



Local Air Quality Management

Air Quality Action Plan for Rushmoor Borough Council



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Rushmoor Borough Council

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This report is available to download (as .pdf) from Rushmoor's website at:
<http://www.rushmoor.gov.uk/index.cfm?articleid=810>

This report should be read with specific reference to Rushmoor Borough Council's
'Further Review & Assessment, 2005' report.

DEFRA ACTION PLAN REQUIREMENTS COMPLIANCE CHECKLIST

This checklist has been introduced to indicate where the work expected by defra has been undertaken in relation to our Action Plan.

Work area	Included or considered	Location within the report and comments
Process Consideration of Policies Adherence to Guidelines		
• Have Statutory Consultees been consulted?	Yes	Section 5.4
• Have other LA departments been consulted?	Yes	Section 5.4
• Statement of problem causing AQMA	Yes	Section 2.2 & 3
• Have the principle sources of pollutants causing the exceedance been identified?	Yes	Section 3
• Have other LA plans/policies been considered?	Yes	Section 7.1.5 & 8
• Has an options timescale been included?	Yes	Section 6 & 7
• Have cost of options/plan been set out?	Yes	Section 6 & 7
• Have impacts been assessed?	Yes	Section 6 & 7
Process – Checklist of Measures		
• Have options been considered?	Yes	Section 6 & 7
• How many options have been considered?	Twenty eight	Section 6 & 7
• Have transport impacts been assessed?	Yes	Section 6 & 7
• Have air quality impacts been assessed – modelled or measured?	Yes	Section 6 & 7
• Have Socio-economic impacts been assessed?	Considered	Section 6 & 7
• Have other environmental impacts been assessed? (noise)	Yes	Section 6 & 7
• Have costs been considered?	Yes	Section 6 & 7
Appropriateness and Proportionality		
• Do measures seem appropriate to the problem?	Yes	Section 6 & 7
• Have the measures been assessed?	Yes	Section 6 & 7
• Are the measures likely to achieve the stated goal?	Not individually, but several together will.	Section 6 & 7
• Have the wider impacts been appraised appropriately?	Yes	Section 6 & 7
• Was the method of assessing costs appropriate?	Yes	Section 5.4, 6 & 7
• Is it likely for LAQM objectives to be met?	Yes	Throughout
• Do the chosen measures comply with wider Government Policies	Yes	Section 2
Implementation		
• Are measures realistic in light of the objective deadlines?	Yes	Throughout
• Have responsibilities been assigned to the relevant party?	Yes	Section 6 & 7
• Does the assigned party have the necessary powers?	Yes	Section 6 & 7
• Has financing been secured and who will pay?	Not for all options	Section 6, 7 & 9

EXECUTIVE SUMMARY

In the UK, air pollutants come from a range of sources; these include transport (mainly road traffic), industry, domestic sources, aviation and natural sources.

The Environment Act 1995 places a duty on local authorities to review and assess the air quality in their area for key pollutants against national standards and objectives laid down in the Air Quality (England) Regulations 2000 and Air Quality (England)(Amendments) Regulations 2002.

Following the identification of a likely exceedance of the annual nitrogen dioxide (NO₂) Air Quality Objective, Rushmoor designated an Air Quality Management Area (AQMA), in November 2004 between junctions 4 & 4a of the M3 motorway, extending 51 metres either side of the centreline. A map of this area is shown in Section 2.2. As a result we are required to prepare this Air Quality Action Plan.

The action plan indicates what measures have been considered for reducing NO₂ levels within the AQMA to meet the objective. It includes simple estimates of the costs involved in implementing each measure, the positive and negative effects of each measure both inside and outside of the AQMA and the feasibility of each action on a cost-effective basis. Other non air quality issues such as reduction in noise levels, improved road safety etc have also been considered. The estimates of cost and effectiveness categorised into low, medium or high. (See Appendix A).

Rushmoor has worked with external organisations, and internal departments, in identifying the feasible measures included in the action plan and which organisations are responsible for implementing them.

This action plan has identified two main categories of actions that affect the pollution levels within the AQMA and the borough. These are direct actions and indirect actions. The report concludes there are twenty feasible options out of twenty-eight that were considered and these are summarised in Appendix B.

AIR QUALITY ACTION PLAN REPORT CONTENTS

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1 STRUCTURE OF THIS REPORT

This report is structured as follows:

- Section 1** Overview of the sections in this report
- Section 2** Introduction & purpose of the action plan
- Section 3** Sources of pollution in the Air Quality Management Area
- Section 4** Health effects of nitrogen dioxide
- Section 5** Air quality action plan
- Section 6** Possible direct actions to improve air quality within the AQMA
- Section 7** Possible indirect actions to improve air quality within the AQMA
- Section 8** Community strategy for Rushmoor
- Section 9** Option funding
- Appendices** Air quality action plan matrices

2 INTRODUCTION & PURPOSE OF THE ACTION PLAN

2.1 Legislation & Key Pollutants

Modern day pollution sources, such as from industry and road traffic emissions, led to the development of a European Union directive on air quality. The directive was adopted by the UK Government and resulted in the Environment Act 1995. This led to the national Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2000.

The national strategy has been adopted by the Government as a statement of its policies in respect of the assessment and management of air quality. In particular, it set standards for eight pollutants, based on the scientific and medical evidence of the health effects of each pollutant.

The Air Quality (England) Regulations 2000¹ and the Air Quality (England)(Amendment) Regulations 2002² prescribe health based Air Quality Objectives (AQO) for seven of the eight pollutants. These pollutants are:

- Benzene
- 1,3-butadiene
- Carbon monoxide
- Lead
- Nitrogen dioxide
- PM₁₀ Particulates
- Sulphur dioxide
- Ozone

Ozone is not one of the pollutants that are dealt with at local government levels due to the trans-boundary nature of the pollutant. It should be dealt with at National and International level.

¹ Air Quality (England) Regulations 2000, DETR, 2000

² Air Quality (England) (Amendments) Regulations 2002, defra, 2002

The air quality objectives for these pollutants are shown below.

Table 2.1: A summary of the current UK Air Quality Objectives:

Pollutant	Objective	Measured as	To be achieved by
Benzene All Authorities	16.25 μgm^{-3}	Running Annual Mean	31 December 2003
Benzene Authorities in England and Wales only	5 μgm^{-3}	Annual Mean	31 December 2010
Benzene Authorities in Scotland and Northern Ireland only ^a	3.25 μgm^{-3}	Running Annual Mean	31 December 2010
1,3-Butadiene	2.25 μgm^{-3}	Running Annual Mean	31 December 2003
Carbon monoxide Authorities in England, Wales and Northern Ireland only ^a	10.0 mgm^{-3}	Maximum daily running 8-hour mean	31 December 2003
Carbon monoxide Authorities in Scotland only	10.0 mgm^{-3}	Running 8-hour mean ^b	31 December 2003
Lead	0.5 μgm^{-3}	Annual Mean	31 December 2004
	0.25 μgm^{-3}	Annual Mean	31 December 2008
Nitrogen dioxide	200 μgm^{-3} Not to be exceeded more than 18 times per year	1 Hour Mean	31 December 2005
	40 μgm^{-3}	Annual Mean	31 December 2005
Nitrogen Oxides **	(V) 30 μgm^{-3}	Annual Mean	31 December 2000
Ozone *	100 μgm^{-3}	Running 8 hour Mean Daily maximum of running 8 hr mean not to be exceeded more than 10 times per year	31 December 2005

Pollutant	Objective	Measured as	To be achieved by
Particles (PM₁₀) (gravimetric) ^c All authorities	50 µgm ⁻³ Not to be exceeded more than 35 times per year	24 Hour Mean	31 December 2004
	40 µgm ⁻³	Annual Mean	31 December 2004
Particles (PM₁₀) Authorities in Scotland only ^d	50 µgm ⁻³ Not to be exceeded more than 7 times per year	24 Hour Mean	31 December 2010
	18 µgm ⁻³	Annual Mean	31 December 2010
Sulphur dioxide	266 µgm ⁻³ Not to be exceeded more than 35 times per year	15 Minute Mean	31 December 2005
	350 µgm ⁻³ Not to be exceeded more than 24 times per year	1 Hour Mean	31 December 2004
	125 µgm ⁻³ Not to be exceeded more than 3 times per year	24 Hour Mean	31 December 2004
	(V) 20 µgm ⁻³	Annual Mean	31 December 2000
	(V) 20 µgm ⁻³	Winter Mean (01 October - 31 March)	31 December 2000

Notes:

a. In Northern Ireland none of the objectives are currently in regulation. Air Quality (Northern Ireland) Regulations are scheduled for consultation early in 2003.

b. The Quality Objective in Scotland has been defined in Regulations as the running 8-hour mean; in practice this is equivalent to the maximum daily running 8-hour mean.

c. Measured using the European gravimetric transfer sampler or equivalent.

d. These 2010 Air Quality Objectives for PM₁₀ apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002. Provisional elsewhere.

µgm⁻³ - micrograms per cubic metre

mgm⁻³ - milligrams per cubic metre

* Ozone is not included in the Regulations

** Assuming NO_x is taken as NO₂

(V) These standards are adopted for the protection of vegetation and ecosystems. All of the remainder are for the protection of human health.

2.2 Local Air Quality Management History in Rushmoor

The Environment Act 1995³ requires authorities to carry out periodic reviews of the air quality in their areas and to assess present and future air quality against the seven objectives in the Regulations. The first round of air quality review and assessments was carried out in Rushmoor in four stages between 1999 and 2002. It resulted in the declaration of an Air Quality Management Area (AQMA) around the M3 motorway. After further detailed modelling work showed no exceedences were likely in the AQMA, it was revoked in 2002.

Nationally, the experience from the first round was valuable in shaping how councils should proceed with further air quality review and assessments through to 2010. New policy and technical guidance provides councils with a more prescriptive, consistent and streamlined approach to future work.

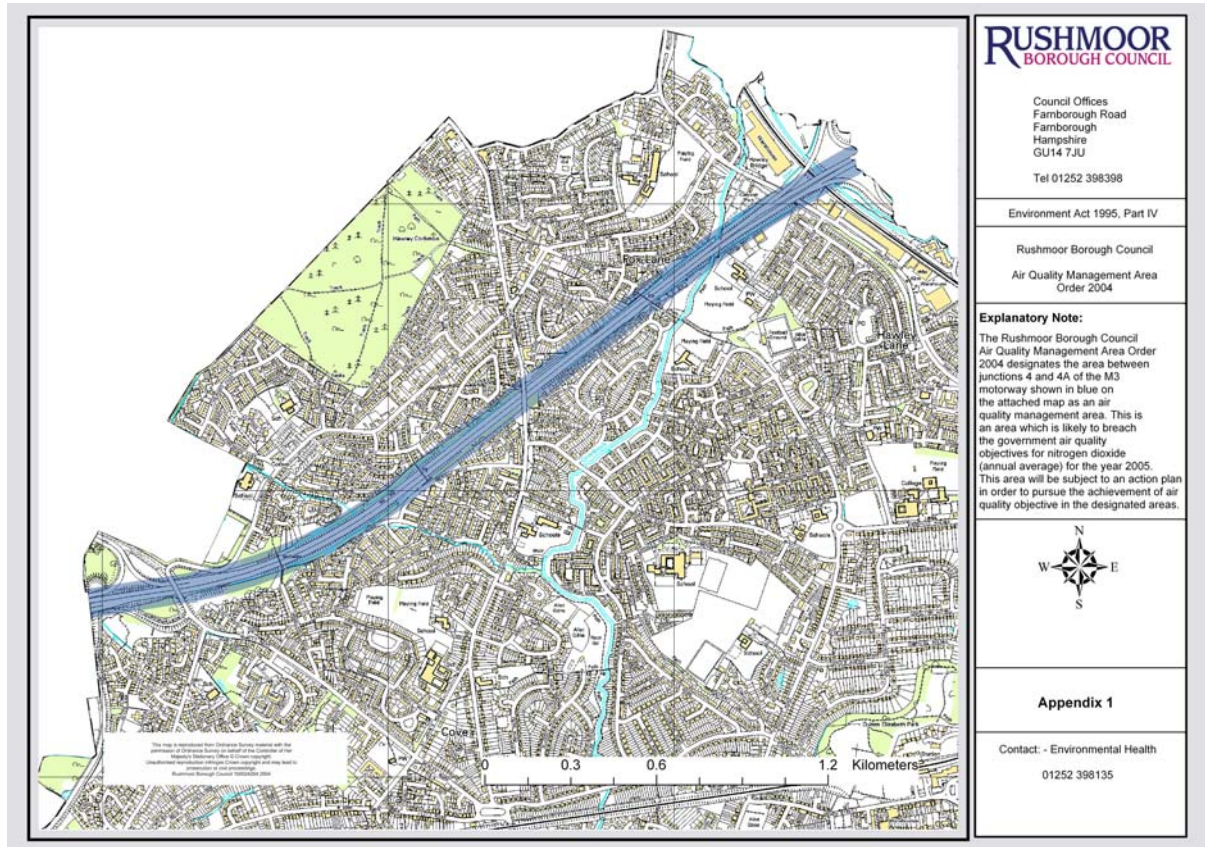
The second round of air quality review and assessments was carried out in Rushmoor in three stages between 2003 and 2005. It resulted again in the declaration of an AQMA between Junctions 4 & 4a and extending 51 metres either side of the centreline of the M3 motorway, shown below in Figure 1. Detailed modelling and monitoring work showed that the annual nitrogen dioxide (NO₂) pollution levels would only just meet the objective level. Therefore, due to some expected uncertainty in the monitoring and modelling results, it was considered prudent to leave the AQMA order in force until such time that there will be no further chance of NO₂ pollution levels exceeding the objective.

