WEST OXFORDSHIRE
DISTRICT COUNCIL

Air Quality
Action Plan

Horsefair and High Street, Chipping Norton

Community Services **October 2008**

Contents

1.0 Introduction

1.1 On 1st March 2005 West Oxfordshire District Council (The Council) declared two Air Quality Management Areas (AQMAs) in Witney and Chipping Norton because after detailed investigation it was concluded these areas would fail the Government's objective for the nitrogen dioxide annual mean concentration.

1.2 The duty of the Council was to produce an Action Plan with measures to reduce nitrogen dioxide air pollution to support the Government in meeting its National Air Quality Strategy commitments.

1.3 A wide range of measures were therefore developed by West Oxfordshire District Council and Oxfordshire County Council and these were put forward in the document "Draft Air Quality Action Plan - Horsefair and High Street Chipping Norton". The Plan went out to full public consultation between January and March 2008. The Executive Summary and the full draft can be viewed online at http://www.westoxon.gov.uk/environment/Draftactionplan.cfm . At the same time, the transport management options were appraised and modelled for their predicted air quality benefits and the results of this study became available at the beginning of the consultation process. The full report is provided in Appendix 3.

1.4 The result of the consultation process, together with the air quality modelling study have been used to develop this final Action Plan which sets out what will be done to reduce nitrogen dioxide air pollution. This report considers the outcome of the consultation process and sets out the rationale behind the final proposals for the action plan looking at their costs and benefits and providing a timetable for implementation. It does not repeat the detailed consideration of all options considered in the draft action plan, although the statutory background, health effects and analysis of the sources of nitrogen dioxide are repeated in sections 2 and 3.

2.0 Chipping Norton AQMA – Statutory background and source apportionment.

2.1 The provisions of Part IV of the Environment Act 1995[1] establishes a national framework for air quality management, requiring all local authorities in England, Scotland and Wales to conduct local air quality reviews. Where the reviews indicate that objectives set out in the National Air Quality Strategy will not be met, the relevant authority is required to designate an Air Quality Management Area (AQMA).

2.2 Under Section 88(1) of the Environment Act 1995 ('the Act'), the Department for Environment, Food and Rural Affairs (Defra), the Scottish Executive and the Welsh Assembly Government has published Local Air Quality Management technical guidance LAQM.TG(03). Under section 88(2) of the Act, local authorities are required to have regard to this guidance. Section 82(1) of the Act requires local authorities to undertake reviews of the current air quality in their area and of the predicted air quality in future years and to assess them against standards and objectives prescribed in the Strategy and in 'The Air Quality (England) Regulations 2000 as amended. [2]

2.3 A detailed assessment into air quality concluded that nitrogen dioxide was likely to fail the Government's annual mean objective for nitrogen dioxide:

Objective:
40 μg/m^3 when expressed as annual mean, to be achieved by 31st December 2005.[2]

It was concluded that as there was no other significant source of nitrogen dioxide in the areas, traffic was the main source of this pollution.

2.4 Under S84(1) the Council had to undertake further assessment work to supplement the information the authority had in relation to air quality. The Regulations require that the further assessment information be reported within 12 months of the declaration (March 2006).

Whilst this work was being undertaken, a draft of an action plan was required within 18 months of the original declaration.

Under S86(3) of the Environment Act 1995, County Councils have a duty to put forward proposed actions which they themselves can implement to work towards meeting the air quality objectives in AQMAs. County Councils should therefore include these measures within the air quality section of the Local Transport Plan (LTP).

2.5 The Air Quality Management Area (AQMA) in Chipping Norton includes all of Horsefair and parts of High Street, West Street and London Road. The Chipping Norton AQMA is shown in Appendix 1. Whilst traffic is thought to be the main source of the NO_2 pollution, it is necessary to determine the extent to which the different types of vehicles are contributing to this pollution (source apportionment) so that the options considered in the action plan can be better assessed in terms of the impact they are likely to have on air quality.

2.6 Chipping Norton

Horsefair and High Street constitute the main route for traffic travelling along the A44 from East to West. It is a busy road, which is a main route for HGVs. The area is a combination of commercial and residential premises. There are 30 residential properties in Horsefair, a significant number of which fall within the predicted NO_2 contours exceeding the objective standard. There are 26 residential properties in High Street and further properties in West Street; a number of these are also predicted to fall within areas of exposure above the objective standards.

