

Rotherham MBC



Air Quality Action Plan M1 Corridor 2006-2011

Produced by Neighbourhood Services

Rotherham MBC

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EXECUTIVE SUMMARY

Following designation of M1 Air Quality Management Areas on 1st January 2002 and the amendment on 7th July 2003, Rotherham MBC produced their first Air Quality Action Plan presenting the measured being adopted by the Council in pursuit of the Air Quality Objectives in the M1 Corridor. In July 2003, an Air Quality Action Plan was published by Rotherham MBC detailing the development of the local air quality action plan and the measures selected as the best practicable ways of moving towards the statutory air quality targets.

This Air Quality Action Plan 2006-2011 contains revised measures to be implemented 2006-2011 and takes into account developments with respect to the M1 in the Rotherham area. These include:

- Proposed widening of the M1 motorway
- South Yorkshire Local Transport Plan 2006-2011
- Consultation workshops with Bawtry Road residents
- Feasibility study of the proposed Grange Lane Scheme

Selection and Prioritisation of Options

The Air Quality Action Plan (2003) presented a number of options for further study or implementation. In this report, these options are assessed using the latest government guidance and results from feasibility studies produced since July 2003. The main criterion for assessment of an option within the plan was the cost effectiveness of the measure with respect to improving air quality. However, other considerations were also factored in such as consistency with other local policies, likely timescales and non-air quality impacts. All options which have been completed or rejected have not been included from the Air Quality Action Plan 2006-2011

Measures 2006-2011

A number of packages of measures are included in the Air Quality Action Plan 2006-2011. These are:

Improving public transport:

- **Quality Bus Corridor Programme**
- **Extension of Supertram into Rotherham**

Campaigns:

- **South Yorkshire 'Care4air' Campaign**

Planning:

- **Travel Planning**
- **Planning Guidance**
- **Air Quality Assessment of major schemes**

M1 Specific Measures:

- **Mitigation measures**

European/National measures

- **New Euro Standards for vehicles**

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- **Programme of incentives to increase the penetration of low emission vehicles**
 - **Potential National road pricing scheme**

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CHAPTER 1 INTRODUCTION

This report presents work carried out in partnership with the other South Yorkshire authorities, the South Yorkshire Passenger Transport Executive, other local bodies and agencies. and the actions adopted by Rotherham Metropolitan Borough Council (RMBC), in pursuit of the Air Quality Objectives in the M1 Corridor. It has been prepared following extensive consultation with neighbouring councils, local bodies, national agencies and the public.

Rotherham MBC Corporate Plan

The Council has designated five priority themes as part of its strategic framework. Of these, the following priority is an integral part of the ethos behind the work to improve the air quality of Rotherham:

'Rotherham Safe'

"Rotherham will be a place where neighbourhoods are safe, clean, green and well maintained, with well-designed, good quality homes and accessible local facilities and services for all. There will be attractive buildings and public spaces. Communities will be peaceful but thriving, relatively free from crime and the fear of crime, drugs and anti-social behaviour. Environments, people and businesses will be protected and nurtured. Children will be safe from harm and neglect. A preventative approach will be taken to minimise crime, accidents and hazards; and to further strengthen resilience and thus safeguard all Rotherham citizens."

The Air Quality Action Plan details action to be taken by the Council and partner organisations in pursuit of improved air quality. This is in line with the Council's commitment to Sustainable Development and the objective of protecting the environment, which includes a commitment to reduce levels of air pollution in the borough (Corporate Plan 2005-2011).

Air Quality Action Plans

An local authority air quality action plan is required when certain air pollutants are present at concentrations that exceed the National Air Quality Objectives resulting in the declaration of Air Quality Management Areas, (AQMA's). The Rotherham M1 Corridor AQMA's have been declared on the basis that levels of nitrogen dioxide (NO₂) exceed the Air Quality Objectives at residential properties and other sensitive locations.

Since 2003, a significant amount of work has been carried out on behalf of Department for Food Environment and Rural Affairs regarding the technical and non technical options for reducing emissions of air pollutants from road transport and a new Air Quality Strategy (draft published April 2006) has been developed. Current thinking on future air quality policy is that where health improvement is the driving force behind air quality improvement:

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- (i) maximum health benefits are achieved across urban areas through targeted reductions in PM₁₀, even when levels are below the objective levels; and
 - (ii) greater health and environmental benefits are derived through considering different policy approaches that aim to reduce overall NO_x and secondary pollutant levels rather than focusing on NO₂ hotspots.

A requirement of this action plan is to show how Rotherham MBC is using its powers to work towards the achievement of the air quality objectives for NO₂ in the M1 Corridor AQMA. Rotherham MBC has considered the implications of the advice on future air policy. The actions presented in this report have been assessed to determine their impact on the wider environment and where actions are likely to change overall emissions of PM₁₀ and NO_x this effect has been considered.

Future national and local policies may drive reductions in emissions of PM₁₀ and NO_x and this plan will be revised periodically to reflect changes in Air Quality Objectives, national policy and guidance. The Air Quality Action Plan 2006-2011 covers the same time period as the South Yorkshire Local Transport Plan 2.

Chapter 2 Background

The UK's Air Quality Strategy and EU Directives

The mandatory air quality criteria that apply to the UK are the European Community Directive limit values and the objectives from the Air Quality Strategy for the UK, which are incorporated into regulations.

The Air Quality Objectives, as set out in the Air Quality Regulations (England) 2000 and amended by the Air Quality (England) (Amendment) Regulations 2002, are presented in Table.2.1. These objectives provide the statutory basis for the system of local air quality management (LAQM). If a local authority determines that these air quality objectives will not be met at any relevant locations, (locations outside the workplace¹ where people are likely to be exposed for a significant amount of time) then the authority must designate these locations as AQMAs. Units in the tables are given primarily as $\mu\text{g}/\text{m}^3$ (micrograms, or millionths of a gram per cubic metre of air)².