The third round of air quality review and assessments started with the completion of an Updating and Screening Assessment⁴ report, which was completed in April 2006. This report confirmed that the only area of Rushmoor that needed to go on to a Detailed Assessment was the AQMA.

³ Environment Act 1995, HMSO, 1995

⁴ Updating Screening Assessment, Rushmoor Borough Council, 2006

Figure 1: Air Quality Management Area in Rushmoor, 2004



With the designation of the AQMA, we are required, under the Environment Act 1995, Sec 84, to prepare an Air Quality Action Plan (AQAP).

This report represents Rushmoor's AQAP which contains information about actions that were considered and deemed feasible, either as new measures or existing. When these measures are implemented they will pursue the annual nitrogen dioxide air quality objective within the AQMA.

3 SOURCES OF POLLUTION IN THE AQMA

There are various sources of nitrogen dioxide (NO₂) pollution, which can be placed into four categories that are: Industrial, Domestic, Road traffic & Background.

There are industrial sources within the borough but these will only be considered as part of the background source because they are not near enough the Air Quality Management Area (AQMA) to directly effect the pollution concentrations in the AQMA.

Domestic sources of NO₂ consist of emissions from combustion sources such as hearth fires and central heating. Hearth fires are very few and far between as most residential properties have gas fired central heating. However, with efficient modern boilers NO₂ emissions are low and can be considered as part of the background source.

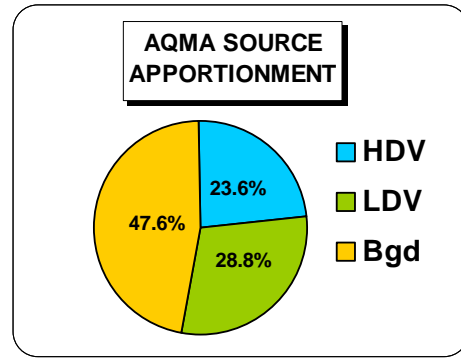
The background concentration of NO₂ consists of emissions from many sources and as a result any measures taken locally by Rushmoor and others to reduce pollution will have only a minimal effect on the concentration.

Road traffic is by far the largest source of NO₂ in the country and is the main source of NO₂ within the AQMA. Road traffic can be categorised into Light Duty Vehicles (LDV) i.e. cars & vans and Heavy Duty Vehicles (HDV) i.e. lorries & buses.

Following designation of the AQMA in November 2004, Rushmoor undertook a Further Review & Assessment, completed in November 2005, of the air quality within the AQMA.

The Further Review & Assessment considered source apportionment for the AQMA. The breakdown of this is:

<u>Sources</u>	<u>% Total</u>	<u>Proportion of pollutant ($\mu\text{g}\text{m}^{-3}$)</u>
HDV	23.6	8.6
LDV	28.8	10.5
Background	47.6	17.3
Total	100.0	36.4



Source apportionment is important as an indication of the areas that need to be targeted in the AQAP. Actions taken to reduce the pollution levels will have only a very small effect, if any, on the background concentration. The figures below represent the proportions of pollution from traffic only.

<u>Source</u>	<u>% of total</u>
HDV	45
LDV	55

It can be seen that despite the HDV accounting for only 6% of the total traffic flow the contribution to NO_2 levels by HDVs is 45%. Therefore, any actions on road traffic may have a greater influence on pollution levels if it is targeted at HDV traffic.

The NO_2 concentration at a point that represents the nearest receptor to the source within the AQMA for 2005 is $38.8 \mu\text{g}\text{m}^{-3}$. The Further Review & Assessment identified that the concentration level to be achieved should be $37 \mu\text{g}\text{m}^{-3}$. This means a reduction of $1.8 \mu\text{g}\text{m}^{-3}$ is required to ensure the NO_2 annual Air Quality Objective (AQO) is met within the AQMA.

Although there are various permutations that can be applied to the HDV and LDV sources, the simple scenario is that if HDV is responsible for 45% of the NO_2 this equates to $0.8 \mu\text{g}\text{m}^{-3}$ of the required reduction and LDV being responsible for $1.0 \mu\text{g}\text{m}^{-3}$ of the reduction.

4 HEALTH IMPACTS OF NITROGEN DIOXIDE

Road Vehicles are responsible for over 50% of the emissions of nitrogen oxides (NO_x) in the UK. Burning fossil fuels in air produces these oxides. Both nitric oxide (NO) and nitrogen dioxide (NO₂) are produced, with nitric oxide being the major primary pollutant.

This is the first point in a complex series of chemical reactions, involving a range of other pollutants, including ozone. Together the two oxides are referred to as NO_x. The concentration of the different elements of NO_x will depend on the oxidising capacity of the local atmosphere.

Nitrogen dioxide has been identified as having a number of possible adverse health effects, focused around the respiratory system, in both asthmatic and non-asthmatic subjects.

Short-term exposure can increase reactivity to allergens, such as pollen. In some individuals, high levels of nitrogen dioxide can precipitate or exacerbate episodes of asthma. Exposure of children to nitrogen dioxide may increase the risk of respiratory infections and possibly lead to poorer lung function in later life.

5 AIR QUALITY ACTION PLAN

Following the designation of the AQMA in November 2004, we were required to complete an Air Quality Action Plan within 18 months, under section 84(2) of the Environment Act 1995, **in pursuit of the annual nitrogen dioxide Air Quality Objective**. The aim of the plan is to minimise the health effects of the pollutant, nitrogen dioxide (NO₂), by implementing measures that will reduce the NO₂ concentration within the AQMA.

Air Quality Action Plans (AQAP) 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 (AQO) through the use of powers they have available.

5.1 Air Quality Action Plan

In the defra Policy Guidance LAQM.PG(03)⁵, Section 1.74, it states “*Local Authorities are not obliged to meet the objectives but they must show that they are working towards them*”.

The AQAP should include:

- Quantification of the pollutant source contributions;
- Evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility;
- How Rushmoor will use its available powers and also work with other organisations in **pursuit** of the AQO;
- Clear timescales to implement the measures in the plan;
- Quantification of the expected impacts of the proposed measures and whether they are sufficient to meet the AQO;
- How Rushmoor will monitor and evaluate the effectiveness of the plan.

⁵ Policy Guidance LAQM.PG(03), defra, 2003

5.2 Air Quality Action Plan Aims & Objectives

The aim of the action plan is to identify measures which when implemented will minimise the health effects on people from pollution emitted from a source. This will be achieved through joint agreement between Rushmoor and other responsible organisations to implement measures that will reduce the level of pollution causing the AQMA. In Rushmoor, the pollution of concern is nitrogen dioxide.

The source of pollution within the AQMA is road traffic using the M3 motorway. It has been recognised that the actions that can be taken to reduce pollution levels can be placed into two categories:

- Direct actions that effects traffic using the M3 motorway.
- Indirect actions that applies to traffic using the surrounding area of the motorway, which may contribute to reducing the background pollution level of NO₂. These actions may well provide other benefits including improving air quality elsewhere within the borough.

The objectives of Rushmoor's Air Quality Action Plan are:

- To identify measures that can be taken to reduce the nitrogen dioxide concentrations within the Air Quality Management Area so that the NO₂ annual Air Quality Objective is achieved.
- To improve the air quality within the Borough of Rushmoor as a whole.
- To provide and update air quality information available to the public and other organisations that may require it through various media, especially Rushmoor's website.
- To ensure that Rushmoor works with Hampshire County Council and neighbouring Local Authorities to encourage a uniform approach to Local Air Quality Management within the Blackwater Valley.
- To ensure that council activities and policies, where appropriate, are considered with reference to their effect on air quality within the borough.

5.3 Timescales

It is a legal requirement that an action plan is completed following the designation of an Air Quality Management Area and defra expects these to be completed within 18 months of the designation.

The action plan should be developed with regard to the Further Review & Assessment (FR&A)⁶ of the air quality within the AQMA. The FR&A quantifies the pollutant source contribution and assesses the reductions in pollution concentrations required. This information can be used in the action plan to aid the choice of measures that can be implemented to achieve the AQAP objectives.

For the measures to be implemented, realistic timescales have to be identified in the action plan. The matrix in Appendix A shows all the action plan options that were considered and their outcomes.

5.4 Air Quality Action Plan Consultees

The statutory consultees for this action plan are:

- Secretary of State
- The Highways Agency
- Hampshire County Council
- Surrey County Council
- Surrey Heath Borough Council
- Hart District Council
- Hart & Blackwater Valley Primary Care Trust
- Rushmoor Borough Council – Planning
- Rushmoor Borough Council – Street Scenes (Community Services)
- Rushmoor Borough Council – Strategy & Communication
- Rushmoor Borough Council – Environmental Health Services

⁶ Further Review & Assessment, Rushmoor Borough Council, 2005

We have consulted widely during the development of this action plan. In December 2004, we had a seminar attended by all likely action plan stakeholders.

The seminar started by setting the background and then highlighted the way forward for developing the action plan, including initial discussions on the costs of implementing these options. The seminar ended with workshops where the attendees put forward potential measures that could be included in the action plan. These ideas have since been assessed and expanded into the matrix and considered in the action plan.

Draft versions of this action plan have been circulated to the statutory consultees for their comments. This report will also be presented to Rushmoor's 'Environment Policy & Review Panel' and 'Cabinet'.

5.5 Action Plan Matrix

It is through these consultations that the action plan matrix has been developed. The matrix considers a large variety of measures that could be implemented to reduce the NO₂ concentrations levels within the AQMA. The matrix highlights those measures that are not practical on cost-effectiveness and feasibility as well as, more importantly, those measures that can be implemented.

The feasible options matrix is in Appendix B. Following defra guidance the 'effects of the measures on air quality' and the likely 'costs involved in implementing these measures' are categorised into Low, Medium or High bandings and these are given an index score. Multiplying the air quality improvement index by the cost index scores the ranking. The higher the ranking number the more feasible the option.

The maximum ranking score is nine, which represents high air quality improvements at low cost. As can be seen in the feasible options matrix, the highest scores are three, which represents low air quality improvements at low cost or high air quality improvements at high cost.

6 POSSIBLE DIRECT ACTIONS TO IMPROVE AIR QUALITY WITHIN THE AQMA

The main source of the nitrogen dioxide pollution within the Air Quality Management Area (AQMA) is road traffic using the M3 motorway. There are a large variety of vehicles using the motorway so source apportionment is important information.

6.1 Source apportionment

Source apportionment was discussed earlier in Section 3, and knowing what effects the traffic has on pollution concentrations helps in targeting the measures in the Air Quality Action Plan.

6.2 Direct actions within the AQMA

The Highways Agency is the organisation that has the responsibility of running motorways and trunk roads in the country. Therefore, measures that will have a direct effect on the pollution concentrations within the AQMA will be the responsibility of the Highways Agency.

The direct actions that have been considered are:

- Option 1 - Speed regulation and enforcement**
- Option 2 - Multiple-occupancy lane and enforcement**
- Option 3 - Crawler lanes**
- Option 4 - Motorway tolls**
- Option 5 - Improve road signage**
- Option 6 - Enforce 'drive on the left' (Highway code)**
- Option 7 - Tree planting**

All these actions relate to measures on the motorway.

6.2.1 Speed regulation and enforcement (Option 1)

OBJECTIVES

To reduce nitrogen dioxide emissions from road traffic through speed reduction, either through permanent speed control or through variable speed control as traffic conditions dictate.

SCENARIO

- ★ Reduce the average speed of the traffic flow on the M3 from 70 mph (112 kph) to 60 mph (96 kph).
- ★ Reduce the average speed of the traffic flow on the M3 from 70 mph (112 kph) to 50 mph (80 kph).

RESPONSIBLE ORGANISATION

The Highways Agency will be responsible for the implementation and maintenance of this action. The police will be responsible for the enforcement of the action.

NON AIR QUALITY IMPACTS

- ★ May improve road safety on the M3
- ★ Reduce fuel consumption
- ★ Reduced carbon dioxide emissions
- ★ May reduce noise levels at local residences
- ★ Possible increased journey times when traffic is free flowing. However, in heavily trafficked roads reduced traffic speed can improve the traffic flow and thus reduce journey times.

PERCEPTIONS

May be seen as restricting freedom of travel. It will only be effective with enforcement and resources.