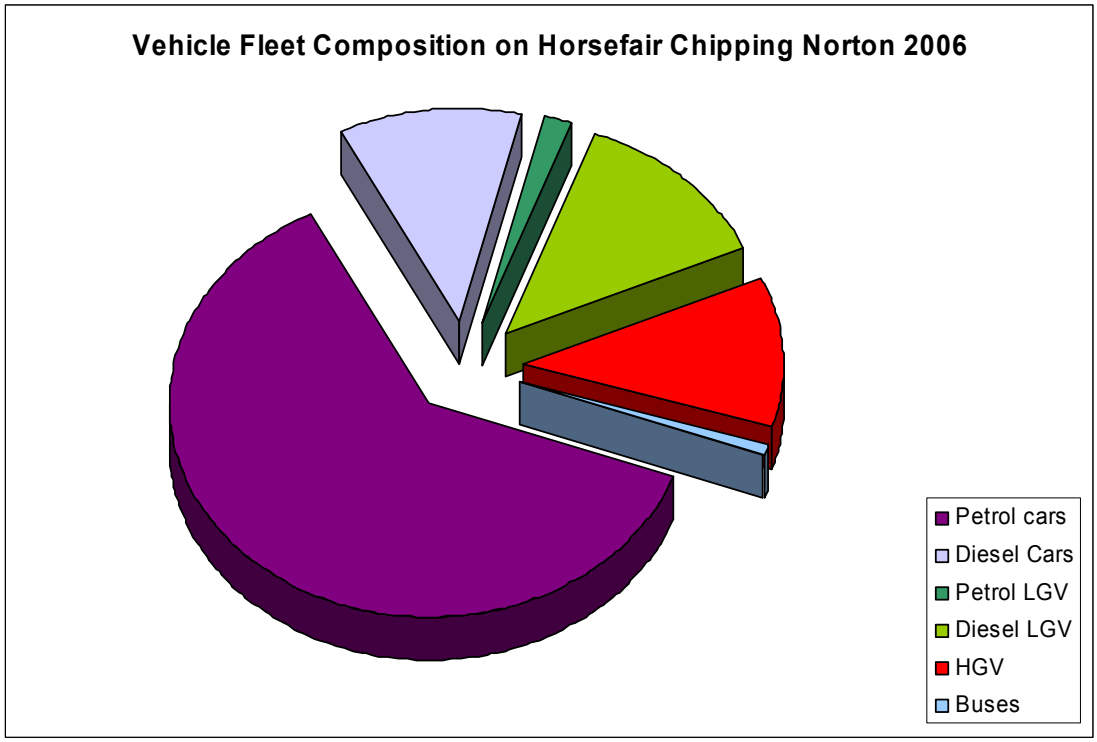
2.6 Details of the vehicle fleet composition utilising the Horsefair road network are presented in Table 1 and Chart 1 below.

Table 1

Vehicle Type	Petrol Cars	Diesel Cars	Petrol Light Goods Vehicles	Diesel Light Goods Vehicles	Buses	HGVs
Fleet composition as % of total	61.97	11.48	1.62	12.69	0.92	11.31

Data provided by Oxfordshire County Council – Sept 2006 Manual Count
Diesel cars and diesel LGV percentage calculated using NETCEN UK fleet composition projections v2 [3] and calculating from the ratio of petrol and diesel vehicles for 2006.

Chart 1



2.8 Despite petrol cars comprising the dominant category of road traffic passing through Horsefair proportionately they may not constitute the greatest source of NO_2. The different fuel, age and exhaust emission standards that apply to each vehicle type have to be factored into the calculation to appropriately delineate the contribution of each vehicle category to the NO_2 air pollution in the vicinity.