Under the 1996 European Union Ambient Air Quality Assessment and Management Directive, new “Daughter Directives” have been and are being prepared. The first of these sets legally binding limit values for concentrations of sulphur dioxide, nitrogen dioxide, particles and lead in air which must be complied with by 1 January 2005 or, in the case of nitrogen dioxide, 2010. A second “Daughter Directive” sets limit values for concentrations of benzene and carbon monoxide to be complied with by 2010 and 2005 respectively. The “Daughter Directive” limit values will supersede previous EC Directives on their achievement date (i.e. 1 January 2005 or 1 January 2010). A third “Daughter Directive” for ozone has been agreed by the EU Member States and a fourth “Daughter Directive” for polycyclic aromatic hydrocarbons and heavy metals has recently been adopted.

¹ Exposure to air pollution in the workplace is covered under separate legislation.

² There are two exceptions: carbon monoxide for which concentrations are given in $\text{mg}\cdot\text{m}^{-3}$ (milligrams, or thousandths of a gram, per cubic metre of air) and PAHs – polycyclic aromatic hydrocarbons – for which concentrations are described in $\text{ng}\cdot\text{m}^{-3}$ (nanograms, or billionths of a gram, per cubic metre of air).

Table.2.1 – Objectives included in the Air Quality Regulations (England) 2000 and in Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management

Pollutant	Air Quality Objective		Date to be achieved (UK)	Date to be achieved by (EU)
	Concentration	Measured as		
Benzene ¹	16.25 µg/m ³	running annual mean	31.12.2003	01.01.2010
	5 µg/m ³	annual mean	31.12.2010	01.01.2010
1,3 Butadiene	2.25 µg/m ³	running annual mean	31.12.2003	N/A
Carbon monoxide ¹	10.0 mg/m ³	maximum daily running 8-hour mean	31.12.2003	01.01.2005
Lead	0.5 µg/m ³	annual mean	31.12.2004	01.01.2005
	0.25 µg/m ³	annual mean	31.12.2008	01.01.2005
Nitrogen Dioxide ²	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005	01.01.2010
	40 µg/m ³	annual mean	31.12.2005	01.01.2010
Particles (PM ₁₀) (gravimetric) ³	50 µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	01.01.2005
	40 µg/m ³	annual mean	31.12.2004	01.01.2005
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year	1-hour mean	31.12.2004	01.01.2005
	125 µg/m ³ not to be exceeded more than 3 times a year	24-hour mean	31.12.2004	01.01.2005
	266 µg/m ³ not to be exceeded more than 35 times a year	15-minute mean	31.12.2005	N/A

¹ The Air Quality Objective of 5 µg/m³ for benzene and the objective of 10 µg/m³ for carbon monoxide came into force in separate Air Quality (Amendment) Regulations for England and Wales on 11 December 2002 and 31 December 2002 respectively.

² The objectives for nitrogen dioxide are provisional.

³ Measured using the European gravimetric transfer sampler or equivalent.

In some cases, the UK's air quality strategy seeks early implementation of the EU's limit values, reflecting the belief that standards can and should be achieved more quickly in the interests of protecting public health. It should be noted that the UK's standard of 40µg/m³ to be met, as an annual mean concentration by

31st December 2005 is only a provisional target. The same figure is adopted in the EU Directive, though the compliance date is currently set at 1st January 2010.

Reference is made in the tables to a number of permitted exceedences of several of the standards in any year. This reflects the fact that periodic events (climate, bonfire night, etc.) make it unlikely that the standards given could be met at all times. By permitting a maximum number of exceedences, a higher level of protection is hoped to be provided for public health.

The new national particulate matter (PM₁₀) objective for 2010 announced on the 5th of August 2002 are provisional and are not, for the time being, included in Regulations for the purposes of Local Air Quality Management.

The objectives as they apply to England (excluding London) are as follows: -

Table 2.2 - Provisional PM₁₀ Objectives

Pollutant	Concentration	Measured As	Achievement Date
Particles (PM ₁₀) (gravimetric)	50µg/m ³ not to be exceeded more than 7 times a year	24 Hour Mean	31 st December 2010
Particles (PM ₁₀) (gravimetric)	20µg/m ³	Annual Mean	31 st December 2010

Policies that Affect Air Quality

This section provides an overview of the existing policies, which directly or indirectly address air quality issues. There are three levels of policy that are relevant: local, regional and national.

Local Policy

The most significant documents dealing with air quality improvement at a local level are the existing Unitary Development Plan (UDP), adopted in June 1999 and the Local Transport Plan (LTP), and its replacement, the second South Yorkshire Local Transport Plan (LTP2), published in March 2006.

Under recent planning reforms, the UDP will be replaced by a new Local Development Framework (LDF) to guide future development in Rotherham up to 2021. The first stage of this reform involved the Local Development Scheme being agreed with the Secretary of State by 31st March 2005. This introduces the timetable for producing subsequent local development documents. The main document will be the Core Strategy setting out a vision, spatial development framework to 2021 together with broad strategic policies which are likely to require developers to submit Air Quality Assessments and to set out where development is considered to be unacceptable on air quality grounds. These

matters will be taken further in supporting the detailed Policies and Site Allocations Documents and there is likely to be scope for a future Supplementary Planning Document.

In the Rotherham M1 AQMA, one of the major sources of air pollution is road traffic and many measures that improve air quality are transport related. LTP2 has been developed to try to address some of South Yorkshire's transport problems, by working towards the national/local government shared priorities of improving accessibility, tackling congestion, better road safety, better air quality and quality of life. It is planned that the Air Quality Action Plans for South Yorkshire's 'local road' AQMAs will be integrated into SYLTP2. The LTP2 document acknowledges its role in addressing air pollution from traffic; however, it emphasises that significant reductions in the volumes of traffic across the road network cannot be achieved through the LTP measures alone. The LTP predicts that specific and targeted campaigns to improve air quality can work when combined with action through the emerging South Yorkshire Spatial Strategy, targeting investment and development in the most sustainable locations.

A number of local plans have been considered in the production of this action plan and these are listed in the reference section. The main objectives and actions for each one were considered, together with information on costs and effectiveness. Although a large number of objectives and actions have been proposed in these local plans, few details were available on their costs, effectiveness, monitoring and evaluation.