EFFECTIVENESS

These scenarios were assessed in Rushmoor's Further Review & Assessment, November 2005, using an advanced forecasting model, (Breeze Roads). The average nitrogen dioxide reduction across the section of the M3 between junctions 4 & 4a at relevant receptor points is:

- ★ At 60 mph - reduction of $2.0 \mu\text{gm}^{-3}$
- ★ At 50 mph - reduction of $3.1 \mu\text{gm}^{-3}$

Both of these scenarios would achieve the required NO_2 reduction of $1.8 \mu\text{gm}^{-3}$ on 2005 NO_2 monitored concentrations.

As can be seen from the modelling results a speed reduction is able to account for all the required NO_2 reduction within the AQMA.

COST AND FEASIBILITY

Both scenarios to reduce traffic speed on the motorway in this option require the approval of the Highways Agency. There are two methods that could be used to achieve this speed reduction: A permanent speed limit reduction would be more cost effective of these two solutions; Variable speed limits are expensive to implement and to maintain. The speed reduction will also require effective enforcement.

The cost involved in permanent speed limits on this section of the M3 would be low as this involves installing fixed speed signs at the roadside.

The cost involved in installing variable speed signs along this stretch of the M3 would be very high. Gantries would have to be installed across the motorway, and if required, the need to compulsorily purchase some land to locate these signs plus the additional costs for maintenance.

The cost of enforcement is also a factor that has to be accounted for.

If the variable speed signs are to be used, this option is not feasible, as it will take several years to implement at high cost so it is not considered to be cost effective

If a permanent speed limit is implemented this option is feasible as the costs will be low to install the signs and would not take years to implement. However, the economic costs would be high.

SUMMARY

Option 1:

- ★ is possibly the most effective way of reducing the NO₂ concentrations.
- ★ is possibly the most expensive option to implement, maintain and enforce.
- ★ requires the Highways Agency approval.
- ★ this option is not cost-effective and is not likely to be implemented if variable speed signs are used.
- ★ is feasible and cost effective if fixed speed reduction signs are used.
- ★ may incur high economic costs.
- ★ this option will provide high improvements.

6.2.2 Multiple-occupancy lanes and enforcement (Option 2)

OBJECTIVES

To reduce nitrogen dioxide emissions from road traffic through reducing the number of vehicles using the motorway. This may need to operate only during peak hours.

SCENARIO

- ★ Cars with more than one passenger can use a designated lane on the motorway.

RESPONSIBLE ORGANISATION

The Highways Agency will be responsible for the implementation of this option. The police will be responsible for the enforcement of the action.

NON AIR QUALITY IMPACTS

- ★ May speed multiple-occupancy vehicles through congested traffic.
- ★ May reduce traffic volumes using the motorway.
- ★ May reduce the NO₂ concentrations from the motorway traffic source.
- ★ Will reduce the number of motorway lanes from three to two for other traffic to use.
- ★ May cause congestion on the other two lanes.

PERCEPTIONS

May be seen as favouritism that could cause congestion to others. It will only be effective with enforcement and resources.

EFFECTIVENESS

Using an advanced air quality forecasting model (Breeze Roads) it was found that a reduction of approximately 6.4% in the traffic flow would be required (base traffic flow figures 2004) to achieve the required NO₂ reduction.

COST AND FEASIBILITY

Financial costs would be incurred in segregating the multiple-occupancy lane and its maintenance together with its enforcement.

Multiple-occupancy would reduce travel costs to those sharing the vehicle.

This action requires the approval of the Highways Agency. The cost involved in implementing this option would be high. The cost of enforcement would also have to be accounted for.

There is also the economic cost and practicality of this option as it removes one of the three lanes from general traffic use, which may cause congestion in the two remaining lanes. The effects of this option could be minimised by only applying it to peak-hour periods. The cost of advertising this option through the media and road signage would have to be considered.

Although this option is feasible, it is not cost effective in achieving the necessary traffic reduction to obtain the required drop in NO₂ concentration.

SUMMARY

Option 2:

- ★ will be difficult to achieve.
- ★ requires the Highways Agency approval.
- ★ will be expensive to implement and enforce.
- ★ is not cost-effective and is not likely to be implemented.

6.2.3 Crawler lanes (Option 3)

OBJECTIVES

To reduce nitrogen dioxide emissions from road traffic through the provision of a designated lane for slow moving vehicles. May need to operate only during peak hours.

SCENARIO

- ★ Slow moving vehicles can use a designated lane (crawler lane) on the motorway.

RESPONSIBLE ORGANISATION

The Highways Agency will be responsible for the implementation of this option.

NON AIR QUALITY IMPACTS

- ★ May reduce congestion on the other motorway lanes.
- ★ May increase noise at residential properties near to the motorway.

PERCEPTIONS

This option may be viewed as a good idea as it frees the other lanes of slow moving vehicles for the faster vehicles to use.

EFFECTIVENESS

This option may free up the other two lanes from slow moving traffic and improve traffic flow.

It should not require additional enforcement as other vehicles can use this lane if it is clear of slow moving vehicles.

However, it would bring the slower moving Heavy Duty Vehicles closer to residential properties. HDV produce proportionately higher levels of pollution than LDV, so NO₂ concentrations may rise. The section of the M3 between Junction 4 & 4a is relatively flat which means HDVs could be moving at the maximum speed allowed.

COST AND FEASIBILITY

The cost involved should be relatively low as it is likely to only involve some roadside signs and signs painted on the road.

The installation of a crawler lane between the two junctions, although feasible, is unlikely to provide any improvement to the NO₂ concentrations. It may even cause the concentrations to rise. The cost involved in creating the crawler lane could be more beneficially spent on other projects that would improve the air quality.

Although it is feasible to implement this option, it is not likely to provide any benefit in improving air quality.

SUMMARY

Option 3:

- ★ is possible to implement and relatively low cost.
- ★ is not likely to reduce NO₂ concentrations but could increase them.
- ★ requires Highways Agency approval.
- ★ is not likely to be implemented.

6.2.4 Motorway tolls (Option 4)

OBJECTIVE

To reduce nitrogen dioxide emissions from road traffic through the provision of implementing a road toll. The money obtained from the motorway toll can be used to cover the costs of implementing this option and then subsidise other options that would reduce NO₂ concentrations.

SCENARIO

- ★ The toll obtained can be used to finance this option and other options.
- ★ The toll may reduce the amount of traffic using this section of the M3 motorway.

RESPONSIBLE ORGANISATION

The Highways Agency will be responsible for the implementation and maintenance of this option.

NON AIR QUALITY IMPACTS

- ★ May increase traffic congestion in tollbooth area.
- ★ May increase noise levels in tollbooth area.
- ★ May increase traffic levels on other roads in the borough causing congestion and additional noise as the drivers avoid the toll.

PERCEPTIONS

May be disliked by motorists as they pay their vehicle excise duty (car tax), which currently pays for road use.

EFFECTIVENESS

A barrier gate method would be expensive to install and maintain, would cause congestion at the tollbooth and cause increased NO₂ and noise levels as vehicles accelerate away.

A number plate identification scheme which note drivers using the motorway section between junction 4 & 4a, and bills drivers afterwards, would be expensive

to install, maintain, operate and enforce. This type of toll system, however, would not cause congestion or an increase in noise levels.

With effective signage prior to the tolled section, it may reduce the amount of traffic using the motorway thus reducing the NO₂ concentrations.

COST AND FEASIBILITY

The revenue obtained can be used to pay for this scheme and then, once paid off, subsidise other pollution reducing options with any surplus revenue in future years.

It is difficult to gauge the changes a toll scheme may have on the traffic flows and thus the improvement in NO₂ concentrations.

The initial cost of implementing this option will be high and has to be approved by the Highway Agency. This option is feasible especially as the costs can be recovered through the toll revenue. However, this scheme will only slightly reduce NO₂ concentrations through reduced traffic levels, would take several years to implement and several more years thereafter before enough revenue is available to subsidise other options that reduce NO₂ levels more effectively. This option is not likely to be implemented.

SUMMARY

Option 4:

- ★ Barrier tolls would create congestion of the motorway, increase noise levels and would be costly to install and maintain.
- ★ A number plate identification scheme would be costly to install, maintain, operate and enforce but would not cause congestion or increase traffic noise.
- ★ Revenue from the tolls would pay for the implementation of this option and surpluses could subsidise other options, but this would be after many years.
- ★ Unlikely to directly reduce NO₂ levels with any significance.
- ★ Not likely to be implemented due to high initial costs and minimal reduction in NO₂ concentrations.

6.2.5 IMPROVE ROAD SIGNAGE (OPTION 5)

OBJECTIVES

To reduce nitrogen dioxide emissions from road vehicles through improved signage reducing traffic flow.

SCENARIO

- ★ Improved road junction signage, where required, would ensure drivers exit at the correct junction and not travel through the AQMA section of the M3 unnecessarily to exit at the next junction.

RESPONSIBLE ORGANISATION

The Highways Agency would be responsible for the implementation of this action.

NON AIR QUALITY ISSUES

- ★ Not designed to re-route traffic off the M3 onto Hampshire County Council Highway Authority controlled roads.
- ★ May reduce the potential for accidents caused by drivers making late decisions to turn off the M3.

PERCEPTIONS

May be viewed as useful by drivers.

EFFECTIVENESS

It is not known how effective this option may be as the current road signs may be sufficient. However, any reduction in NO₂ concentrations from this option would be low.

COST AND FEASIBILITY

This option may require the installation or replacement of a few road signs. The cost of this option would be low.

This option is feasible and its implementation will be decided upon by the Highways Agency following a survey of the current road signs and their effectiveness.

SUMMARY

Option 5:

- ★ is feasible and at relatively low cost.
- ★ requires Highways Agency approval.
- ★ may be implemented by the Highways Agency following a survey into the effectiveness of existing road signs on the M3.
- ★ requires joint working with Hampshire County Council (Highways Authority).

6.2.6 Enforce driving on the left (Highway code rule 238)

OBJECTIVE

To reduce NO₂ concentrations from road traffic using the M3 by easing congestion and improving free-flowing traffic through getting drivers to use the left-hand lane of the M3 when not overtaking.

SCENARIO

- ★ Get drivers to drive on the left when they are not overtaking.
- ★ This will improve the free-flow of traffic on the M3.

RESPONSIBLE ORGANISATIONS

The Highways Agency can educate and inform drivers.

The Police working with the Highways Agency can enforce the Highway Code.

NON AIR QUALITY ISSUES

- ★ Highway code -

"Lane discipline

238: You should drive in the left-hand lane if the road ahead is clear. If you are overtaking a number of slower moving vehicles it may be safer to remain in the centre or outer lanes until the manoeuvre is completed rather than continually changing lanes. Return to the left-hand lane once you have overtaken all the vehicles or if you are delaying traffic behind you. Slow moving or speed restricted vehicles should always remain in the left-hand lane of the carriageway unless overtaking. You **MUST NOT** drive on the hard shoulder except in an emergency or if directed to do so by signs."

- ★ Ease congestion on motorway.
- ★ May encourage drivers to drive on the left on other roads (dual-carriageways).
- ★ May cause a small increase in noise levels at receptor points, as more vehicles will be using the left-hand lane than at present.

PERCEPTIONS

Drivers currently think the left-hand lane is for slower heavy duty vehicles and not cars so they remain in the centre lanes even when the left-hand lane is clear.

Drivers will notice fewer 'lane-blockers which cause annoyance and stress to those following behind.

Residents in properties neighbouring the M3 may think traffic flow levels have increased, as the vehicles will be travelling closer to them.

EFFECTIVENESS

With improved free-flowing traffic, NO₂ concentrations will fall. This will be by a low amount as traffic speeds may increase as a result.

COST AND FEASIBILITY

This option should incur low costs. There may be a need to install some additional signage at the roadside. There will be costs involved in advertising this issue as part of educating drivers through various media.

Reducing congestion will have an economic benefit as vehicles arrive earlier incurring fewer running costs.

Normal Police and Highways Agency patrols (if active on this section of M3) should be sufficient to enforce this option thus incurring no extra cost.

This option is feasible to implement at low cost. Highways Agency will decide on its implementation.

SUMMARY

Option 6:

- ★ will improve the free-flow of road traffic by enforcing lane discipline.
- ★ reduces congestion
- ★ improves economic benefits through reduced running times.
- ★ is possible to implement at low cost.

6.2.7 Tree planting (Option 7)

OBJECTIVE

To reduce NO₂ concentrations through the planting of trees along the side of M3.

SCENARIO

- ★ Plant trees and plants that fixate nitrogen from the atmosphere along the side of the M3.

RESPONSIBLE ORGANISATION

The Highways Agency will be responsible for implementing and maintaining this option.

NON AIR QUALITY ISSUES

- ★ Improves the aesthetics of the motorway.
- ★ May reduce/mask noise from the vehicles using the M3 to nearby residents.
- ★ To be effective an area of more than 30 metres either side of the motorway between junctions 4 & 4a is required. This may not be available without compulsory land purchases.