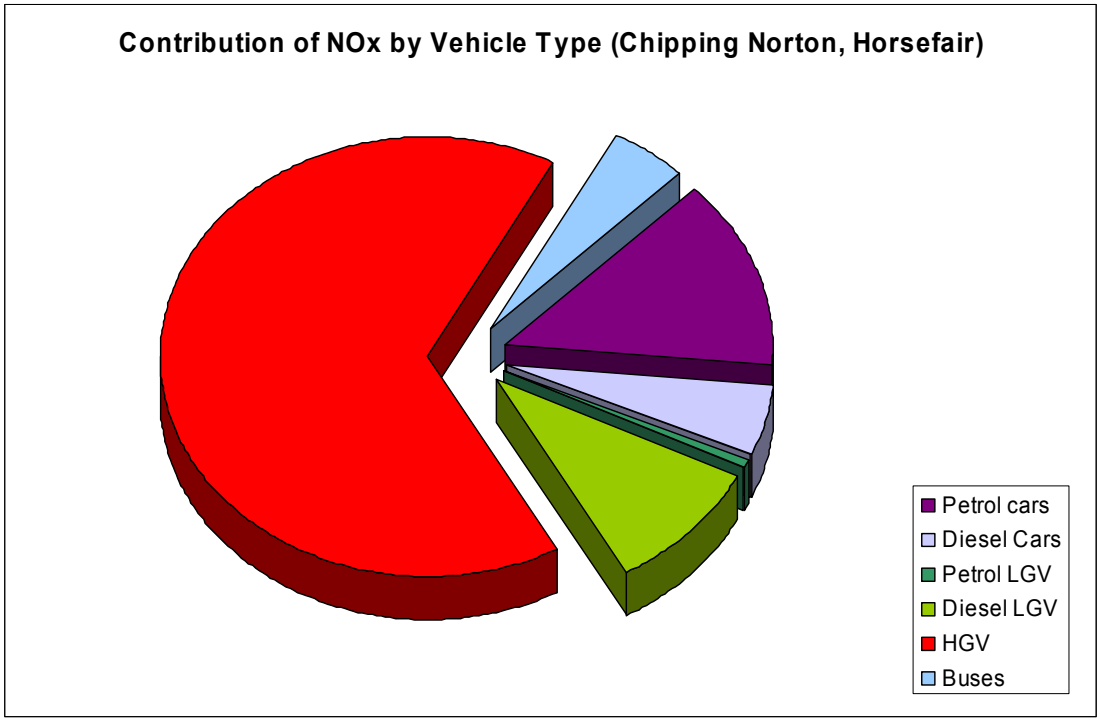
2.9 This contribution was calculated by integrating the traffic composition data with the Casella Stanger EFT Multiple v3a spreadsheet [4] . Calculation of NO_2 emissions within EFT is facilitated by consideration of the emissions factors for the year and vehicle type alongside the average vehicular speed, taken here to be 40km/h. The vehicle fleet composition data input into the spreadsheet was taken from the Oxfordshire County Manual Count Study of September 2006. The results are provided in Table 2 and Chart 2.

Table 2 % Contribution to NOx emissions of different vehicle types

Vehicle Type	Vehicle Count	NOx g/km	% Contribution to NOx Emissions
Petrol cars	9852	0.24	13.75
Diesel Cars	1825	0.51	5.52
Petrol LGV	258	0.29	0.43
Diesel LGV	2017	0.82	9.75
HGV	1798	6.2	65.70
Buses	146	5.6	4.84

Diesel cars and diesel LGV percentage calculated using NETCEN UK fleet composition projections v2 [3] and calculating from the ratio of petrol and diesel vehicles for 2006.

Chart 2 Contribution to NOx emissions of different vehicle types



2.10 Table 2 and Chart 2 emphasise the significantly elevated contribution per capita of HGVs in contrast to other road transport vehicles; as a consequence HGVs constitute the largest source of NO_2 emissions to Horsefair. Chart 2 also confirms that despite petrol cars constituting the largest vehicle fleet composition category, their relative contribution to NO_2 air pollution in Horsefair is far less than HGV counterparts.

2.11 Further assessment of air quality in 2006

Continuous chemiluminescent monitoring of nitrogen dioxide in Chipping Norton between March and October 2004 established the likelihood that the objective for nitrogen dioxide would not be met in the statutory timeframe. As part of the Stage 4 assessment, a chemiluminescent nitrogen dioxide monitoring station was positioned in High Street and since March 2006 has been collecting data from this location. Faber Maunsell, who originally carried out the Quality Assurance (QA) and modelling for the 2004 study, were commissioned to carry out the QA and to model the air quality data in support of the AQMA declaration. During 2006 Oxfordshire County Council organised a traffic count study to provide up to date vehicle fleet composition data which could be incorporated into the air quality study.

The conclusion of the further air quality assessment was to recommend no change to the defined AQMA.

2.12 Calculation of the % Reduction in NO_x Emissions Required within the AQMA

Table 7 of the Faber Maunsell Report (2007), presented in Appendix 4 of the Action Plan, details the relationship between NO_x and NO_2 measured in Chipping Norton. These were derived from continuous chemiluminscent monitoring in Chipping Norton in 2006. The figures presented in Table 7 facilitate the extrapolations of monitored NO_2 concentrations into NO_x concentrations. The following methodology allows calculation of the required reduction in NO_x emissions, in order to achieve the NO_2 Air Quality Objective.