Regional Policy

At a regional level, the main planning document, which has an air quality element, is the Regional Spatial Strategy (RSS) for Yorkshire and the Humber. A draft RSS (The 'Yorkshire and Humber Plan') was submitted to Government on 23rd December 2005. This document will form the new Regional Spatial Strategy for this Region. It will provide a spatial framework to inform the preparation of local development documents, local transport plans and regional and sub-regional strategies and programmes that have a bearing on land use activities. Following an Examination in Public in September/October 2006 and the Report of the Panel published in May 2007, Proposed Changes to RSS are expected in ; September 2007. Final RSS is programmed to be issued by the Secretary of State in March 2008.

National policy

The national policy framework has an effect on air quality in addition to the Air Quality Strategy and associated European legislation. Key transport initiatives, as described in the Local Air Quality Management Policy Guidance, LAQM.PG(03) and the Air Quality Strategy 2006, include:

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- Regulatory measures and standards to reduce vehicle emissions and improve fuels
 - Tax-based measures that encourage people to supply and use cleaner fuels and also encourage them to buy more environmentally-friendly vehicles; and
 - The development of an integrated transport strategy that supports sustainable development.
 - National road pricing scheme
 - Incentives to phase out the most polluting vehicles
 - Small combustion plant measures
 - Supporting delivery of a low emission zone in London and other urban areas
 - Measures to reduce emissions from shipping

The Highways Agency

The Highways Agency (HA), is an executive agency of the Department for Transport. The HA maintains operates and improves the network of trunk roads and motorways in England, including the M1. The HA can influence air quality through:

- Contributing to strategic planning;
- Road improvements;
- Integrating transport and encouraging sustainable travel;
- Providing better information for improved operation; and
- Working with local authorities to deliver the National Air Quality Strategy

The decision to include M1 Jct 30 to Jct 37 widening in the Government's programme of major road schemes follows detailed assessment by the Highways Agency.

This was requested by the Government in July 2003 in response to proposals contained in the South and West Yorkshire Multi-Modal Study (SWYMMS). The Government invited the Highways Agency to develop proposals to make better

use of the existing trunk roads by considering the use of narrow lanes, the use of existing hard shoulders, and the use of active traffic management to reduce congestion of the strategic highway network in the region.

The M1 is one of Britain's most important and busiest roads. As many as 140,000 vehicles used the M1 motorway each day in 2005. That number is likely to grow by 2.6% a year (HA figures).

The M1 J30-J42 and M62 J25-28 work is part of a wider package designed to reduce congestion and improve safety and journey time reliability on both the M1 and M62.

To ensure increased capacity due to motorway improvement is not lost due to the generation of additional traffic we are using various Integrated Demand Management methods (IDM) e.g. dedicated lane for vehicles with more than one occupant (High Occupancy Vehicle lanes); and traffic signals at junctions (Access Control) and on slip roads to regulate flow of traffic onto the motorway (Ramp Metering).

There are nine projects in the M1/M62 widening/improvement package, which will result in the widening of 38.3 miles of the M1 between Junctions 30 (Chesterfield) and 42 (Leeds), and 10.3 miles of the M62 between junctions 25 (Huddersfield) and 28 (Leeds):

These schemes are the response to Department for Transport recommendations in the [South and West Yorkshire Multi Modal study \(SWYMMS\)](#) for increased capacity on the M1 and M62.

In 2006, the proposals were in the early stages for all schemes except M1 J31-32. M1 J31-32 which passes through Rotherham between Aston and Upper Whiston is due to be constructed from October 2006. This project is being built sooner than the others because more land is not needed to build it. This scheme was planned before the M1/M62 Improvement package entered the TPI. Thus an Environmental Statement has already been produced. This has been revisited, although there were no significant changes.

These schemes are currently being assessed by the HA to determine the likely impact on local air quality in the vicinity of the motorway. This has particular relevance in the M1 AQMA where EU limit values are unlikely to be met before 2010. The widening of the M1 between J31-J32 has the potential to lead to the extension of Rotherham M1 AQMA (1).

The regulation of development related to available capacity and air quality conditions on the Strategic Road Network is being managed in partnership between the South Yorkshire Local Authorities and the Highways Agency under the Memorandum of Agreement. DfT Circular 02/2007 "Planning and the Strategic Road Network" also requires the Highways Agency and Local Planning

Authorities to collaborate in assessing the appropriateness of new sites allocated in LDFs against SRN and air quality management objectives.

Summary

It would be inappropriate to develop air quality policy in Rotherham independently of the policies and plans listed above. To do so would ignore the fact that joined-up policy making offers substantial benefits in terms of cost-effectiveness. For this reason, the impacts of options for air quality improvement on transport, noise and climate change (amongst other wider environmental issues) were considered in the assessment of options summarised in chapter 3 of this report.

CHAPTER 3 M1 AIR QUALITY ACTION PLAN 2006-2011

Overall Objectives

The principal objective of the action plan is to improve air quality in the Rotherham area and reduce the number of residents subject to exposure to any pollutant at a level exceeding the Air Quality Objectives.

The objectives considered during the development of the action plan were written in very broad terms. These reflect the economic, social and environmental dimensions of sustainability.

Box 1. Objectives considered during the development of the Rotherham Air Quality Action Plan

Meet the air quality standards laid down in the National Air Quality Strategy, whilst:

- improving the quality of life of the residents and people who work in Rotherham
- acting in a cost-effective manner, through careful selection of options and by integrating our work with the activities of other Council Departments and other agencies,
- taking account of the views of local people,
- and acting, where possible, to stimulate the local economy.

Abatement of NO_x emissions

It must be emphasised that action is needed to reduce emissions of NO_x in order to move towards the annual average air quality objectives for NO₂ in the AQMAs.

Recommended Options for Air Quality Improvement in the M1 Corridor

This chapter identifies the options recommended for improving air quality across Rotherham. Some measures are specific to the M1, though a number provide air quality benefits over a wider area.

Implementation Programme

Neighbourhood Services will continue to fulfil the Council's statutory duties relating to the continuing review and assessment of air quality of Rotherham. These duties include the production of a yearly progress report (for submission to DEFRA) reporting progress towards the M1 Air Quality Action Plan's overall

objective of meeting the air quality targets. However, the success of the Plan will depend on the active involvement of a number of local and national organisations, the policies of central government, and the actions of general public.