PERCEPTIONS

People assume trees help to reduce pollution and seeing them in place is a visible sign that something is being done to reduce pollution and noise.

EFFECTIVENESS

Various scientific researches indicate that trees can remove NO₂ (and PM₁₀) from the air, providing they are enough of them. However, it has been very difficult to quantify how much NO₂ is removed by each possible type of tree.

COST AND FEASIBILITY

It is unlikely that there is enough width at the side of this section of the M3 to plant enough trees/shrubs to reduce NO₂ concentrations. Therefore, the need to purchase additional land would be required. This may not be possible physically or financially.

The number of trees required would be substantial. Therefore, the cost of purchase, planting and maintaining could fall into the medium category.

This option is not likely to be implemented as it does not guarantee to reduce NO₂ concentrations and the land required for it to be effective is not available.

SUMMARY

Option 7:

- ★ may reduce NO₂ concentrations, if there are a sufficient number of trees.
- ★ may provide aesthetic benefits and mask road traffic noise.
- ★ is not likely to occur as land is not available for effective planting.
- ★ would be in the medium cost range for the number of trees required, without any land purchase.
- ★ not likely to be implemented as it would not be cost effective.

6.2.8 Overview of Direct actions

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
1	Speed regulation & enforcement	HA HPC	60 mph – 2.0 μgm^{-3} 50 mph – 3.1 μgm^{-3}	High	Variable – No Fixed – Yes
2	Multiple-occupancy lanes & enforcement	HA HPC	Low	High	No
3	Crawler lanes	HA	Low	Low	No
4	Motorway tolls	HA	Low	High	No
5	Improve road signage	HA	Low	Low	Yes
6	Enforce driving on the left	HA HPC	Low	Low	Yes
7	Tree planting	HA	Low	Medium	No

Key:

* - Low <0.2 μgm^{-3} ; Medium 0.2 – 1.5 μgm^{-3} ; High >1.5 μgm^{-3}

** - Low < £50000; Medium £50000 - £200000; High > £200000

HA – Highways Agency

HPC – Hampshire Police Constabulary

As can be seen, there are three possible options that it is feasible to implement, assuming the fixed sign option is adopted in option 1. These all depend on the agreement of the Highways Agency to these options.

7 POSSIBLE INDIRECT ACTIONS TO IMPROVE AIR QUALITY WITHIN THE AQMA

The air quality within the Air Quality Management Area is sourced mainly from road traffic emissions but also from background pollution concentrations as mentioned in Section 3.

Indirect actions will target reducing emissions from various sources that help to make up the background pollution levels in the AQMA. Outside the AQMA, the major source of pollution in the Borough of Rushmoor, is from road traffic with the addition of some industrial and domestic sources.

7.1 Indirect actions outside the AQMA

All of the measures considered that have indirect actions on air quality can be categorised into seven groups. These are labelled:

- ★ Education
- ★ Travel plans
- ★ Enforcement
- ★ Other road schemes
- ★ Planning
- ★ Do nothing
- ★ Air quality monitoring

These measures are **all likely to have a low effect on reducing the nitrogen dioxide levels in the AQMA**. The measures that are implemented should, however, help to improve the air quality around the Borough where they are active, even if it is only by a small amount.

Some of these measures may already be implemented, ongoing and need expanding upon.

7.1.1 Education

If we need people to change their habits, their way of life and raise their consciousness of air quality issues, we need to provide the information, the medium to get the information across to them and the incentives to change their lifestyles.

The method employed to get this message across must not be viewed as one that lectures or has a "...must do this, must do that..." attitude. If the audience feel these then they will ignore the message and not participate in it.

A lot of the options below, fall under the Travelwise umbrella (Option 10). However, these options when considered individually can provide their own benefits.

The options considered are:

- Option 6 - Enforce drive on the left (Highway code)**
- Option 8 - Encourage alternative transport modes**
- Option 9 - Alternative fuel schemes/fuel efficient vehicles**
- Option 10 - Travelwise**
- Option 11 - Increase air quality information dissemination**
- Option 12 - General health education**
- Option 13 - Better driving techniques**

7.1.1.1 Enforce driving on the left (Highway code) (Option 6)

This option was also considered in Section 6.2.6 as a direct action.

OBJECTIVE

To reduce NO₂ concentrations from road traffic using all dual-carriageway roads by easing congestion and improving free-flowing traffic through getting drivers to use the left-hand lane when not overtaking.

SCENARIO

- ★ Get drivers to drive on the left when they are not overtaking.
- ★ This will improve the free-flow of traffic on the roads.

RESPONSIBLE ORGANISATIONS

The Highways Agency, Hampshire County Council and Rushmoor can inform and educate drivers.

The Police can enforce the Highway Code.

NON AIR QUALITY IMPACTS

- ★ Ease congestion on the roads.
- ★ May encourage drivers to drive on the left on roads (dual-carriageways).
- ★ May cause a small increase in noise levels at receptor points, as more vehicles will be using the left-hand lane than at present.

PERCEPTIONS

Drivers currently think the left-hand lane is for slower heavy duty vehicles and not cars, so they remain in the centre lanes even when the left-hand lane is clear.

Drivers will notice fewer 'lane-blockers' who cause annoyance and stress to those following behind.

Residents in properties neighbouring the roads may think traffic flow levels have increased, as the vehicles will be travelling closer to them.

EFFECTIVENESS

For this option to work it must have an educational element. The public must be reminded about Highway Code rule 238 and the intention to enforce it.

The failure to adhere to this rule is a national problem, not just locally, so methods used in disseminating the message can be done on a national scale. The reasons for implementing this option must be clear e.g. to help reduce lane blocking thus aiding the free-flow of traffic and improving air quality.

The various methods that could be employed in getting this message across could include adverts in the newspapers, on the radio and television. Strategically placed roads signs can remind drivers to drive on the left, especially if they enter an area, such as an AQMA.

This option will have a low effect on reducing the nitrogen dioxide levels outside and inside the AQMA.

COST AND FEASIBILITY

In addition to Section 6.2.6 above, which mainly dealt with the enforcement of this option on the M3, the cost of implementing this option on the educational side depends on the medium and frequency used in disseminating the message. Costs could range from low to medium.

This option is feasible to implement, as the minimum costs would be low. The extent of educational awareness depends on the advertising medium used and funds available.

SUMMARY

In addition to Section 6.2.6, option 6:

★ will raise awareness of driving on the left for low to medium cost.

7.1.1.2 Encourage alternative transport modes (Option 8)

OBJECTIVES

To reduce nitrogen dioxide concentrations in the Borough by encouraging the public to use other transport methods instead of using their cars.

SCENARIO

- ★ Provide better information on the alternative transport modes available.

RESPONSIBLE ORGANISATION

The Highways Agency, Hampshire County Council, Rushmoor and transport companies (bus & rail) can all implement this option.

NON AIR QUALITY ISSUES

- ★ Fewer vehicles on the roads cause less congestion and noise.
- ★ Fitness levels of those who walk or cycle, instead of using their car, will improve.
- ★ Social interaction could improve amongst those who use communal transport (e.g. buses, trains).

PERCEPTION

A common thought is public transport runs late and is unreliable and like walking and cycling, takes too long and is tiresome, especially if carrying shopping etc.

The car is thought to be a comfort zone providing protection to its occupants from strangers. Cars allow the occupants to get to their destination more easily and quickly than by other measures.

EFFECTIVENESS

Rushmoor already implements this option in conjunction with Hampshire County Council. Bus lanes and cycle routes, which help speed the vehicles through heavily trafficked roads, have been designated around the borough. Both councils and the

bus companies are working closely together to identify other routes that would benefit from being designated special routes.

COST AND FEASIBILITY

Hampshire County Council's 'Local Transport Plan 2⁷' is aiming at a 12.5% increase in bus passengers within existing Quality Bus Partnerships (QBP); a 5% increase within new QBP and a 7.6% increase on other bus routes, all by 2011. Hampshire County Council is also aiming at a 6% rise in rail travellers by 2011.

The cost in providing bus and cycle lanes is high. Encouraging the public to switch to other transport modes can range from low to medium cost depending on the measures to be employed.

Advertising campaigns can be used to encourage the public to use other modes of transport than the car. The cost involved in this would be low.

This option can also be incorporated into work travels plans, which are considered in Section 7.1.2 below.

This option can incur high costs but is a continuation of existing projects. Therefore it is a feasible option.

SUMMARY

Option 8:

- ★ is already implemented by Rushmoor in partnership with Hampshire County Council.
- ★ needs to be advertised to encourage the public to use other transport modes than the car.
- ★ costs will be high but are part of a continuing project and is therefore feasible.

⁷ Local Transport Plan 2, Hampshire County Council, 2006

7.1.1.3 Alternative fuel schemes or fuel efficient vehicles (Option 9)

OBJECTIVE

To reduce pollution levels by encouraging owners to change the fuel used in their vehicle and to consider buying a more environmentally friendly vehicle when they purchase a new vehicle.

SCENARIO

- ★ Using alternative fuels in current vehicle.
- ★ Purchasing an environmentally friendly vehicle (e.g. hybrid).

RESPONSIBLE ORGANISATIONS

The Highways Agency, Hampshire County Council, and Rushmoor can encourage and inform the public on this option and work with local filling station owners to ensure alternative fuels supplies are available.

NON AIR QUALITY ISSUES

- ★ Costs involved in the fuel conversion of existing vehicles.
- ★ Slightly higher costs in purchasing new environmentally friendly vehicles (e.g. hybrids).
- ★ Limited supply of alternative fuel stations (e.g. LPG).
- ★ Alternative fuels are usually cheaper than standard fuels.

PERCEPTIONS

People feel alternative fuelled vehicles do not perform as well as conventional vehicles and that they are difficult to refuel. There is also the opinion that alternative fuels are dangerous e.g. compressed liquid gas tanks in the vehicle. Little is known about what alternative fuels are available.

EFFECTIVENESS

The use of alternative fuels will reduce the amount of pollutants currently being emitted to the atmosphere from road vehicles. However, there will have to be a

very large uptake of this option for any reasonable reduction in pollution concentrations, which is unlikely, so the nitrogen dioxide reduction would be low.

COST AND FEASIBILITY

For cars to be converted so they are able to use alternative fuels, for example Liquid Petroleum Gas (LPG) there will be costs of about £1500 per vehicle. The current cost of LPG is less than half the cost of petrol so the cost of conversion will soon be recovered. There are grants available for conversions from various sources.

There are limited LPG filling stations in the area so this may deter owners to converting their vehicles. However, if the demand is there then more filling stations might supply LPG.

The cost of purchasing new environmentally friendly vehicles e.g. LPG is higher than that for conventional vehicles. This will be offset over time, as fuels are cheaper than petrol. The Government currently offers incentives through cheaper vehicle excise duty (car tax) on more environmentally friendly vehicles.

There are a few choices in hybrid vehicles currently on the market and most conventional vehicles can be converted to take, for example LPG.

This option can also be incorporated into work travels plans, which is considered in Section 7.1.2 below.

This option is feasible at low cost but the benefit is also low.

SUMMARY

- ★ Costs involved in converting conventionally fuelled vehicles. Grants are available for this.
- ★ Alternative fuels are cheaper than petrol or diesel.
- ★ Increased number of hybrid vehicles available on the new vehicles market.
- ★ This option is feasible at low cost but provides low NO₂ benefits.

7.1.1.4 Travelwise (Option 10)

OBJECTIVES

To reduce society's dependence on car use by: raising awareness of environmental, health, economic and social effects of car use; changing attitudes towards car use; promoting more sustainable modes of travel, and lifestyles which require less travel; encouraging action to change travel behaviour and reduce unnecessary car use.

SCENARIO

- ★ To make the public more aware of environmental issues, how their actions and lifestyle effect the environment and what they can do to minimise those effects.

RESPONSIBLE ORGANISATIONS

Rushmoor, Hampshire County Council, working in partnership with transport companies and businesses are responsible for implementing this option.

NON AIR QUALITY ISSUES

- ★ Can improve the health and fitness of people who walk, run or cycle instead of using their car.
- ★ Can increase business for transport companies.
- ★ May reduce the amount of traffic on the roads.

PERCEPTIONS

Travelwise works behind the scenes and few people outside Travelwise are aware of its potential.

EFFECTIVENESS

Travelwise has an objective of many parts. Most of the measures taken under the Travelwise umbrella will have a low effect on pollution levels as they are aimed at raising the public awareness on their dependence on the car. The reduction in nitrogen dioxide levels in implementing this option would generally be low.

COST AND FEASIBILITY

The cost of implementing this option would be low. As Travelwise covers a wide number of measures that do not all have to be implemented for it to work.

Travelwise is a vehicle that disseminates information to its members and keeps them up-to-date about schemes and events that other members are doing in order to promote the objectives of the group. Travelwise provides experts in the following kind of initiatives and can help with:

- ★ School Travel Plans
- ★ Travel Plans for hospitals, workplaces and other sites
- ★ Effective and targeted sustainable transport campaigns, such as Walk to School Week and Bike Week
- ★ Encouraging walking, cycling, car sharing and public transport use through a variety of events, activities and programmes

This option is feasible as Rushmoor and Hampshire County Council are already members of Travelwise.