1	Calculation of maximum acceptable contribution of NO_2 from Horsefair traffic:

A mean background concentration of nitrogen dioxide was calculated from NO_2 diffusion tube data captured at Withers Way and Coopers Close (Table 4 Faber Maunsell 2007). The air quality objective is 40µg/m^3, therefore the contribution from traffic sources must be no greater than 24µg/m^3.

NO_2 Source	**NO_2 µg/m^3**	**Data Source**
Background NO_2	16	(diffusion tube derivation)
Objective	40	(Air Quality Objective)
Required Contribution from traffic*	24	(Objective – Background)

*Contribution required to meet the Air Quality Objective, assuming traffic is the only source of NO_2 emissions to the air in Horsefair.

2	Calculation of NO_2 air quality objective exceedence on Horsefair:

The predicted concentration for nitrogen dioxide along Horsefair is between 40 µg/m^3 and 61 µg/m^3 (Table 8, Faber Maunsell 2007).

NO_2 Source	**NO_2 µg/m^3**	**Data Source**
Max Concentration (Horsefair)	61	(model prediction Faber Maunsell)
Objective	40	(Air Quality Objective)
Exceedence level	21	(Objective – Max Horsefair conc.)
Predicted contribution from traffic*	45	(Max Concentration – Background)

* Contribution, assuming traffic is the only source of NO_2 emissions to the air in Horsefair.

3	Contribution of Horsefair traffic to ambient NO_2 conc. and required abatement:

NO_2 Source	**NO_2 µg/m^3**	**NOx µg/m^3**
Reduction required on Horsefair	21	44.1*
Predicted contribution from traffic	45	94.5*
Required max traffic contribution.	24	50.4*

* At 61 µg/m^3 Chart 1of the Faber Maunsell report indicates a conversion factor of 2.1 from NO_2 to NO_X.

The actions to reduce NOx emissions will be targeted at traffic.

Therefore a 47% reduction of traffic NO_x emission is required from traffic sources in this area (44.1/94.5 x 100).

3.0 Nitrogen Dioxide and Air Pollution

3.1 Overview

The Government and the Devolved Administrations have adopted two Air Quality Objectives for nitrogen dioxide:

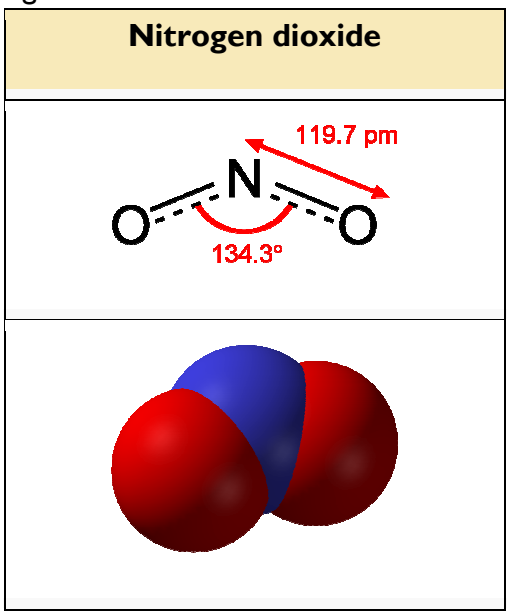
Objective:
40 µg/m^3 when expressed as annual mean, to be achieved by 31st December 2005.

200 µg/m^3 when expressed as a 1 hour average, not to be exceeded more than 18 times per year. To be achieved by 31st December 2005.

3.2 The First EU Air Quality Daughter Directive (1999/30/EC) also sets limit values for nitrogen dioxide, which have been transposed into UK legislation. The Directive includes a 1-hour limit value of 200 µg/m^3, not to be exceeded more than 18 times per year, and an annual mean limit value of 40 µg/m^3; both to be achieved by 1 January 2010.

What is nitrogen dioxide?