One key challenge will be the achievement of the air quality objectives taking into account the on-going regeneration of Rotherham and the rest of the region. Rotherham Investment and Development Office (RIDO) is well placed to lead on working with developers to incorporate mitigation measures to minimise a development's impact on air quality.

The adoption of Rotherham MBC Air Quality and Planning Policy Guidance document is required, this will be jointly produced by Neighbourhoods and Adults Services and Environment and Development Services.

The following table summarises the selected measures for the period 2006-2011.

Table 3.1 – Rotherham M1 Air Quality Action Plan 2006-2011

Measure	Description	Lead/Key Organisation	Air Quality Impact in M1 AQMA	Timescale	Cost	Non-air quality impact	Comments
Package 1 – Public Transport							
Quality Bus Corridors (1a)	LTP 2006-2011	South Yorkshire Local Transport Plan partners. Rotherham MBC Sheffield CC Doncaster MBC	<1 ug/m ³	2006-2011	>£100,000	Modal shift CO2 benefit Congestion Accessibility Social Inclusion	
South Yorkshire wide Car Club (1b)	Carplus, the Leeds-based charity set up to promote car clubs around the region aims to have a single club across South Yorkshire .	South Yorkshire partners.	<1 ug/m ³	2006-2009	>£100,000	Social Inclusion Modal shift CO2 benefit Congestion Accessibility	Carplus is working with Sheffield City Council to launch the Car Club in the city during 2006-07.
Extension to Supertram (1c)	Long term project	South Yorkshire LTP partners and Department for Transport	1-2 ug/m ³	2006-2011	>£100,000	Modal shift CO2 benefit Congestion Accessibility Social Inclusion	Department for Transport has suggested a guided bus as a substitute for the Supertram extension.

Measure	Description	Lead/Key Organisation	Air Quality Impact in M1 AQMA	Timescale	Cost	Non-air quality impact	Comments
Package 2 Campaigns							
Care4Air Campaign (2a)	South Yorkshire media campaign - Care4Air	Partnership of four South Yorkshire Councils and South Yorkshire Passenger Transport Executive	<1 ug/m ³	2006-2011	<£100,000 /annum	Modal shift CO2 benefit Congestion Energy conservation Health	Raising awareness and informing the public about how their choices can affect their local air quality.

Measure	Description	Lead/Key Organisation	Air Quality Impact in M1 AQMA	Timescale	Cost	Non-air quality impact	Comments
Package 3 Planning							
Travel Plans (3a)	Increase the number of Rotherham's workplaces with a Travel Plan in place.	Rotherham MBC Environment and Development Services SYLTP2 Central Team SYPT HA	1-2 ug/m ³	2006-2011	<£100,000	Modal shift CO2 benefit Congestion Health	Rotherham has been fortunate enough to be included in the Area Travel Plan Work that the HA is carrying out - one of the three in Yorkshire & Humber is Templeborough including Centurion Business Park. Close to the M1 AQMA.
Planning and Air Quality Guidance (3b)	Guidance to be adopted by Rotherham MBC	Rotherham MBC Neighbourhood and Adult Services and Environmental and Development Services	<1 ug/m ³	2007	<£100,000	Modal shift CO2 benefit Congestion Health	

Assess proposed major schemes for air quality impact (3c)	<p>Assess proposed major schemes for air quality impact and encourage the use of mitigation measures.</p> <p>This includes air quality monitoring projects undertaken by both Rotherham MBC and developers.</p>	<p>Rotherham MBC Neighbourhood and Adult Services and Environmental and Development Services</p>	<1 ug/m ³	2006-2011	<£100,000	<p>Modal shift CO2 benefit Congestion</p>
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Measure	Description	Lead/Key Organisation	Air Quality Impact in M1 AQMA	Timescale	Cost	Non-air quality impact	Comments
Package 4 – Options Specific to Reducing Emissions from the M1 and Traffic Using the Motorway							
Mitigation measures (4a)	Mitigation measures such as reduced speed limits	Highways Agency	1-2 ug/m ³	2011 onwards	>£100,000	Congestion Strategic network journey times	Could be implemented as part of M1 J30-J37 widening (2011)
Package 5 – European/National measures							
New Euro Standards V/VI (5a)	A potential EU wide measure consisting of new vehicle emission standards for diesel passenger cars, Luvs and HGVs.	EU	1-2 ug/m ³		Not quantified	Ecosystem benefits Positive social/health impacts.	
Programme of incentives to increase the penetration of low emission vehicles (5b)	Packages to reduce the cost of motoring for those who buy the cleanest/most efficient vehicles.	Central Government	<1 ug/m ³		Not quantified	Potential positive social/health impacts.	
National road pricing scheme (5c)	National road pricing.	Central Government	1-2 ug/m ³		Not quantified	Congestion, Strategic network journey times	

CHAPTER 4 DEVELOPMENT OF THE ROTHERHAM M1 ACTION PLAN

The development of the action plan was detailed in the Air Quality Action Plan – M1 Corridor Rotherham, published July 2003. A brief summary of the process is included below.

M1 Corridor Clean Air Partnership

The lead role in convening the M1 Corridor Clean Air Partnership (M1CCAP) stakeholder forum has been taken by council officers from Rotherham and Sheffield councils, working in partnership. The M1CCAP has had a major role to play in developing the M1 Action Plan. Expertise from the consultants, BDOR was employed in the early stages of the production of the Action Plan.

The following represent the key elements of the approach used:

1. Extensive stakeholder consultation in the early development of the plan provided insight on the types of options that people favoured, and the reasons for preferences expressed. These views were considered in the multicriteria assessment.
2. Review of the options that could be adopted to improve air quality in the M1 corridor in Rotherham, and the impacts that are linked to them. This was carried out using data from several sources:
 - Local information presented in various plans (e.g. the Local Transport Plan).
 - Information gathered from stakeholders during the consultation process.
 - AEA Technology's AirAction database of options for improving air quality, which includes information from various sources on costs and impacts of many of the options listed, drawn from international literature.