SUMMARY

- ★ Travelwise promotes and provides information on various initiatives that remove the public's dependence on the car.
- ★ Rushmoor and Hampshire County Council are already members of Travelwise.
- ★ This option is feasible to implement at low cost but will provide a small reduction in NO₂.

7.1.1.5 Increase air quality information dissemination (Option 11)

OBJECTIVE

To improve the amount of air quality information available to those who require it.

SCENARIO

- ★ Provide detailed and up-to-date air quality information on Rushmoor's website.

RESPONSIBLE ORGANISATION

Rushmoor is responsible for implementing this option.

NON AIR QUALITY ISSUES

- ★ From information supplied the public can make informed decisions about their lifestyle and how they effect the environment.
- ★ By providing information that is readily available on the website this will free up council officer's time to attend to other matters.

PERCEPTIONS

People feel there is not enough information available on air quality issues. Also, if there is limited access to air quality monitoring data the perception is that there is something to hide. This option will help to dispel this.

EFFECTIVENESS

This option will certainly improve the air quality information available to the public but it is thought it will have only a very small effect on reducing nitrogen dioxide concentrations within the borough as a whole and even less within the Air Quality Management Area.

COST AND FEASIBILITY

The cost of placing additional information on Rushmoor's website and maintaining it will be very small. Once established, the air quality webpages can be easily updated as part of council officer's normal work.

As the website is already in existence this option is feasible to implement in the action plan.

SUMMARY

Option 11:

- ★ will improve the amount of air quality information available to the public.
- ★ is likely to only have a negligible impact on reducing NO₂ concentrations within the AQMA and low costs.
- ★ is feasible as it will improve the council's air quality webpages, which are already in existence.

7.1.1.6 General health education (Option 12)

OBJECTIVES

To provide information to the public about the health effects of air pollutants.

SCENARIO

- ★ Providing access to those who are susceptible to respiratory ailments so they can make informed decisions about their lifestyle.

RESPONSIBLE ORGANISATION

The Blackwater Valley & Hart Primary Care Trust and Rushmoor can implement this option.

NON AIR QUALITY ISSUES

- ★ The quality of life of those who suffer from respiratory ailments can improve.
- ★ May reduce the amount of medical appointments due to better self-management of respiratory ailments.

PERCEPTIONS

People are not fully aware about how pollution can effect them or which pollutants cause them irritation. For instance, people are unaware that pollution levels inside the car they are travelling in could be much higher than if they were walking or cycling.

EFFECTIVENESS

This option is likely to have negligible effect on reducing the NO₂ concentration within the AQMA as there will only be a few people who suffer respiratory ailments using the M3 and who will change their travel habits.

COST AND FEASIBILITY

This option can be implemented through websites, leaflets and verbal communication. The costs involved would be low and this information is already available on various websites. This information can be drawn together and made more directly available through the PCT and Rushmoor's website.

This option is feasible at low cost as it is currently available. It will, however, have little effect on reducing NO₂ concentrations within the AQMA.

SUMMARY

- ★ People with respiratory ailments may not be fully aware of the health effects of pollutants and where they can be most concentrated.
- ★ Health information regarding air quality is already available but could be highlighted by the PCT and Rushmoor.
- ★ This option is feasible, although it will have negligible effects on reducing NO₂ levels within the AQMA.

7.1.1.7 Better driving techniques (Option 13)

OBJECTIVE

To reduce nitrogen dioxide concentrations by raising the awareness of better driving techniques for drivers.

SCENARIO

- ★ Better driving techniques will reduce NO₂ emissions from vehicles and also reduce motoring costs.

RESPONSIBLE ORGANISATION

The Highways Agency, Hampshire County Council and Rushmoor can all implement this option.

NON AIR QUALITY ISSUES

- ★ Better driving techniques will reduce motoring costs for drivers.
- ★ Less fuel use.
- ★ Less noise generated through vehicle use.
- ★ Fewer accidents on the road.

PERCEPTIONS

Drivers assume they drive well and do not like being told they could do better.

EFFECTIVENESS

Better driving techniques is something most drivers can benefit from and would reduce NO₂ emissions from their vehicles. This applies to drivers on the M3 as well as within the Borough of Rushmoor and would therefore reduce the NO₂ concentrations within the AQMA.

COST AND FEASIBILITY

The cost of implementing this option would be low to medium, depending on the advertising medium used to get the message across and how widespread the advertising goes.

This option is feasible as it is easy to implement at low to medium costs and would provide a low reduction in NO₂ concentrations.

SUMMARY

Option 13:

- ★ will advise how most drivers can improve their driving technique.
- ★ will reduce fuel use, noise and accidents.
- ★ will have costs that range from low to medium depending on the advertising medium used and low impact on improving air quality.
- ★ is feasible implement.

7.1.1.8 Overview of indirect actions - education

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
6	Enforce driving on the left	HA HPC	Low	Low	Yes
8	Use alternative transport modes	HA HCC RBC	Low	High	Yes
9	Alternative fuel/ greener vehicles	HA HCC RBC	Low	Low	Yes
10	Travelwise	RBC HCC	Low	Low	Yes
11	AQ information dissemination	RBC	Low	Low	Yes
12	Health information dissemination	PCT RBC	Low	Low	Yes
13	Better driving techniques	HA HCC RBC	Low	Low / Medium	Yes

Key:* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

HA – Highways Agency

HCC – Hampshire County Council

RBC – Rushmoor Borough Council

All of the educational options above could feasibly be implemented or are in part already implemented.

7.1.2 Travel plans

Some of the main reasons why people travel in their cars are to get to and from work or school. They use the most convenient method of transport and may not be aware of the alternatives. They may need an incentive to change their method of travel and this could be provided through various travel plans.

Travel plans would have to be tailor-made to suit the business or school who would operate them. Travelwise (as mentioned in Section 7.1.1.4) is able to provide advice and steerage on the development of travel plans through the assistance of Rushmoor and Hampshire County Council.

There are three options in this section that look at travel plans and those options are:

Option 14 - Work travel plans

Option 15 - Safe routes to school

Option 16 - Rushmoor Borough Council travel plan

7.1.2.1 Work travel plans (Option 14)

OBJECTIVE

To reduce nitrogen dioxide emissions from road traffic by encouraging local businesses to develop and adopt work travel plans.

SCENARIO

- ★ Businesses adopting a travel plan that encourages various methods of travel to and from work that reduces the dependence on their cars.

RESPONSIBLE ORGANISATION

Hampshire County Council, Rushmoor and local businesses working together.

NON AIR QUALITY ISSUES

- ★ Travel costs may change for staff.
- ★ Incentives could be offered to entice staff to adopt the work travel plan and compensate them for any inconvenience caused.
- ★ Businesses could include the travel plan into employment contracts.
- ★ Businesses may have to reorganise their schedules to accommodate travel plan measures e.g. flexi-time, variable delivery times.

PERCEPTIONS

Businesses may think travel plans are not suitable for them to adopt. There may be a loss of business due to the changes brought about by the travel plan or costs of implementing it would be prohibitive. Their staff may not be receptive to a travel plan.

EFFECTIVENESS

The effect a work travel plan may have on reducing nitrogen dioxide concentrations, or other pollutants, is difficult to gauge as it depends on the location, size and nature of the business, the current modes of transport and routes used by the staff and business and the measures that make up the travel plan.

In Rushmoor, out of all the people who work around three-quarters work in Farnborough (Rushmoor First Annual Monitoring Report 2004 to 2005). There are 26500 people who commute into the borough and 26200 people who live and work in Rushmoor. This makes a total of 105400 commuting journeys a day.

From a survey conducted on Council employees in 2003, 79% travelled to work alone in their cars. If this is a reflection of other businesses within the borough then work travel plans could have some impact on reducing the amount of vehicles used to get to and from work.

As individual businesses, the effect on NO₂ concentrations in the AQMA and the Borough will be negligible. However, the accumulative effect of several businesses may have a low effect on reducing NO₂ concentration levels.

COST AND FEASIBILITY

The cost of developing and implementing a travel plan depends on the measures contained within it. Some measures do not need to involve a lot of changes that incur financial input e.g. getting staff to sign a pledge that they will use other means of getting to work than by their car. Other measures may cost the business some money e.g. subsidising or paying for a staff bus.

Rushmoor and Hampshire County Council are already helping some local businesses to implement travel plans so this option is feasible as a continuation of this partnership. The cost of implementing this option is likely to be low for most businesses.

SUMMARY

- ★ Over 105000 commuting journeys a day to and from places of work in Rushmoor.
- ★ This option will have a low impact at reducing NO₂ concentrations within the AQMA and incur low costs.
- ★ This option is feasible as travel plans are already being implemented with advice from Rushmoor and Hampshire County Council.

7.1.2.2 Safe routes to school (Option 15)

OBJECTIVES

To reduce nitrogen dioxide concentrations by reducing the number of car journeys to and from schools.

SCENARIO

- ★ Schoolchildren are provided with safe routes to school other than by car.

RESPONSIBLE ORGANISATION

Rushmoor and Hampshire County Council working with individual schools.

NON AIR QUALITY ISSUES

- ★ The safety of the schoolchildren to and from school is improved.
- ★ Social interaction between parents, schoolchildren and their peers will improve.
- ★ Schoolchildren are likely to become fitter and more attentive in class.
- ★ There will be fewer cars arriving at the school gates and as a result, less car-generated noise for nearby residents and less congestion on the roads.

PERCEPTIONS

This option would make parents feel happier about their children's safety.

EFFECTIVENESS

This option would have only a marginal effect on reducing NO₂ concentrations within the AQMA. Although there are some schools near to it, there are none inside the AQMA. The amount of cars that would be withdrawn from the 'school-run' would be small in comparison to the total number of vehicles travelling within the AQMA each day.

COST AND FEASIBILITY

Rushmoor and Hampshire County Council are already working with schools to create safe routes to school.

This option would just be a continuation of this so it is a feasible option to implement in the action plan.

SUMMARY

- ★ Safe routes to school are already being implemented.
- ★ This option will have a negligible effect on NO₂ concentrations within the AQMA.
- ★ This option is feasible to implement as part of the air quality action plan.

7.1.2.3 Rushmoor Borough Council travel plan (Option 16)

OBJECTIVE

To reduce nitrogen dioxide levels within the borough by measures contained in a work travel plan.

SCENARIO

- ★ Encourage staff to travel to and from work and in the operation of their duties during work by other means than by car.

RESPONSIBLE ORGANISATION

Rushmoor is responsible for this option.

NON AIR QUALITY ISSUES

- ★ Fitness levels may rise amongst staff.
- ★ Consideration for different methods of working.

PERCEPTION

Rushmoor needs a travel plan as it encourages other businesses and organisations to have travel plans and must be seen to lead by example.

EFFECTIVENESS

There are about 350 members of staff in the council of which 93% travel to work by car. (Travel plan questionnaire, 2004)⁸. 36% of staff requires their car to carry out their duties while 21% carry out other errands requiring their car such as dropping children off to school.

The travel plan will encourage the rest to use other means to travel to work such as cycling, car sharing or homeworking, but this number will be small in comparison to the total number of cars on the road in the borough. This means although there will be a positive effect on reducing NO₂ concentrations these will have a negligible effect in the AQMA.

⁸ Rushmoor Travel questionnaire, 2004, Rushmoor Borough Council website

COST AND FEASIBILITY

Rushmoor Cabinet (08 February 2005) approved the introduction of the council travel plan as well as £10000 to purchase a pool car

This option is feasible especially as it is currently being implemented.

SUMMARY

Option 16:

- ★ is already implemented as Rushmoor has a current travel plan.
- ★ will have negligible impact at reducing NO₂ concentrations.
- ★ is feasible as it is already implemented.

7.1.2.4 Overview of indirect actions – travel plans

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
14	Work travel plans	RBC HCC Local business	Low	Low	Yes
15	Safe routes to school	RBC HCC Local schools	Low	Low	Yes
16	Rushmoor travel plan	RBC	Low	Low	Yes

Key:

* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

HCC – Hampshire County Council

RBC – Rushmoor Borough Council

All of the travel plan options above are feasible to implement as part of the Air Quality Action Plan because they are already implemented. However, there is scope to expand on the number of businesses and schools that have travel plans.

7.1.3 Enforcement

There is enforcement legislation available to control pollution emitted from industrial and domestic sources. These are:

Option 17 - Environmental Protection Act 1990 & Pollution Prevention Control Act 1999 – (Part A2/B installations)

Option 18 - Clean Air Act 1993 – (Industrial smoke control)

Option 19 - Environmental Protection Act 1990 – (Statutory nuisance)

Rushmoor already uses these enforcement powers to control emissions from industrial and domestic sources.