Figure 1



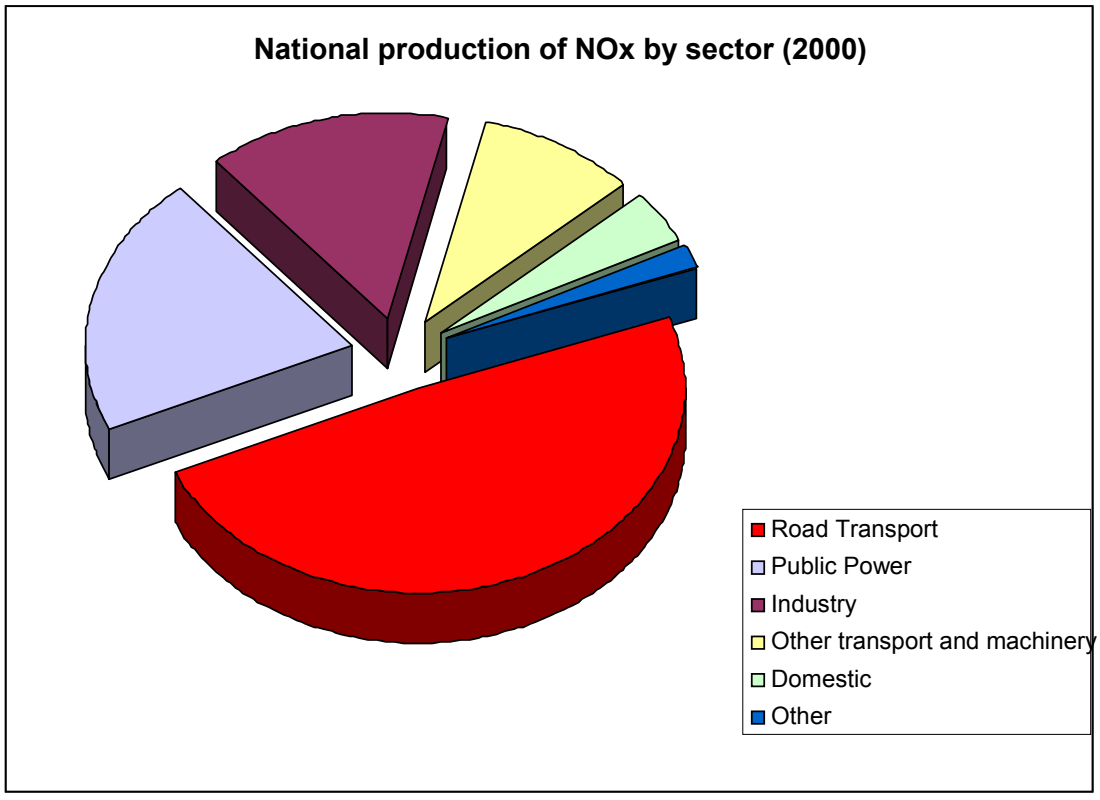
Wikipedia 2007[5]

3.3 Nitrogen dioxide is a brown gas, with the chemical formula NO_2. It is released into the atmosphere when fuels are burned (for example, petrol or diesel in a car engine or natural gas in a domestic central heating boiler or power station). NO_2 can affect our health. There is evidence that high levels of it can inflame the airways in our lungs although such levels have not been measured nor are expected in Witney and Chipping Norton. Sensitive receptors, such as people with asthma are particularly affected. Over a long period of time it can affect how well our lungs work. It can also adversely affect vegetation.

3.4 The National Perspective

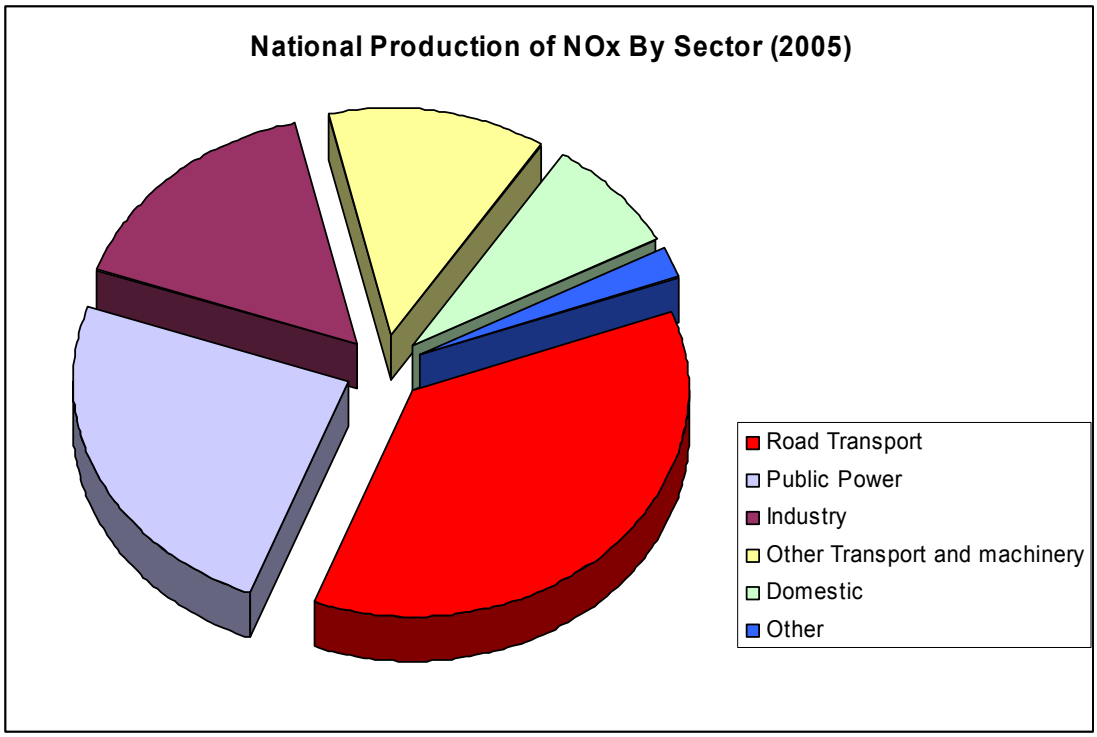
3.4.1 Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_X). All combustion processes produce NO_X emissions, largely in the form of nitric oxide, which is then converted to nitrogen dioxide, mainly as a result of reaction with ozone (O_3) in the atmosphere. It is nitrogen dioxide that is associated with adverse effects upon human health. However, because NO in the atmosphere is converted to NO_2, reductions in NOx emissions need to be made in order to reduce nitrogen dioxide concentrations in the air. Therefore in the Action Plan, improvements will be judged by reductions in NOx emissions.