Stakeholder involvement was continued through the review of the plan, and, subsequently in the assessment of the way that the plan was implemented.

The STAKEHOLDER consultation process

The stakeholder consultation process was developed around the M1 Corridor Clean Air Partnership (M1CCAP). Several meetings of the group were convened during the development of the plan.

The early stages of consultation were conducted at a relatively general level and dealt with the attitudes of people living and working within the M1 corridor towards different options for improving air quality.

In the final stage of consultation more specific questions were raised to determine how much support each measure would receive and whether they agreed with the assessment and ranking of different measures.

In addition, commitment for stakeholders to act to improve air quality was sought through the consultation process.

Identifying Options for Improving Air Quality

Potential options were identified through AEA Technology's AirAction system. This has drawn on numerous sources such as research reports for UK government and the European Commission. Additional options were identified through consultation with local. The importance of consultation in this process is demonstrated by the fact that local options can be far more cost-effective than those that would otherwise be considered.

Option Prioritisation

Options were identified through the consultation process were prioritised to account for the different attributes of each individual option relative to:

- 1) Cost
- 2) Effectiveness in improving air quality
- 3) Timescale and potential to implement the option before 2005 and 2010
- 4) Non-air quality impact

A more detailed breakdown of the environmental, health, economic and other effects of the options was considered in the development of the plan. A summary of the actions and whether they have now been completed or rejected is presented in Table 4.1 below.

Table 4.1 – Summary of actions - Rotherham MBC Air Quality Action Plan 2003-2005

Measure	Description	Lead/Key Organisation	Air Quality Impact	Progress 2003-2005	Cost	Non-air quality impact	Rejected?
Package 1 – Improving Public Transport							
1a	Advancing the QBC programme, to develop more routes and bring schemes into action	Bus operators, SYPTE, Councils	Low	QBC programme advanced across South Yorkshire	£10 ⁶ .	Significant impact as part of an overall package of pro-bus measures.	No
1b	Major expansion of park and ride provision	Public transport operators, SYPTE, Councils	Low	Sites prioritised	£100,000 10 ⁶	Significant as part of an overall package of pro-bus measures.	No
1c	Strict enforcement of priority schemes such as bus lanes	Councils	Low		low	Journey times Congestion Accessibility.	Yes
Package 2 – Transport Infrastructure and Traffic Control							
2c	Explore further potential for traffic control measures that would benefit air quality	Rotherham MBC	Assessed through further feasibility studies		Up to £1 million	Congestion Noise	No

Measure	Description	Lead/Key Organisation	Air Quality Impact	Progress 2003-2005	Cost	Non-air quality impact	Rejected?
Package 3 – Cleaner Vehicles							
3b	Set emission standards for vehicles routinely accessing sensitive areas (Low Emission Zone)	Councils	Low	Sheffield City Council - feasibility study on a potential LEZ for Sheffield City Centre	Unknown	Noise. Social Inclusion – adverse impact	Yes
3	Awareness raising of air quality problems as a result of emissions from vehicles including vehicle emission testing	South Yorkshire Vehicle Emissions Testing Scheme (SYVET)	Low	South Yorkshire Vehicle Emission Testing ran from 2003-2004.	£300,000	Noise Greenhouse gases	Yes. Funding ended by DfT.
3a	Set emission standards for Council vehicles and organisations contracted by the Councils	Councils and their contractors	Low		low		Yes

Measure	Description	Lead/Key Organisation	Air Quality Impact	Progress 2003-2005	Cost	Non-air quality impact	Rejected?
Package 4 – Options Specific to Reducing Emissions from the M1 and Traffic Using the Motorway							
4a	Reduce speed limit on the M1 to a more optimal level for NOx and Particulate emissions.	Highways Agency	Medium		£millions	Change in emissions of other air pollutants and noise. Congestion at peak times may require modest capacity increases. Information would need to be provided to tell drivers why a reduced speed limit was in force.	No
4b	Introduce variable message signing to smooth traffic flows on the M1 and on surrounding link roads	Highways Agency, Rotherham MBC, Sheffield City Council	Low	Completed on M1 re traffic information 2005	£millions	Reduction in emissions of other air pollutants and noise, reduced risk of accidents, lower congestion, etc. System has worked well on the M25.	Implemented 2005

Package 4 – Options Specific to Reducing Emissions from the M1 and Traffic Using the Motorway – continued

4c	Use signs and redesign entrances to Bawtry Road to shift through traffic to surrounding roads and away from Tinsley and Brinsworth.	Rotherham MBC	Medium	Consultation exercise carried out for Bawtry Road 2004. Full scheme feasibility study.	Full scheme £millions	Reduction in emissions of other air pollutants and noise, reduced risk of accidents, lower congestion, etc. Impact on local business located along Bawtry Road.	Yes
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4d	Councils to develop a joint action plan with HGV operators that require access to Tinsley and Brinsworth.	Sheffield and Rotherham Councils and relevant HGV operators	Low			May also improve noise, and foster closer relationships between businesses and residents	Yes
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Package 5 – Industry

5a	Encourage major industries to adopt accredited environmental management and auditing systems	Environment Agency	Low		Measures should save money when EMAS is implemented well.	General improvements in background air quality and reduction in environmental impact	Yes
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Measure	Description	Lead/Key Organisation	Air Quality Impact	Progress 2003-2005	Cost	Non-air quality impact	Ranking
Package 6 – Planning and Organisational Issues							
6a	Implement green procurement across the council	Councils and National government	Low		Significant potential for cost savings through more efficient use of resources	Widespread improvements in environmental performance	Yes
6c	Promote adoption of travel plans by all significant employers in the area	Councils, SYPTE, businesses	Medium		Should be cost neutral or better	General reduction in emissions, congestion, etc.	No
6e	Adopt Supplementary Planning Guidance on air quality and planning	Rotherham Council	Low		To developer	Council would be seen to factor air quality properly into planning decisions. Increased costs to developers in preparing application and mitigation measures	No
Package 7 – Actions for Consideration by National Government							
7	Support policies that are most effectively dealt with by National Government	Rotherham Council and National government	high	Long-term		Most actions will affect other policy areas and should be assessed to determine there wider impact	No

the revised action plan

Some of the actions detailed in the Air Quality Action Plan 2003 and summarised in the table above, are not included in the Air Quality Action Plan 2006-2011. The rationale for these changes is detailed below.