7.1.3.1 Environmental Protection Act 1990 & Pollution Prevention Control Act 1999 – (Part A2/B installations) (Option 17)

OBJECTIVES

To control emissions from industrial installations through a regulatory process under the Environmental Protection Act 1990 (EPA90) & Pollution Prevention Control Act 1999 (PPC99).

SCENARIO

- ★ Industrial installations that emit to the atmosphere and fall within the provisions of the EPA90 & PPC99 will be issued with a permit and regularly inspected to ensure compliance.

RESPONSIBLE ORGANISATION

Industrial installations are split into three regulatory categories: Part A, Part A2 and Part B. Part A installations are inspected by the Environment Agency while Part A2 and Part B installations are inspected by local authorities.

In Rushmoor, there are no Part A or Part A2 installations. Rushmoor currently Permits, and carries out inspections on, 23 Part B installations within the borough.

NON AIR QUALITY ISSUES

- ★ Industrial installations can emit noise, which may be deemed a nuisance.
- ★ There may be high volumes of Heavy Duty Vehicles to and from the site.
- ★ Industrial installations can be unsightly.

PERCEPTIONS

People who live close to industrial installations dislike them because of the noise, traffic and emissions they generate.

EFFECTIVENESS

The conditions of the permit will minimise the amount of emissions to the atmosphere from the installation. There are no installations in or near the Air Quality Management Area (AQMA) in Rushmoor so these controls will have a low impact on reducing nitrogen dioxide (NO₂) emissions within the AQMA.

COST AND FEASIBILITY

Under the EPA90 & PPC99 regime permitted installations are risk assessed and this determines the amount of inspections that are carried out each year on the installation. The Department of Environment, Food and Rural Affairs (defra) indicate each year the subsistence fees each installation should pay to the regulating local authority to cover the cost involved in undertaking these inspections.

Therefore, these inspections will fall into the low cost category as there should be no cost to the responsible organisation in implementing this option.

This option is feasible as it is already being implemented within Rushmoor.

SUMMARY

- ★ EPA90 & PPC99 legislation is already being used to control industrial emissions to air.
- ★ The legislation ensures that costs incurred in regulating these installations are covered by the installation.
- ★ This option is feasible as it is already being implemented.

7.1.3.2 Clean Air Act 1993 – (Industrial smoke control) (Option 18)

OBJECTIVE

To control emissions to the atmosphere from those industrial processes and trade premises that fall outside the scope of the EPA90 using the powers under the Clean Air Act 1993.

SCENARIO

- ★ Controlling small industrial processes and others who may emit black smoke to the atmosphere.

RESPONSIBLE ORGANISATION

Rushmoor is responsible for implementing this option.

NON AIR QUALITY ISSUES

- ★ Control of chimney heights of certain installations.
- ★ Require notification of installations of industrial furnaces.

PERCEPTIONS

Industrial processes that create visual emissions are considered bad polluters.

EFFECTIVENESS

In controlling black smoke emissions Rushmoor will be reducing the amount of pollutants emitted to the atmosphere. There are currently no such situations of black smoke from industrial, trade or domestic chimneys in Rushmoor as this legislation is already being implemented. So the reduction in NO₂ concentrations, especially in the AQMA, will be low.

COST AND FEASIBILITY

The cost of implementing this option is borne from current budgets. There have been very few incidents over recent years where the council has had to investigate and take action against black smoke emissions from chimneys so the cost for this is low.

This option is feasible as it is currently part of the normal working of council officers.

SUMMARY

- ★ The Clean Air Act 1993 provides legislation to control black smoke emissions from chimneys.
- ★ This option is feasible as Rushmoor already enforce this legislation.

7.1.3.3 Environment Protection Act 1990 – (Statutory nuisance) (Option19)

OBJECTIVE

To control emissions of noise, smoke, fumes, gases, dust, steam and odours to the atmosphere from premises that may be deemed a statutory nuisance under the EPA90.

SCENARIO

- ★ Controlling emissions from bonfires or other combustion sources from domestic and industrial premises.

RESPONSIBLE ORGANISATION

Rushmoor will implement this option.

NON AIR QUALITY ISSUES

- ★ Noise emissions from industrial and domestic premises are also controlled under this legislation.

PERCEPTIONS

People have the right to not be effected by emissions from other premises that interfere with their normal life. Everybody has a duty of care not to cause a nuisance to others under the EPA90.

EFFECTIVENESS

Rushmoor already applies this legislation as part of its normal operation. Bonfires are allowed within Rushmoor but they must not cause a smoke or odour nuisance. Bonfires can produce fine particles (PM₁₀), other pollutants such as dioxins and smoke especially if plastics, rubber or damp garden waste is burnt.

Rushmoor promotes alternative methods of disposing of garden waste than bonfires such as home composting by offering discounts on garden composters; providing a garden waste collection service or taking the waste to nearby amenity sites where it will be recycled.

The Environment Agency regulates the disposal of trade waste which should be disposed of appropriately, not by burning it.

All these measures already exist and reduce the need for bonfires. As a result they have reduced the amount of NO₂ added to the background concentration. They will have a negligible impact on reducing NO₂ concentrations within the AQMA.

COST AND FEASIBILITY

This option is already implemented through normal working operations of the council and from existing budgets.

Therefore, this option is feasible to implement.

SUMMARY

- ★ Statutory nuisance legislation under the EPA90 is being enforced as part of the council's normal operation.
- ★ Control of bonfires and the encouragement of garden waste disposal through other means are already implemented.
- ★ This option is feasible.

7.1.3.4 Overview of indirect actions - Enforcement

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
17	EPA90 & PPC99 – (Part A2/B installations)	RBC	Low	Low	Yes
18	Clean Air Act 1993 – (Industrial smoke control)	RBC	Low	Low	Yes
19	EPA90 – (Statutory nuisance)	RBC	Low	Low	Yes

Key:

* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

RBC – Rushmoor Borough Council

Rushmoor already enforces these Acts to maintain control on emissions to the atmosphere so they are all feasible to implement as part of the Air Quality Action Plan.

7.1.4 Other road schemes

Traffic is the main source of pollution, not just within the AQMA but the borough as a whole. The direct measures mentioned in Section 6 of this Air Quality Action Plan looked at measures that effect the traffic within the AQMA.

These next few sub-sections look at other measures that could be employed outside the AQMA that have an indirect effect on the air quality inside the AQMA and in the borough.

The options considered are:

- Option 20 - Improve east/west routes through Farnborough**
- Option 21 - Reduce junction congestion**
- Option 22 - Co-ordinate roadworks**
- Option 23 - Adjust speed limits on county roads**

7.1.4.1 Improve east/west routes through Farnborough (Option 20)

OBJECTIVES

To reduce nitrogen dioxide levels in the AQMA by improving east/west routes through Farnborough.

SCENARIO

- ★ To allow traffic travelling from east to west or visa versa more easily through Farnborough without using the M3.

RESPONSIBLE ORGANISATION

Hampshire County Council would implement this option.

NON AIR QUALITY ISSUES

- ★ This option would increase traffic flows within Farnborough and possibly cause congestion where there currently is none.
- ★ This option would increase noise to residents living on the east/west route.
- ★ This option would reduce the safety of pedestrians and road users due to an increase in traffic.
- ★ The existing road network in Farnborough may not be suitable for this option.

PERCEPTIONS

People feel there is too much traffic on the roads in Farnborough already. This option would have negative environmental impacts .

EFFECTIVENESS

This option would have a negligible reduction on NO₂ concentrations within the AQMA. It is likely to increase pollution levels in other parts of Farnborough causing an exceedance of air quality objective levels where currently there is no pollution issue. Therefore this option is not effective.

COST AND FEASIBILITY

This option will have high cost implications as roads may have to be restructured to accommodate it. Hampshire County Council and Rushmoor would not support this option due to the negative environmental impacts it offers.

Therefore this option is not feasible.

SUMMARY

Option 20:

- ★ may find the current east/west routes through Farnborough are not suitable for this option.
- ★ will increase congestion on Farnborough roads.
- ★ will reduce road safety on Farnborough roads.
- ★ will increase pollution levels on the roads in Farnborough.
- ★ is not feasible as Hampshire County Council and Rushmoor will not support it on cost and environmental grounds.

7.1.4.2 Reduce junction congestion (Option 21)

OBJECTIVE

To reduce nitrogen dioxide concentrations within the Air Quality Management Area by regulating traffic flow more efficiently through M3 Junctions 4 & 4a.

SCENARIO

- ★ Install peak-time traffic signals at the junction to control traffic flow more efficiently.

RESPONSIBLE ORGANISATION

The Highways Agency, Hampshire County Council and Surrey County Council will have to implement this option.

NON AIR QUALITY ISSUES

- ★ Future employment growth e.g. Hartland Park Redevelopment (in Hart District Council) could lead to increased traffic volumes on the local road network.

PERCEPTIONS

Drivers held at the junction by traffic lights may feel they are being delayed. The public in areas surrounding the exit roads from the junctions may feel the traffic has got worse as it will travel through in concentrated 'packets'.

EFFECTIVENESS

During peak-hours there is congestion at these junctions as traffic tries to exit them from the motorway. This option would help to reduce the congestion and have a positive effect on reducing NO₂ concentration within the AQMA. However, the peak-hours traffic using the junctions only account for a small amount of the volume of traffic using the M3 during the day so the impact on the NO₂ concentration will be low.

COST AND FEASIBILITY

A full and extensive traffic survey will have to be undertaken to ascertain the true extent of the congestion at the junction so that the exact measures required can be determined. If full signalization of Junction 4 and 4a is required this option will have high costs. There will be delays caused during the works required to install a scheme, which will cause some economic costs.

When considering the costs involved and the low reduction in NO₂ concentration achieved this option is not cost effective and therefore not feasible.

SUMMARY

Option 21:

- ★ can control peak-hour congestion at the M3 junctions through the installation of traffic signals.
- ★ requires an extensive traffic monitoring survey to determine what measure is most effective.
- ★ will only have a small reduction on the NO₂ concentrations in the AQMA.
- ★ will be expensive to implement.
- ★ is not feasible as it is not cost-effective.

7.1.4.3 Co-ordinate roadworks (Option 22)

OBJECTIVE

To reduce nitrogen dioxide concentrations in the borough by getting utility services and the local Highway Authority to co-ordinate roadworks at the same time to minimise congestion on the roads.

SCENARIO

- ★ If the Highway Authority plans to resurface a road they can communicate with the local utility services to see if they plan to undertake works on the road so they can be done before resurfacing.
- ★ Two or more utility services need to work on the same road in the same area then they arrange to do it at the same time.

RESPONSIBLE ORGANISATION

The Hampshire County Council (Highway Authority) in correspondence with the utility services are responsible for implementing this option.

NON AIR QUALITY ISSUES

- ★ Drivers are not caused prolonged and unnecessary delays due to multiple roadworks.
- ★ Noise is not continuous for local residents from prolonged roadworks.
- ★ Newly resurfaced roads do not instantly become a patchwork of repairs.

PERCEPTIONS

People always seem to think that newly resurfaced roads are dug up within weeks of it being laid.

Multiple roadworks at different times give the impression of never ending roadworks.

EFFECTIVENESS

Continued roadworks cause congestion. If routine works can all be arranged to take place at the same time this will reduce traffic congestion and as a result, NO₂

concentrations. This will have a low impact on NO₂ background levels and a smaller effect within the AQMA.

COST AND FEASIBILITY

It will be difficult to get all the utilities arranging their works to take place at the same time, but with enough advanced warning it should be possible to achieve. The cost of this option should be low as it only requires sufficient advanced warning and communication between the responsible organisations. This option would work if there was one central organisation, such as the Highway Authority, to co-ordinate.

This option is feasible at low cost but will only have a low impact on NO₂ concentrations, especially within the AQMA.

SUMMARY

Option 22:

- ★ needs all utilities to give advanced warning of roadworks to the Highways Authority so they can arrange those in the same road for the same time.
- ★ will reduce congestion and have a low reduction in NO₂ concentrations.
- ★ is feasible at low cost.

7.1.4.4 Adjust speed limits on county roads (Option 23)

OBJECTIVE

To reduce nitrogen dioxide concentrations by adjusting the speed limits on county roads and improve traffic flow.

SCENARIO

- ★ Reducing the speed limit from 30 mph to 20 mph to improve traffic flow and safety.

RESPONSIBLE ORGANISATION

Hampshire County Council is responsible for implementing this option.

NON AIR QUALITY ISSUES

- ★ Safety will be improved as the traffic will be moving more slowly.
- ★ May need to be enforced by installing speed reducing methods e.g. speed humps, cameras, chicanes etc.

PERCEPTIONS

Residents, depending on the speed restriction methods used, may view reduced speeds a good idea and as annoying to drivers. Speed humps are considered to cause additional noise and pollution.

Increased speeds are considered more likeable by drivers but more dangerous by residents.

EFFECTIVENESS

Improving the traffic flow will reduce pollution emissions. However, this will only be by a small amount and will have a low impact on the NO₂ concentrations within the AQMA. Current traffic speeds on urban roads are limited by road conditions so most speed limits are currently suitable for those conditions.