3.4.2 The principal source of NOx emission is road transport, which accounted for about 49% of total UK emissions in 2000 [6]. Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Within most urban areas, the contribution of road transport to local emissions will be much greater than for the national picture. As an example, road transport is estimated to account for more than 75% of nitrogen oxides emissions in London.



NAEI 2007[7]

3.4.3 The contribution of road transport to nitrogen oxides emissions has declined significantly in recent years as a result of various policy measures, and further reductions are expected up until 2010 and beyond. For example, urban traffic nitrogen oxides emissions were estimated to fall by about 35% between 2000 and 2005, and by 46% between 2000 and 2010 (NAEI 2007)[7].



NAEI 2007[7]

3.4.4 Other significant sources of nitrogen oxides emissions include the electricity supply industry and other industrial and commercial sectors, which accounted for about 24% and 16% respectively in 2005 (NAEI 2007). Emissions from both sources have also declined, due to the fitting of low nitrogen oxides burners, and the increased use of natural gas plant. Industrial sources make only a very small contribution to annual mean nitrogen dioxide levels, although breaches of the hourly nitrogen dioxide objective may occur under rare, extreme meteorological conditions, due to emissions from these sources.

3.4.4 NO_2 has a number of environmental effects. It is damaging to ecosystems as it stunts growth and stresses plant life, making it more susceptible to other effects such as frost damage and disease. It is one of the gases that contribute to acid rain, affecting the natural balance of rivers, lakes and soils, causing damage to wildlife and vegetation and damaging buildings by gradually dissolving the stonework. It reacts with other pollutants to form ground-level ozone, which can damage plant life and materials such as rubber.

3.4.5 When nitrogen dioxide is present with sulphur dioxide, the combination of effects is greater than the sum of the individual effects of the two chemicals – a synergistic effect. This increases the damage to plant life.

3.5 Global environmental effects

3.5.1 Nitrogen dioxide can react with organic peroxy radicals, one source of which are vehicle emissions, (formed from the breakdown of Volatile Organic Compounds in the air) to form PANs (peroxyacetyl nitrates), which can serve as a temporary reservoir for reactive nitrogen and may be transported long distances, persisting in the environment for a longer time than NO_2.

3.5.2 The annual mean objective of 40 μg/m^3 is currently widely exceeded at roadside sites throughout the UK, with exceedences also reported at urban background locations in major conurbations. The number of exceedences of the 1-hour objective show considerable year-to-year variation, and are predominantly driven by meteorological conditions which give rise to winter episodes of poor dispersion and summer oxidant episodes. In recent years, exceedences of the short-term objective have generally only been recorded at roadside or kerbside sites in close proximity to heavily-trafficked roads in major conurbations.

3.5.3 In practice, meeting the annual mean objective in 2005, and the limit value in 2010, is proving to be considerably more demanding than achieving the 1-hour objective. National studies have indicated that the annual mean objective is likely to be achieved at all urban background locations outside of London by 2005, but that the objective may be exceeded more widely at roadside sites throughout the UK in close proximity to busy road links. Projections for 2010 indicate that the EU limit value may still be exceeded at urban background sites in London, and at roadside locations in other cities.