Measure	Description	Reason for revision
1c	Strict enforcement of priority schemes such as bus lanes	This measure has been assessed to have no impact on the M1 AQMA.
3a	Set emission standards for Council vehicles and organisations contracted by the Councils	All vehicles used by Rotherham MBC are leased for a period of 3 years from new. The most up to date vehicles in terms of Euro engines are therefore being used.
6a	Implement green procurement across the council	This is unlikely to have any impact on air quality in the M1 AQMA.
	Set emission standards for vehicles routinely accessing sensitive areas (e.g. taxis, buses using the town centre, etc.) (Low Emission Zone)	In South Yorkshire, this is subject to feasibility study for Sheffield City Council, to be completed at the end of 2006. An LEZ would not be practicable for the M1 AQMA as that Rotherham MBC has no control over the traffic on the M1 and there is no prospect of that ever being so. It is doubtful whether there are enough badly polluting vehicles starting and finishing their journey within the AQMA to make a serious difference to air quality when the main problem is the amount of motorway traffic. Up to 2011 the SYLTP does not include any indication of plans to incorporate LEZs in Motorway AQMAs.
4c	Use signs and redesign entrances to Bawtry Road to shift through traffic to surrounding roads and away from Tinsley and Brinsworth.	In 2004 Rotherham Metropolitan Borough Council, in partnership with Sheffield City Council examined the possible measures for improving air quality along Bawtry Road, through a stakeholder engagement process. Workshops were held for residents, councillors, council officers, community groups and businesses to discuss their concerns and identify actions to improve air quality. Atkins Environment prepared an initial feasibility study to identify which of the options should be taken forward for further assessment based on cost-effectiveness, air quality and non-air quality impacts. The report concluded that working with business to promote travel plans and improving pedestrian access to the Supertram could improve air quality in the Bawtry Road area. The most effective of the proposals in terms of air quality was apparently a scheme to adopt a private link road (Grange Lane) which was proposed as a result of the stakeholder dialogue. It would take traffic away from housing and divert through a non-residential area. Rotherham MBC Transportation and Planning

		<p>Services in partnership with Neighbourhood Services commissioned a proposal for a costed feasibility study for the various options of linking Bawtry Road to Sheffield Road via Grange Lane.</p> <p>The scheme was found to have negative cost benefit in terms of attracting DfT funding and therefore not viable for taking forward.</p>
4b	Introduce variable message signing to smooth traffic flows on the M1 and on surrounding link roads	This has been introduced (2005).
5a	Identify industrial sites which have the most significant impacts on the AQMAs	The industrial site (Outo Kumpu Steel) with the most significant industrial impact on the M1 AQMA has now closed.

Development of Implementation and Monitoring Mechanisms

In addition to developing a list of options, this plan includes description of mechanisms for implementation and monitoring to ensure that the process for successful application of the plan is understood.

Future Development of the Action Plan

This Action Plan should be regarded as one that is flexible and can be adjusted as new information or new techniques for pollution control become available. Prior to undertaking some of the options that will be listed in the plan, it will be necessary to commission specific feasibility studies, particularly where costs will be high. If any option is found impracticable, for example on cost grounds, or has impacts that were not foreseen or are far more significant than originally thought, the plan should clearly be updated. The next planned revision date for this Air Quality Action Plan is 2011. By this time, much more information will be known about the likely impact of the proposed M1 widening, as the project is scheduled for public enquiry in 2008 and scheduled for construction by 2011. However, revision may become necessary as a result of policy changes or other developments

CHAPTER 5 AIR QUALITY ASSESSMENT IN ROTHERHAM

Rotherham MBC's Further Air Quality Review and Assessment Report³ (2002) confirmed predictions that the long-term NO₂ standard would not be met in the Air Quality Management Area (AQMA) in Rotherham adjacent to the M1. The boundaries of the original two areas of the Rotherham AQMA have remained unchanged and an additional area of exceedence was identified in Rotherham in Wales, close to the M1 between junctions 31 and 32. DEFRA accepted the findings of Rotherham's Further Assessment report.

Source apportionment analysis indicated that the major source leading to an exceedence of the NO₂ target is road traffic. This traffic is largely concentrated on the trunk road network and one major source of emissions in the Rotherham M1 area of exceedence is motorway traffic. Emissions elsewhere in the country, and, indeed, from other countries in Europe, also contribute to the 'background' pollution levels.

Declaration of the Air Quality Management Area (AQMA) in Rotherham

An AQMA was declared in Rotherham against the target for annual average NO₂ on 1st January 2002. The area over which targets are forecast to be exceeded is much smaller than the AQMA area. The AQMA was declared along a suitable combination of physical features and administrative boundaries after consultation. The single biggest source within a distance of 100 metres of the M1 is motorway traffic itself. Further away, the motorway has a much lesser impact on local pollutant concentrations.

