency	2011	High/High
10	Introduction of high occupancy lanes	Introduce high occupancy vehicles lanes along the M1 to reduce congestion	Highways Agency	2005 – 2010	High/Low

11	Widening of the M1	Widening of the M1 and/or A543	Highways Agency	2005 – 2010	High/Low
12	Improvements to Junction 24 of the M1	Improvements to Junction 24 of the M1 to reduce congestion in the area	Highways Agency	2005 – 2010	High/Low
	USING AREA PLANNING MEASURES TO REDUCE TRAFFIC VOLUMES				
13	Consideration of air quality in respect of Planning Applications	When assessing Planning Applications the implications of new development for air quality will be taken into consideration	Environmental Protection Section	Ongoing	Low/Med
	REDUCING AIR POLLUTION FROM INDUSTRY / COMMERCE AND RESIDENTIAL AREAS				
14	Control of Industrial Emissions	The Council will continue to strictly regulate approximately 84 industrial processes under Part 1 of the Environmental Protection Act 1990. In addition the Council will continue with its programme of searching for additional industrial premises which require a permit.	Environmental Protection Section	Ongoing	Low/Low
15	Emissions from chimneys	The Council will continue to enforce the provisions of the Clean Air Act 1993 with respect to emissions of smoke from chimneys across the District	Environmental Protection Section	Ongoing	Low/Low
16	Boiler Plant and Chimney Heights	The Council will enforce the provisions of the Clean Air Act 1993 in respect of chimney heights for new plant and smoke control	Environmental Protection Section	Ongoing	Low/Low
17	Control of Bonfires	The Council will enforce the provisions of the Clean Air Act 1993 and Part III of the Environmental Protection Act 1990 in respect to bonfires across the District.	Environmental Protection Section	Ongoing	Low/Low

	CHANGING LEVELS OF TRAVEL DEMAND / PROMOTION OF ALTERNATIVE MODES OF TRANSPORT				
18	Improving access to information regarding transport options	The Council will work with partners to encourage Travel Plans for employers and schools	North West Leicestershire District Council / Leicestershire County Council	OnAgoing	Low/Low
19	Improved public transport network	The Council will work closely with the County Council within LTP2	North West Leicestershire District Council / Leicestershire County Council	Ongoing	High/Low
20	School 'Walking Buses'	The Council will work with Leicestershire County Council to promote walking buses for local schools within LTP2	Leicestershire County Council / North West Leicestershire District Council	Ongoing	Low/Low
21	Safer routes to Schools	The Council will work with Leicestershire County Council to promote safer routes to Schools within LTP2	Leicestershire County Council / North West Leicestershire District Council	Ongoing	Med/Low
22	Introduce Car Parking Charges	Car Parking will be introduced to all Council owned car parks in the District	North West Leicestershire District Council	2005	Med/Low
23	Improved public transport network to Nottingham East Midlands Airport	The Council will work with its partners to improve the public transport network to the Airport	North West Leicestershire District Council / Nottingham East Midlands Airport / Leicestershire County Council	Ongoing	High/Low
	OTHER MEASURES				
24	Publicise Air Quality Information on the Website	Utilise the Council's Website to publicise Air Quality information	Environmental Protection Section	Ongoing	Low/Low
25	Promote home working	Promote home working with the Council for suitable employee's	North West Leicestershire District Council	Ongoing	Low/Low
26	Presentations to Schools	Undertake presentations to Schools highlight Air Quality issues	Environmental Protection Section	Ongoing	Low/Low

6.4 Reducing Vehicle Emissions

6.4.1 Roadside Emission Testing

Following the introduction of powers to allow local authorities with declared AQMAs to undertake roadside emission testing a number of authorities within Leicestershire have conducted both statutory and voluntary testing. Poor vehicle maintenance can increase levels of emissions by ten times or more. A minority of vehicles are very badly maintained and produce excessive pollution, the majority of which could be retuned within 10 minutes. Around 5% of vehicles have catalyts, which are not working properly. North West Leicestershire District Council is not considering undertaking statutory testing due to logistical and financial reasons. However, voluntary roadside emission testing would enhance public awareness of the issues and potentially decrease the numbers of excessively polluting vehicles on North West Leicestershire District Council's roads. Free voluntary testing at locations such as supermarket car parks will be undertaken to increase public awareness.

6.5 Improving the Road Network to Reduce Congestion

6.5.1 The Kegworth Bypass

The A6 is an important and busy route running through the village of Kegworth. Indeed the Leicestershire County Council's Leicestershire Local Transport Plan 2001 – 2006, recognises the A6 as an important and busy route in the area. It concluded that a solution to the problems caused by high traffic flows needs to be sought but that any proposals would be put on hold until completion of the Multi-Modal Study.

The Multi Modal Study has now concluded that development of the Kegworth bypass would have a positive affect on the air quality within this AQMA. The Multi Modal study concluded that over 60% of the traffic, travelling along the A6 at Kegworth does not have a journey end within the village but is traffic passing through Kegworth to/from M1 junction 24. Removal of through traffic from the A6 would significantly reduce the levels of NO₂ within the AQMA.

The A6 was detrunked on 27th September 2004 with all traffic management responsibilities for the road falling to Leicestershire County Council.