4.0 Chipping Norton Draft Action Plan Consultation Summary

This section should be read with reference to the Draft Action Plan document.

4.1 The Consultation Period commenced with a static display for public viewing within Chipping Norton Town Hall, on Wednesday 27 February and Saturday 01 March 2008. There was also an animated presentation which gave the background to the process and an introduction to the consultation. Officers attended throughout to answer questions and explain the options and proposals. The attendees were invited to complete a questionnaire (Appendix 2) and use the post–its and paper provided to record any immediate thoughts and views they had on the subject.

4.2 Copies of the Draft Air Quality Action Plan were also circulated to key interested parties for consultation and others were advised by Email of the details of the proposals. A Council Officer gave three interviews for local radio and television. A full copy of the draft action plan together with the executive summary were provided on the WODC website.

4.3 During the public sessions the estimated number of people who visited the venue was in excess of 100. Of the literature available to take away on these two days (and over the next five weeks from the display within the Guildhall Town Centre Shop / Information Office), 35 AQMA Questionnaires were returned.

4.4 A general comment derived from discussion with members of the public was (the rather to be expected) "something must be done" (applicable to a variety of concerns) but a more fundamental sentiment was that this was an 'opportunity not to be missed' to address not just air quality but also the more obvious (and increasing) presence of large freight vehicles and the proximity of them to everyday life within the centre and immediate environs of Chipping Norton.

4.5 A suggestion which was raised during the consultation period involves a loop to the north of the Rollright Stones either cut into or constructed below the ridge line, overlooking Long Compton. This would be a modification to the proposed Cross Hands Lane Diversion and is expanded on within 4.1.3. The local Cllr for Chipping Norton requested that OCC (Highways Authority) investigate the financial viability of this proposal with specific regard to the availability of future funding.

4.6 Chipping Norton Town Council Committee Meeting

- On Monday 21 April 2008, two officers from WODC (Community Services) and OCC (Highways Authority) were invited to attend the Chipping Norton Town Council committee meeting where they gave a short presentation on the Draft Action Plan.
- The Council proposed , for the more immediate future, implementation of traffic control by signage, routing heavy traffic around an already existing 'by-pass' to the south and west by using the Oxford, A40, Northleach, A429, Moreton-in-Marsh route or similar.
- The introduction of additional weight restrictions on both the A44 and A361 through Chipping Norton were also recommended by the Town Council.
- Any one-way or tidal flow scheme or by-pass were strongly opposed.
- Utilising the New Street Car Park as a bus terminus was suggested in order to mitigate traffic congestion on West Street.

4.7 Comments received from Public Consultation Sessions

- Action should be a 'joined up approach' to include 'Safety' not just 'AQ' relevant to Horsefair
- relevant to London Road (where there is congestion in the morning and in connection with 'the school run')
- relevant to proximity of HGVs (with wide wing mirrors etc) and pedestrians
- relevant to the new hospital site entrance in London road and the effect of additional traffic flow in this area
- Cross Hands Diversion – option of a single direction loop for HGVs, effectively halving the number of HGVs transiting the centre of town.
- There is HGV 'black' route signage in neighbouring districts but not in the OCC area of responsibility
- Environmental Enforcement measures required to reinforce signposting
- An 'alternative route' via the proposed Cross Hands diversion is currently used during the period of the Mop Fair
- Road traffic weight sensors coupled to the Automatic Number Plate Recognition (ANPR) system – within the scope of modern technology
- Gating option would result in the 'impossible' situation of HGVs queuing up on New Street

4.8 AQMA Questionnaire: Summary of returns

The questionnaire is provided in Appendix 2.

Q1 Half of the respondents were in the 65+ age group

Q2 All respondents were 'local' to the area

Q3 Half of the respondents either worked / commuted through Chipping Norton and half did not (retirees?)

Journeys covered each weekday equally with the two periods between 07:00 and 16:00 the more common. There were a slightly smaller number of early departures with associated (?) late recoveries.

Cars and buses were marginally the preferred mode of transport over foot traffic (presumably by residents of the inner town area)

Q4 Social visits to the town were also equally spread throughout the week with a slight bias towards market day. The period 09:00 – 16:00 contained the majority of movements and there was also an apparent increase in foot traffic (presumably by residents of the inner town area) over buses and cars, all journeying less than 3 miles.