COST AND FEASIBILITY

If speed restriction methods are required such as speed humps, cameras, chicanes etc the cost of implementing this option could be high depending on the measures employed.

As most roads in Rushmoor are currently controlled effectively and the air quality benefits from this option are low, this option is not feasible as it is not cost effective.

SUMMARY

Option 23:

- ★ requires adjusting speed limits on county roads in the borough to improve traffic flow.
- ★ is likely to only improve NO₂ concentrations slightly with little effect within the AQMA.
- ★ does not require implementing as speed limits on the roads in the borough are already controlled and the cost of installing speed reducing measures would be high.
- ★ is not feasible to implement.

7.1.4.5 Overview of indirect actions – Other road schemes

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
20	Improve east/west routes through Farnborough	HCC	Low	High	No
21	Reduce junction congestion	HA HCC SCC	Low	High	No
22	Co-ordinate roadworks	HCC Utility Co	Low	Low	Yes
23	Adjust speed limits on county roads	HCC	Low	High	No

Key:

* - Low <0.2 μgm^{-3} ; Medium 0.2 – 1.5 μgm^{-3} ; High >1.5 μgm^{-3}

** - Low < £50000; Medium £50000 - £200000; High > £200000

HCC – Hampshire County Council

HA – Highways Agency

Only Option 22 is feasible to implement as part of the air quality action plan. The others are not cost-effective to implement.

7.1.5 Planning

Planning can have an important influence on air quality by ensuring all planning applications are considered with their effect on air quality and how it is likely to effect nearby sensitive receptors such as residences, hospitals, schools etc.

When planning applications are submitted to the Rushmoor Planning Team consultation takes place with the Environmental Health team.

An Environmental Statement, as part of an Environmental Impact Assessment, usually accompanies most applications for large developments and Environmental Health is consulted on these.

There are two options involving planning that can be included in the air quality action plan. There are:

Option 24 - Local Development Framework

Option 25 - Section 106 agreements

7.1.5.1 Local Development Framework (Option 24)

OBJECTIVE

To reduce NO₂ pollution levels within the AQMA, and pollution levels in the whole borough, through air quality assessment of planning applications received.

SCENARIO

- ★ A planning application received for a large residential development should be assessed for possible pollution effects on existing sensitive receptors.

RESPONSIBLE ORGANISATION

Rushmoor is the organisation that will implement this option.

NON AIR QUALITY ISSUES

- ★ Planning applications are assessed for noise issues arising out of the new development.
- ★ Planning applications are assessed for traffic generation arising out of the new development.

PERCEPTIONS

Residents frequently object to planning applications if they think they will cause noise or air pollution that may affect them.

EFFECTIVENESS

Large developments could have a noticeable adverse effect on air quality in the immediate area of the development. As the traffic disperses away from the development the effect on air quality becomes less so the likely effects on NO₂ concentrations within the AQMA will be low.

COST AND FEASIBILITY

The Planning Team already consults with Environmental Health on applications received. The Local Development Plan is currently under construction and it will incorporate Planning Policy Statement 23: Planning and Pollution⁹ and Rushmoor Local Plan¹⁰ which already cover air quality issue regarding planning. Implementing this option into the action plan will not incur any additional cost.

This option is feasible as it is currently implemented.

SUMMARY

- ★ Planning applications are currently being assessed for their impact on air quality.
- ★ Rushmoor's Local Development Plan is currently being constructed.
- ★ This plan is feasible to implement.

⁹ Planning Policy Statement 23, Office of Deputy Prime Minister, 2004

¹⁰ Local Plan, Rushmoor Borough Council, 2000

7.1.5.2 Section 106 agreements (Option 25)

OBJECTIVES

To reduce NO₂ concentrations within the AQMA by agreeing, where appropriate, Section 106 agreements with developers of new planning applications.

SCENARIO

- ★ A large development that has the potential to emit high levels of pollution (e.g. includes an industrial process) agrees to install pollution mitigation measures and air quality monitoring equipment under Section 106.

RESPONSIBLE ORGANISATION

Rushmoor's Planning Team and Environmental Health Team will implement this option.

NON AIR QUALITY ISSUES

- ★ Section 106 agreements can be used for other issues, including noise control, to benefit the area local to the development.

PERCEPTIONS

People assume developers may not consider the effect of large developments on the local area they are being built in.

EFFECTIVENESS

The effect of Section 106 agreements, in this scenario, is to control the emissions from the development. Therefore, a Section 106 agreement will have an effect ranging from low to high on controlling pollution emissions depending upon the type of development.

COST AND FEASIBILITY

The cost involved in Section 106 agreements is borne by the developer. The costs involved could range from low to high depending on the type of development and what is required under the Section 106 agreement.

The Section 106 agreement to control pollution emissions would be agreed upon including the costs involved, so this option is feasible.

SUMMARY

- ★ Developers will agree with the Planning team on a Section 106 agreement to control pollution emitted from their development.
- ★ This option is feasible.

7.1.5.3 Overview of indirect actions – Planning

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
24	Local Development Plan	RBC	Low	High	Yes
25	Section 106 agreements	RBC	Low/High	Low/High	Yes

Key:

* - Low $<0.2 \mu\text{g m}^{-3}$; Medium $0.2 - 1.5 \mu\text{g m}^{-3}$; High $>1.5 \mu\text{g m}^{-3}$

** - Low $< \text{£}50000$; Medium $\text{£}50000 - \text{£}200000$; High $> \text{£}200000$

RBC – Rushmoor Borough Council

Both of these above option are feasible. Option 24, although being compiled, is in current use through existing planning policies and PPS23. Option 25 is in current use.

7.1.6 Do nothing

This is one option that has been considered for implementing as part of the Air Quality Action Plan. Nationally, air quality is improving including nitrogen dioxide concentrations, which are falling.

The nitrogen dioxide concentrations within the AQMA are just below the annual Air Quality Objective level, so this 'Do nothing' approach seems attractive as no effort and no costs would be involved.

Option 26 - Do nothing

7.1.6.1 Do nothing (Option 26)

OBJECTIVE

To reduce NO₂ concentrations within the AQMA by taking no action to effect the levels.

SCENARIO

- ★ Do nothing and let national air quality improvement initiatives take their course.

RESPONSIBLE ORGANISATION

Rushmoor would implement this option.

NON AIR QUALITY ISSUES

- ★ Adverse weather patterns can cause increases in NO₂ concentrations and therefore worsen the situation.

PERCEPTIONS

People and other environmental organisations may assume Rushmoor does not care about air quality, the environment and the public's health.

EFFECTIVENESS

Depending on the weather conditions, if favourable there may be a low to medium reduction in NO₂ concentrations. Adverse weather conditions could have the opposite effect.

COST AND FEASIBILITY

This option would not incur any financial cost and as such looks an attractive option. However, the Local Air Quality Management Policy Guidance, LAQM.PG(03), Section 3.02, states '*An Air Quality Action Plan must include the following: ...How the local authority will use its powers and also work in conjunction with other organisations in **pursuit** of the air quality objectives.*'

As a result of the Policy Guidance, this option is not feasible.

SUMMARY

- ★ The 'Do nothing' approach will not incur any costs.
- ★ National NO₂ concentration reduction measures will bring levels to meet the required target.
- ★ LAQM,PG(03) does not allow this option so it is not feasible

7.1.6.2 Overview of indirect actions – Do nothing

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
26	Do nothing	RBC	Low/medium	Low	No

Key:

* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

RBC – Rushmoor Borough Council

This option is not feasible due to Policy Guidance given that local authorities must pursue the Air Quality Objectives.

7.1.7 Air quality monitoring

Rushmoor currently has an extensive monitoring survey within the AQMA. The monitoring is undertaken using two methods: continuous and passive.

The continuous monitoring methods assess nitrogen oxides and PM₁₀ Particulates. The analysers are located in Medway Drive, Farnborough and are within the AQMA. They are expensive to purchase and to maintain.

The analysers provide 15-minutes average data that is regularly downloaded by an office-based computer where the information is stored. Data is also obtained from a weather station at this monitoring site.

The analysers are subjected to Quality Assurance/Quality Control standards similar to that set by defra for all their air quality Automatic Urban and Rural Network monitoring sites in Britain. The data is ratified at the end of each calendar year.

Passive nitrogen dioxide diffusion tubes are located at strategic locations within the AQMA. These tubes provide a monthly average of NO₂ concentrations and together give a good indication of the NO₂ levels across the AQMA. Diffusion tubes are a cheap method of monitoring and as such are used in strategic locations to provide data from across the Borough.

Option 27 – Air quality monitoring

7.1.7.1 Air quality monitoring (Option 27)

OBJECTIVE

To continue to monitor air pollution at strategic locations across the Borough.

SCENARIO

- ★ To monitor NO₂ levels across the borough to detect any exceedance of the relevant air quality objective.

RESPONSIBLE ORGANISATION

Rushmoor is responsible implementing this option.

NON AIR QUALITY ISSUES

- ★ Need suitable and representative monitoring locations.

PERCEPTIONS

People feel confident if monitoring is being done.

EFFECTIVENESS

Monitoring air quality will not reduce or increase pollution levels. The results of the monitoring can be used to target actions that do reduce pollution concentrations.

COST AND FEASIBILITY

Rushmoor does undertake air quality monitoring as mentioned in Section 7.1.7 above. The cost for this is sustained from normal budgets and in total falls within the low category unless new continuous analysers are required, in which case it could be medium.

This option is feasible as it is currently implemented as normal council work.

SUMMARY

Option 27:

- ★ is currently implemented with monitoring is being done in the AQMA and across the Borough.
- ★ is feasible.

7.1.7.2 Overview of indirect actions - Air quality monitoring

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
27	Air quality monitoring	RBC	Low	Low	Yes

Key:

* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

RBC – Rushmoor Borough Council

This option is feasible as it is currently implemented as part of normal council work.

8 COMMUNITY STRATEGY FOR RUSHMOOR

Rushmoor has developed a Community Strategy for Rushmoor 2004-2016¹¹. The strategy sets out strategic aims for the Rushmoor Strategic Partnership from which we can identify the priorities of the community and prepare action plans to address them.

The Community Strategy is a living document that provides the direction for improving the social, economic and environmental well being of the Borough. Its aim is to focus on major issues that effect the Borough, which when addressed, makes a real difference to Rushmoor.

The Rushmoor Strategic Partnership is a non-statutory, non-executive organisation working within the boundaries of Rushmoor. Its aim is to allow partners drawn from the public, private, community and voluntary sectors to work together to ensure that their plans are coherent and consistent. The Strategic Partnership will build upon and compliment existing work already being done in the Borough by local organisations.

The Community Strategy vision is “To make Rushmoor a place to live, work and visit which:

- ★ ... has an environment which is clean and cared for ...
- ★ ... enables citizens to lead healthy, active and fulfilling lives ...
- ★ ... provides transport options that are available for all ...”

These are three are the air quality relevant vision statements out of a total of eight.

The strategic aims relevant to this air quality action plan include:

- ★ “... To promote healthy lifestyles and ensure the services and facilities are in place to support them ...
- ★ ... To introduce measures to address congestion and safety issues on the Borough’s roads ...

¹¹ Community Strategy, Rushmoor Borough Council, 2005

- ★ ... To work with transport providers and users to secure transport options which are safe, affordable, accessible and integrated to meet the needs of the Borough ...
- ★ ... To monitor levels of pollution in the Borough and to introduce measures to reduce all forms of pollution ...
- ★ ... To ensure that the Partnership plays its part in raising awareness of, and contributes to addressing, wider issues that effect the Borough.”

In delivering the Community Strategy the Partnership will “... agree actions plans and start work ...” on delivering them by deciding where it can have the greatest impact.

The Air Quality Action Plan measure involving the Community strategy is:

Option 28 – Community Strategy.

8.1 Community Strategy (Option 28)

OBJECTIVE

To use the Rushmoor Strategic Partnership through the Community Strategy to help promote and implement various feasible measures contained in this action plan.

SCENARIO

- ★ To assist in raising air quality awareness and getting businesses to implement travel plans.

RESPONSIBLE ORGANISATION

Rushmoor including Rushmoor Strategic Partnership will implement this option.

NON AIR QUALITY ISSUES

- ★ Can assist in policy issues and bringing various organisations together.

PERCEPTIONS

A partnership can save time by ensuring duplication of work does not occur. More people are involved in the work which means less time is taken in preparing for its implementation.

EFFECTIVENESS

It is difficult to categorise the effectiveness of this option as it can cover so many of the other action plan options. It is likely, because most of the options in this action plan have an indirect effect on the nitrogen dioxide concentrations within the AQMA, that this option will also have a low impact on the NO₂ concentrations in the AQMA.

COST & FEASIBILITY

The cost of this option is likely to be low as the Community Strategy is already in existence. As a living document it should be able to adapt itself to include the relevant options of this action plan.

This option is feasible as the Community Strategy is currently implemented.