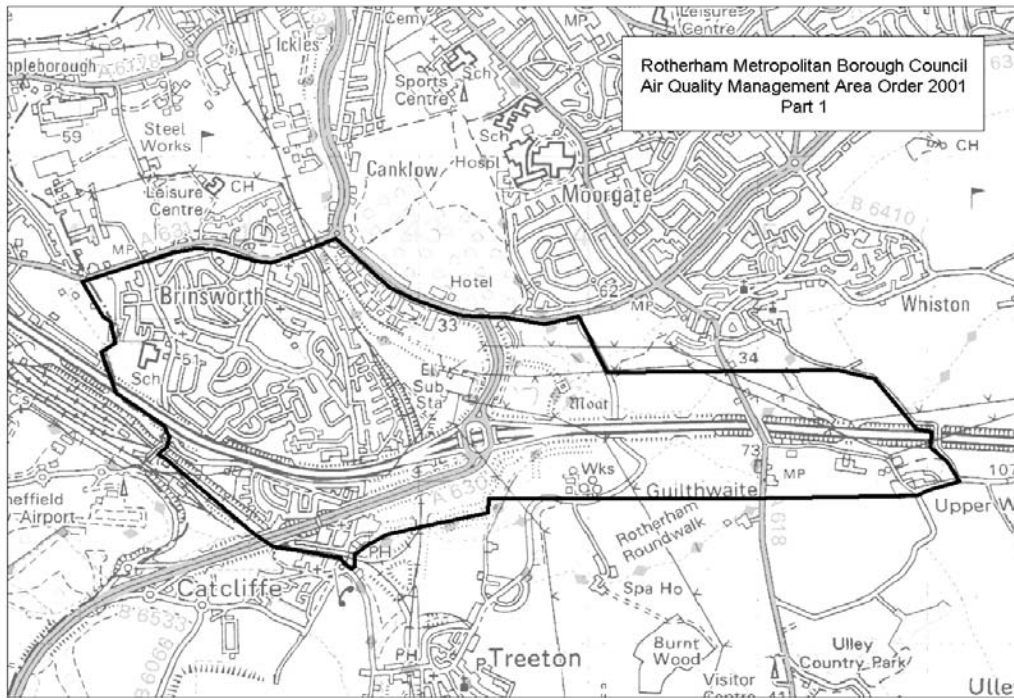
Summary details of the Rotherham M1 AQMA (2002) are as follows:

- 5.87km²
- 11,440 residents
- 1,000 estimated working population
- 5 schools
- 1 residential care home
- 146,800 estimated annual average daily trips (AADT)

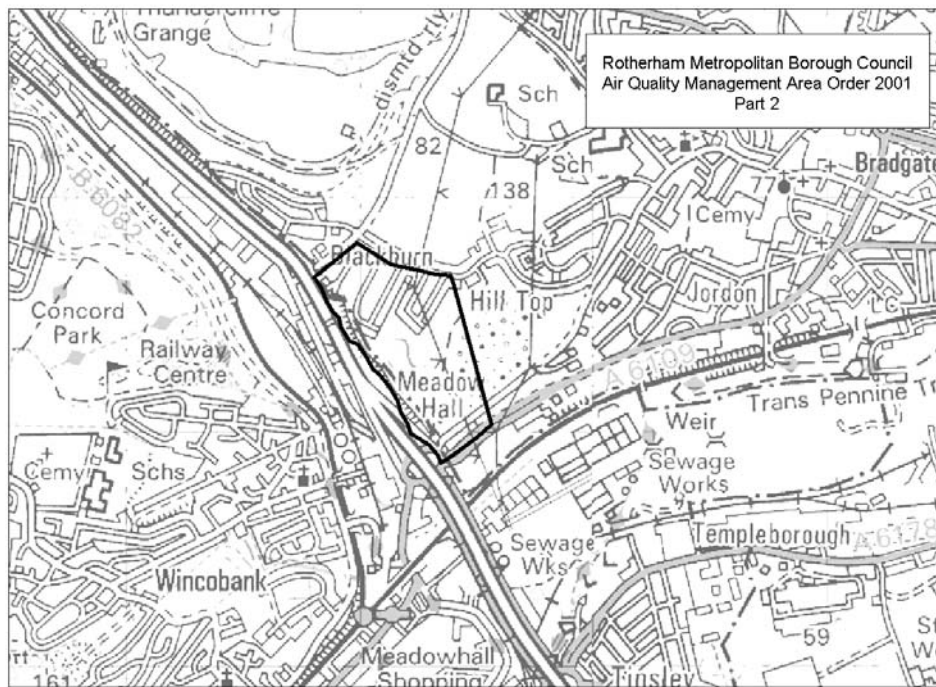
The locations of AQMAs adjacent to the M1 in Rotherham are shown in maps 1-2 below.

³ Stage Four Air Quality Review and Assessment Report, Rotherham MBC-Environmental Services, December 2002

Map 5.1 of M1 AQMA (2002) part 1



Map 5.2 of M1 AQMA (2002) part 2



Source Apportionment – What Causes the Problems?

Rotherham M1 AQMA

The relative NO_x emissions from traffic, industrial point sources, area sources, and heavy and light vehicles have been assessed to apportion the air quality problems in the Rotherham M1 AQMA to the sources responsible for them. The results are shown below.

Rotherham's source apportionment work has been carried out using Rotherham MBC's Airviro dispersion modelling system to determine the relative contributions of different types of source at sensitive receptors to the total NO_x concentration at that receptor. Results for Derwent Crescent in Brinsworth, 20 metres from the M1, are shown in Table 5.1 **Error! Reference source not found.** Further results are shown in Tables 5.2 and 5.3 **Error! Reference source not found.** which show an **Error! Reference source not found.** estimation of the contribution of the motorway to the total concentration of NO_x at different sites.

Table 5.1. - Source apportionment results for Derwent Crescent, Brinsworth

Source	Modelled contribution to total NO _x at Derwent Crescent, Brinsworth
Non motorway traffic (total)	10%
Motorways	34%
Industrial Point sources	5%
Area sources	18%
Background	33%

At the receptor location 20 metres from the M1 motorway at Derwent Crescent, Brinsworth, approximately 34% of NO_x originates from the M1 motorway.

Modelling results show that currently a reduction of approximately 9 µg/m³ nitrogen dioxide as an annual mean is needed to meet the air quality objectives at the worst case locations with relevant exposure of sensitive receptors. The following tables show the sources which contribute to the overall level of NO_x at a sensitive receptor and the reduction in NO_x required to meet the national air quality objective for annual mean NO₂. It is assumed that 34% of the NO_x at these locations results from motorway emissions, based on the results in Table 5.2.

Table 5.2 – Sources of NO_x at each receptor

Receptor	Modelled Contributors to NO _x levels (%)			
	Industry	M1	Other roads	Background and area sources
Derwent	5	34	10	51

HOW ACTION PLAN MEASURES ARE EXPECTED TO WORK TOWARDS ACHIEVING THE NAQS OBJECTIVES AND EU LIMIT VALUES

The contribution towards meeting the objectives of the measures outlined in this Rotherham M1 Air Quality Action Plan is expected to be between 2 and 4 $\mu\text{g}/\text{m}^3$ annual mean nitrogen dioxide depending on the location within the M1 AQMA by 2011, assuming the M1 motorway continues to be made of 3 lanes by 2011.