The implementation of the recommendations of the Multi Modal study is beyond the control of the Environmental Protection Section of North West Leicestershire District Council. However it is crucial that in developing this Action Plan to improve air quality, a partnership is established with the Highway Agency and The Leicestershire County Council.

A bypass for Kegworth would reduce the amount of traffic passing through the Kegworth and this in turn would reduce the levels of NO₂ being emitted from vehicles. The Kegworth bypass proposal is incorporated in the M1 widening scheme and the Highways Agency has appointed ARUP (consulting engineers) to take the scheme forward. The scheme is to be carried out in two phases, as the Kegworth bypass will involve works requiring the acquisition of additional land. ARUP are currently assessing options for the scheme and initial proposals for Phase 1 will be published in 2005. Phase 2 is not expected to be implemented until 2009/10. As regards the bypass the favoured route for the bypass is currently from the Southern part of the village to junction 23a. North West Leicestershire District Council will liaise closely with Leicestershire County Council and the Highways Agency and ARUP to ensure that any bypass will improve the current situation with regards to air quality and will not just move the problem elsewhere. A bypass is a long-term solution and other intermediate measures need to be considered to reduce the current levels of NO₂ to below the government objective.

In addition to the existing problems associated with this part of the A6, there is a large amount of employment related development committed to the area in and around the airport and Junction 24 of the M1. This will evidently have an impact on the types and amounts of vehicles passing through Kegworth and needs to be considered when developing the detail of this Action Plan.

6.6 Promotion of Alternative Modes of Transport

6.6.1 Safer routes to Schools

Safer routes to school projects are being run across the country in all grades of schools. The aim of the projects is to work together as a community to make the school journey safer and healthier for everyone. Initiatives may include school travel planning, creating safer routes for cycling, training for cycling and public transport improvements as well as highway measures such as traffic calming.

6.7 Other Measures

6.7.1 Promotion of Home Working

If large numbers of people worked from home traffic congestion could be reduced particularly during peak periods which would have a positive impact on air quality.

6.7.2 Information and Education

In order to successfully implement measures contained within this Action Plan requires the involvement and support of the public and stakeholder groups. In this respect the Council will undertake to provide

air quality information within all public libraries within the district along with all air quality reports and monitoring data being available on the council website.

Environmental issues are already taught within the school curriculum. Environmental Protection Officers will give presentations on air quality issues to local schools.

7. Other Factors Influencing Air Quality in North West Leicestershire

7.1 Nottingham East Midlands Airport

Nottingham East Midlands Airport has expanded considerably over recent years, including an extension of the runway and growth of the Pegasus Business Park. In March 2001, the Manchester Airport Group completed the purchase of Nottingham East Midlands Airport and since then the Airport has continued to perform well, with the success of the low cost carriers, passenger figures in 2001 were 2.38million. Cargo operators too have continued to grow with the Airport being widely recognised as the UK's largest pure cargo airport. As well as DHL, TNT and UPS both have bases in the vicinity of the Airport and is one of the Royal Mail's primary hubs, hence, the airport is also a major employer in the area.

The location of the airport means that although there are a number of bus companies, which serve the airport, the vast majority of the passengers, and staff still rely on the private car to access the site. This, in addition to freight leaving the airport on the road network has an impact on the M1 AQMA.

7.2 Donington Park

The Donington Park motor racing circuit is an internationally recognised venue, which holds a variety of top class motor races and pop concerts. The circuit is located approximately 4km from Junction 23A of the M1 and is connected to the M1 and the A42 via the A453. On occasions at weekends the traffic volumes in this vicinity are particularly high due to combined visitors attracted to the circuit and Nottingham East Midlands Airport and congestion. Congestion can be severe on the whole road network.

Appendix 1 – National Air Quality Objectives for Local Air Quality Management

Pollutant	Concentration Limits		Averaging Period	Compliance
	μgm^{-3}	ppb		
Benzene	16.25	5	Running Annual Mean	December 31 st 2003
1,3-Butadiene	2.25	1	Running Annual Mean	December 31 st 2003
Carbon Monoxide (CO)	11.6	10	Running 8hr Mean	December 31 st 2003
Lead	0.5	-	Annual Mean	December 31 st 2004
	0.25	-	Annual Mean	December 31 st 2008
Nitrogen Dioxide (NO ₂)	200	105	1hr mean not to be exceeded more than 18 times a year	December 31 st 2005
	40	21	Annual Mean	December 31 st 2005
Particulate Matter (PM ₁₀)	50	-	24hr mean not to be exceeded more than 18 times a year	December 31 st 2004
	40	-	Annual Mean	December 31 st 2004
Sulphur Dioxide (SO ₂)	266	100	15 minute average mean not to be exceeded more than 35 times a year	December 31 st 2004
	350	132	1hr mean not to be exceeded more than 24 times a year	December 31 st 2004
	125	47	24hr mean not to be exceeded more than 3 times year	December 31 st 2005

Appendix 2 - The Consultation Process

The following organisations / interested parties have been notified as part of the consultation process:

- Environment Agency
- Highways Agency
- Leicestershire County Council
- Leicestershire Primary Care Trust
- Leicester City Council
- Hinckley and Bosworth District Council
- Market Harborough District Council
- Blaby District Council
- Charnwood District Council
- Melton Mowbray District Council
- Oadby and Wigston District Council
- Kegworth Parish Council
- Kegworth Bypass Campaign Group
- Members of the Public