SUMMARY

- ★ The Community Strategy is a current living document.
- ★ The Community Strategy covers many areas the measures in this action plan.
- ★ The Rushmoor Strategic Partnership is an effective vehicle to help implement options in this action plan.
- ★ This option is feasible.

8.2 Overview of Community Strategy for Rushmoor

Option No.	Action	Responsible Organisation	Effect on Air Quality*	Cost**	Feasibility
28	Community Strategy for Rushmoor	RBC RSP	Low	Low	Yes

Key:

* - Low <0.2 µgm⁻³; Medium 0.2 – 1.5 µgm⁻³; High >1.5 µgm⁻³

** - Low < £50000; Medium £50000 - £200000; High > £200000

RBC – Rushmoor Borough Council

RSP – Rushmoor Strategic Partnership

This option is feasible as it is currently implemented as part of normal council work.

9 OPTION FUNDING

A lot of the twenty feasible options involve measures that are currently implemented as part of the normal work of the responsible organisation(s). This means that the option is likely to require no, or very little, additional funding.

Those options that are likely to incur high costs will have to apply for additional funding from future budgets. This will involve a comprehensive study surrounding the requirements of the option and calculation of the costs involved in implementing it.

Delays will be inevitable in securing the funds and this will influence the timescale in the implementation of these options.

10 GLOSSARY OF TERMS AND REFERENCES

10.1 Glossary of terms

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
bgd	Background
FR&A	Further Review & Assessment
HA	Highways Agency
HCC	Hampshire County Council
HDV	Heavy Duty Vehicles
kph	Kilometres per hour
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles
mph	Miles per hour
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
RBC	Rushmoor Borough Council
µgm ⁻³	Microgrammes per cubic metre

10.2 References

1. Air quality (England) Regulations, DETR, 2000
2. Air quality (England)(Amendments) Regulations, defra, 2002
3. Environment Act 1995, HMSO, 1995
4. Updating & Screening Assessment, Rushmoor Borough Council, 2006
5. Policy Guidance, LAQM.PG(03), defra, 2003
6. Further Review & Assessment, Rushmoor Borough Council, 2005
7. Local Transport Plan 2, Hampshire County Council, 2006
8. Travel Plan Questionnaire, Rushmoor Borough Council, 2004
9. Planning Policy Statement 23, Office of the Deputy Prime Minister, 2004
10. Local Plan, Rushmoor Borough Council, 2000
11. Community Strategy, Rushmoor Borough Council, 2005

APPENDIX A

**Air quality action plans matrix
– All options considered –**

Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
1	Speed regulation & enforcement	HA, HPC	Smooth traffic flow. Reduced emissions	Reduced background concentration	Highways Agency to implement	60 mph - High 50 mph - High	3	Noise levels may reduce	Traffic may use other routes through Farnborough	High	1	Fixed - Yes Variable - No	3
2	Multiple-occupancy lanes & enforcement	HA, HPC	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	Highways Agency to implement	Low	1	Faster journey times	May cause congestion in outer lanes	High	1	No	
3	Crawler lanes	HA	Smooth traffic flow. Reduced emissions	Reduced background concentration	Highways Agency to implement	Low	1	Faster journey times	HDV closer to residences. Lane switching at junctions.	Low	3	No	
4	Motorway tolls	HA	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	Highways Agency to implement	Low	1	Revenue will pay for toll. Surplus from other actions.	Congestion if barriers used. Increases traffic on other roads.	High	1	No	
5	Improve road signage	HA	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	Highways Agency to implement	Low	1	May reduce noise from M3	Negative environmental impacts	Low	3	Yes	3
6	Enforce drive on the left	HA, HPC, HCC	Smooth traffic flow. Reduced emissions	Smooth traffic flow. Reduced emissions	Highways Agency & Police to implement	Low	1	Reduce tailgating and potential accidents	Lane changing without warning by bad drivers	Low	3	Yes	3
7	Tree planting	HA	Negligible reduction in NO ₂	Aesthetic improvement	Highways Agency to implement	Low	1	Wind in leaves mask traffic noise	Require more than 30 m width at side of motorway	Medium	2	No	

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Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
8	Encourage alternative transport modes	HA, RBC, HCC, Transport Co	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	<u>LTP2:</u> Bus: +12.5% QBP, +7.6% new QBP, +7.6% other Rail: +6% All by 2011	Low	1	Social inclusion and interaction especially in walking, bus travel		High	1	Yes	1
9	Alternative fuel schemes/Fuel efficient vehicles	HA, RBC, HCC, Filling stations	Reduce NO ₂ emissions	Reduce NO ₂ emissions	Ongoing work	Low	1	Reduced petroleum demand	Catch 22' - car vs. fuel. Conversion costs. New Hybrid vehicles cost more.	Low	3	Yes	3
10	Travelwise	RBC, HCC	Reduce NO ₂ emissions	Reduce NO ₂ emissions	Ongoing work	Low	1	Raises pollution awareness		Low	3	Yes	3
11	Increase air quality information dissemination	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	End 2006	Low	1	Raises air quality awareness. May improve health	Little importance given to air quality issues.	Low	3	Yes	3
12	General health education	PCT	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	PCT to implement	Low	1	May reduce medical appointments		Low	3	Yes	3
13	Better driving techniques	HA, RBC, HCC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Save fuel and vehicle wear	Drivers do not like being told what to do.	Low	3	Yes	3
14	Work travel plans	HCC, RBC, Local businesses	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Reduce vehicles on road. May improve peoples fitness	Businesses may not want the expense.	Low	3	Yes	3
15	Safe routes to school	HCC, RBC, Local schools	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Social inclusion and interaction. Increased child safety.		Low	3	Yes	3

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Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ⁻³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
16	Rushmoor Borough Council travel plan	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Reduce vehicles on road. May improve peoples fitness	Tax payers money used that could be spent elsewhere.	Low	3	Yes	3
17	EPA90 & PPC99	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3
18	Clean Air Act 1993 industrial smoke control	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3
19	EPA90 statutory nuisance	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3
20	Improve east/west routes through Farnborough	HCC	May reduce NO ₂ emissions	May increase pollution levels in Borough	HCC to implement	Low	1		Increase traffic flows and noise in Borough. Reduce pedestrian safety.	Low	3	No	
21	Reduce junction congestion	HCC, SCC, HA	Reduce NO ₂ emissions	May increase pollution levels in Borough	HCC & SCC to implement	Low	1	Reduce traffic and economic costs	Future employment growth in area may increase traffic flows	High	1	No	
22	Co-ordinate roadworks	HCC, Utility Co	May reduce NO ₂ emissions	May increase pollution levels in Borough	HCC to implement	Low	1	Reduces queuing traffic throughout year.	Unforeseeable circumstances by one utility may hold up others.	Low	3	Yes	3
23	Adjust speed limits on county roads	HCC	May reduce NO ₂ emissions	May increase pollution levels in Borough	HCC to implement	Low	1	Improved pedestrian safety.	Increased noise from traffic calming measures	High	1	No	

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Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
24	Local Development Plan	RBC	Can control emissions from new developments in AQMA	Can control emissions from new developments	Ongoing work	Low	1	Noise and traffic generation controlled in new developments	Many small developments may have cumulative effect.	Low/High	1	Yes	1
25	Section 106 agreements	RBC	Can control emissions from new developments in AQMA	Can control emissions from new developments	Ongoing work	Low	1	Noise and traffic generation controlled in new developments	Many small developments may have cumulative effect.	Low/High	1	Yes	1
26	Do nothing	RBC	National initiatives will reduce NO ₂ levels in AQMA	National initiatives will reduce NO ₂ levels	Ongoing work	Low/Medium	2		Adverse weather conditions could cause increase in pollution	Low	3	No	
27	Air quality monitoring	RBC	None but can help target other options	None but can help target other options	Ongoing work	Low	1	None	None	Low	3	Yes	3
28	Community Strategy for Rushmoor	RBC RSP	None but can help target other options	None but can help target other options	Ongoing work	Low	1	Can avoid work duplication	None	Low	3	Yes	3

Key:	Index score	AQ improve	Cost	HA -	Highways Agency
	High	3	1	HPC -	Hampshire Police Constabulary
	Low	1	3	HCC -	Hampshire County Council
	Medium	2	2	RBC -	Rushmoor Borough Council
				PCT -	Blackwater Valley & Hart Primary Care Trust
				RSP -	Rushmoor Strategic Partnership

Appendix B

Air quality action plans matrix – Feasible options –

Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
1	Speed regulation & enforcement	HA, HPC	Smooth traffic flow. Reduced emissions	Reduced background concentration	Highways Agency to implement	60 mph - High 50 mph - High	3	Noise levels may reduce	Traffic may use other routes through Farnborough	High	1	Fixed - Yes Variable - No	3
5	Improve road signage	HA	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	Highways Agency to implement	Low	1	May reduce noise from M3	Negative environmental impacts	Low	3	Yes	3
6	Enforce drive on the left	HA, HPC, HCC	Smooth traffic flow. Reduced emissions	Smooth traffic flow. Reduced emissions	Highways Agency & Police to implement	Low	1	Reduce tailgating and potential accidents	Lane changing without warning by bad drivers	Low	3	Yes	3
8	Encourage alternative transport modes	HA, RBC, HCC, Transport Co	Reduced traffic volume. Reduced NO ₂	Reduced background concentration	LTP2: Bus: +12.5% QBP, +7.6% new QBP, +7.6% other Rail: +6% All by 2011	Low	1	Social inclusion and interaction especially in walking, bus travel		High	1	Yes	1
9	Alternative fuel schemes/Fuel efficient vehicles	HA, RBC, HCC, Filling stations	Reduce NO ₂ emissions	Reduce NO ₂ emissions	Ongoing work	Low	1	Reduced petroleum demand	Catch 22' - car vs. fuel. Conversion costs. New Hybrid vehicles cost more.	Low	3	Yes	3
10	Travelwise	RBC, HCC	Reduce NO ₂ emissions	Reduce NO ₂ emissions	Ongoing work	Low	1	Raises pollution awareness		Low	3	Yes	3

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Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
11	Increase air quality information dissemination	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	End 2006	Low	1	Raises air quality awareness. May improve health	Little importance given to air quality issues.	Low	3	Yes	3
12	General health education	PCT	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	PCT to implement	Low	1	May reduce medical appointments		Low	3	Yes	3
13	Better driving techniques	HA, RBC, HCC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Save fuel and vehicle wear	Drivers do not like being told what to do.	Low	3	Yes	3
14	Work travel plans	HCC, RBC, Local businesses	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Reduce vehicles on road. May improve peoples fitness	Businesses may not want the expense.	Low	3	Yes	3
15	Safe routes to school	HCC, RBC, Local schools	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Social inclusion and interaction. Increased child safety.		Low	3	Yes	3
16	Rushmoor Borough Council travel plan	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	Reduce vehicles on road. May improve peoples fitness	Tax payer's money used that could be spent elsewhere.	Low	3	Yes	3
17	EPA90 & PPC99	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3
18	Clean Air Act 1993 industrial smoke control	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3

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Option	Action	Responsible organisation	Positive effects on AQMA	Positive effects on Borough	Date to be achieved / targets	Effects on air quality: Low <0.2 µgm ⁻³ Medium 0.2 – 1.5 High >1.5	AQ index score	Other positive effects	Negative effects	Cost: Low <£50k Medium £50k - £200k High >£200k	Cost index score	Feasibility	Rank
19	EPA90 statutory nuisance	RBC	May reduce NO ₂ emissions	May reduce NO ₂ concentrations	Ongoing work	Low	1	May reduce other pollutants		Low	3	Yes	3
22	Co-ordinate roadworks	HCC, Utility Co	May reduce NO ₂ emissions	May increase pollution levels in Borough	HCC to implement	Low	1	Reduces queuing traffic throughout year.	Unforeseeable circumstances by one utility may hold up others.	Low	3	Yes	3
24	Local Development Plan	RBC	Can control emissions from new developments in AQMA	Can control emissions from new developments	Ongoing work	Low	1	Noise and traffic generation controlled in new developments	Many small developments may have cumulative effect.	Low/High	1	Yes	1
25	Section 106 agreements	RBC	Can control emissions from new developments in AQMA	Can control emissions from new developments	Ongoing work	Low	1	Noise and traffic generation controlled in new developments	Many small developments may have cumulative effect.	Low/High	1	Yes	1
27	Air quality monitoring	RBC	None but can help target other options	None but can help target other options	Ongoing work	Low	1	None	None	Low	3	Yes	3
28	Community Strategy for Rushmoor	RBC, RSP	None but can help target other options	None but can help target other options	Ongoing work	Low	1	Can avoid work duplication	None	Low	3	Yes	3

Key:	Index score	AQ improve	Cost	HA -	Highways Agency	RBC -	Rushmoor Borough Council
	High	3	1	HPC -	Hampshire Police Constabulary	PCT -	Blackwater Valley & Hart Primary Care Trust
	Low	1	3	HCC -	Hampshire County Council	RSP -	Rushmoor Strategic Partnership
	Medium	2	2				