An assessment of when the annual mean objective and EU limit value for nitrogen dioxide will be met is complicated by the proposed widening of the M1.

This will need to be re-assessed annually at the time of the Annual Progress Reports, subject to further information being made available by the Highways Agency who have commissioned their own modelling and assessment of mitigation measures.

Table 5.3 – NO_x reduction required to achieve Air Quality Objectives at selected sensitive receptor in 2010

Receptor	Monitored NO ₂ 2006 ($\mu\text{g}/\text{m}^3$)	Modelled NO ₂ 2010 ($\mu\text{g}/\text{m}^3$)	* NO _x reduction required by 2010 to meet objective (%)	NO _x reduction applied M1 only by 2010 to meet objective (%)	NO _x reduction applied M1 and local roads by 2010 to meet objective (%)
Derwent Crescent	49.3	45.1-47.1	9-15	28-46	30

The table above illustrates that the reduction in NO_x emissions of around 15% is required to meet the nitrogen dioxide annual average objective of 40 $\mu\text{g}/\text{m}^3$ at certain sensitive receptors in Brinsworth. Once source apportionment results are taken into account, this is equivalent to a significant reduction in NO_x from the M1, if that was to be the only source targeted. Measures which address as wide a range of sources as possible are predicted to be most effective in improving future air quality in this AQMA.

Consultation

The consultation exercise leading to the production of this revised Rotherham M1 Air Quality Action Plan resulted in changes to the document including provision of an up to date description of the air quality problem, a revision of target dates, greater detail with respect to the quantification of air quality improvements, an estimate of expected progress towards meeting NAQS objectives, and more emphasis on land use and development policies which can potentially have a significant impact on air quality.

REFERENCES

Review and assessment of air quality in Rotherham

Information on air quality assessment in Rotherham found at the website:
www.rotherham.gov.uk

National Air Quality Strategy

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, A Consultation Document, Defra, April 2006

Guidance on action planning has been produced by DEFRA and the Welsh Assembly (jointly) and by the NSCA in an initiative supported by DEFRA:

Part IV of the Environment Act 1995: Local Air Quality Management Draft Policy Guidance. DEFRA/Welsh Assembly, 2002.

Air Quality Action Plans: Interim Guidance for Local Authorities, NSCA, 2000.

Air Quality: Planning for Action. Part 2 of the NSCA's Guidance on the Development of Air Quality Action Plans and Local Air Quality Strategies. NSCA, 2001.

Air Quality Action Planning Helpdesk, funded by DEFRA and run by Casella Stanger and TTR (Transport Travel Research) Ltd.:
www.stanger.co.uk/jointprojects/DEFRAHome.asp?jointprojectid=10

Further information on the national air quality strategy can be found at
www.defra.gov.uk/environment/airquality/index.htm

Further guidance for local authorities can be found at:

www.airquality.co.uk/archive/reports/reports.php?action=category§ion_id=6

In developing the strategy, DEFRA has commissioned a substantial amount of research, which is accessible at:

www.airquality.co.uk/archive/reports/reports.php?action=category§ion_id=2

Amongst this work were cost-effectiveness studies for PM₁₀ and for NO_x: Holland et al (2001), The costs of reducing PM₁₀ and NO₂ emissions and concentrations in the UK: Volume I, PM₁₀. Report for UK Departments of Environment, Food and Rural Affairs (DEFRA) and Trade and Industry (DTI).

www.aeat.co.uk/netcen/airqual/reports/naqs2001/aeat-env-r-0342.pdf .

Volume II, NO₂. Report for UK Departments of Environment, Food and Rural Affairs (DEFRA) and Trade and Industry (DTI).

The Environment Agency has also provided guidance on improving urban environments in the documents 'Our Urban Future: Putting the environment at the heart of urban renewal' and the more detailed assessment 'The Urban Environment in England and Wales'.

Information on EU Legislation

Information on the legislation developed on air quality by the European Commission can be accessed through:

<http://europa.eu.int/comm/environment/air/index.htm>

Local Plans and Other Documents

South Yorkshire Local Transport Plan 2006-2011.

Rotherham MBC, Environmental Health: Stage Two Three Review and Assessment of Air Quality Report, 2000

South Yorkshire Bus Strategy, South Yorkshire Local Transport Plan, September 2001.

South Yorkshire Passenger Transport Executive: Park and Ride – Criteria and Sites. Draft Executive Summary, December 2002. Produced for SYPTE by Halcrow Group Limited.

South Yorkshire Vehicle Emissions Testing Partnership. Application for Funding, October 2002.

Strategic Economic Zone Integrated Development Plan, Yorkshire Forward, April 2001.

Information on the M1 Corridor Clean Air Partnership can be found at the website: www.care4air.org

Rotherham Unitary Development Plan, RMBC, June 1999

Rotherham Core Strategy Preferred Options, RMBC, January 2007

Guidance on Consultation

Arup (1999) Good practice Guide: Air quality and land use planning. A report prepared by Arup Environmental for the Royal Town Planning Institute. Printed by NSCA: Brighton

Bush, J., S. Moffatt, and C. Dunn (2001) "Keeping the public informed? Public negotiation of air quality information" *Public Understanding of Science* Vol.10: 213–229

Cinderby, S. (1999) "Geographical Information Systems for Participation: The Future of Environmental GIS?" *International Jnl. Environment and Pollution* Vol.11(3).

Forrester, J. (1999) "The Logistics of Public Participation in Environmental Assessment" *International Journal of Environment and Pollution* Vol.11(3): 316-330

NSCA (National Society for Clean Air and Environmental Protection) (1999) *Consultation for Local Air Quality Management: the How To Guide* Brighton: NSCA

Renn O., Webler T., and Wiedermann P. (eds) (1995) *Fairness and Competence in Citizen Participation: evaluating models for environmental discourse*. Dordrecht: Kluwer Academic Publishers.