Q5 Few respondents (2) indicated that they owned a business in the area

Q6 Traffic was perceived to be the main source of air pollution in Chipping Norton

Q7 Those proposals thought to have the potential for the greater beneficial effects include: (number of elections)

- Cross Hands Diversion (29)
- Signing Diversions / Alternative Routes Scheme (23)
- Engaging with Freight Operators (17)

The next more favoured were:

- Neighbouring County's Local Transport Plans
- Promote School and Green Travel Plans
- County Bus Strategy
- 'Leave your car at home'

Q8 **Positive Effects other than AQ**

Road Safety	Removal / mitigation of significant potential dangers
Weight restriction	The most positive (dramatic) beneficial effect
Congestion	Relief for the town centre area
Quality of Life	Improved ambience of town centre

Q8 **Negative Effects other than AQ**

Switch off idling engines	Unlikely to work / difficult to enforce
'Leave car at home'	Adverse driver reaction
Diversion	May affect business prosperity and viability of smaller shops important to the 'feel and diversity' of the town The target is commercial 'through' traffic – must remain 'user friendly' to visiting and trade traffic
Economy	Loss of casual / out of town visitors routed away
Gating Scheme	Long queues, slower transit times, driver frustration
Publicity	Adverse comments if an Ancient Monument was to be affected

Q9 **Positive Effects - Personal**

Health Benefit	Reduces a potential causal factor for asthma sufferers
Noise	Reduction in traffic noise with fewer HGVs
Fossil Fuels	Safeguarding the environment for future generations
Road Safety	Safer crossing from the New Street car park to town

Negative Effects – Personal

Cycling	A limited option possibly excluding the older / less fit
Gating Scheme	Queuing and idling engines elsewhere
'Leave car at home'	Not an option for older or less fit people

Q10 Of the 15 remaining options, some 12 were considered to have some merit however the only one with significant support was the 'Bypass' option

Q11 Further Comments

Weight limits (10 Tonnes ?)
Length limits
Low Emission Zones
20mph speed limit though town
Traffic calming
More car parking to the NE of town relieving demand on New Street
Improved signage by the mini roundabouts at the end of London Road
Promotion of Bus transport

- Bus scheduling to obviate prolonged stationary idling at bus stops

The Cross Hands diversion to include a loop around the Rollright Stones
Sat Nav programming to amend software to promote alternative routes
As Chipping Norton is growing it is also dying.
Consider the effect of A361 traffic to / from the south via Burford Road

4.9 Response from Consultees

Amongst the observations raised by the various consultees, significant concerns covered areas which dealt with ancient monuments, the natural environment and wildlife and commercial transport routes connected with the proposed Cross Hands Lane Diversion option.

4.91 Natural Environment

The OCC Ecology Planner commented on the environmental impact of any road improvement scheme.

Warwickshire County Council (Museum Field Services) made similar observations and pointed to the eventual need for a mitigation strategy to reduce the impact to wildlife of any change to existing road patterns whilst also, from a safety aspect, reducing possible conflict hazards between animals and vehicles.

4.92 Transport Routes

Warwickshire County Council (Transport Planning Unit) expresses concern with regard to the possible effect of changes to the Advisory Lorry Route Map (2005 Edition)

Woodstock Town Council (and by extension 'A44A', an action group advocating the downgrading of the A44, amongst other proposals) considered the proposals in the context of the A44 remaining a Primary Route as opposed to re-designation and alternative routing of HGV traffic

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4.93 Scheduled Ancient Monuments

As affected by the Cross Hands Lane Diversion proposal, there are two Scheduled Ancient Monuments. English Heritage makes the point that further development of the road in the vicinity of the Rollright Stones would have to consider disturbance of the ground (affecting buried archaeological deposits), tranquillity of the area (and the setting of the monuments in the wider landscape) and mitigation of potential road hazards to visitors to the area.

4.94 The Rollright Trust

Significant development around the Rollright Stones has been achieved to improve access to the Stones and the amenity value of this attraction. The scope of the Draft Air Quality Action Plan was adversely commented upon with regard to the limitations of consultations and the consideration of plan's implications on this historic site of national importance.

4.95 Department of the Environment Food and Rural Affairs

Defra concluded that consideration of the following is advised in the completion of the Action Plan.

- The air quality assessments and results of public consultation will provide further useful information for the final draft.
- Specific actions, timescale and indicators should be developed for each measure and targets should be identified if possible. This will clearly focus action and performance success towards meeting the aims of the Action Plan. Where this is not practicable now, a commitment to identifying such should be made. This work should start with the most highly prioritised measures in the plan.
- The air quality emission reductions for the actions should be calculated where appropriate. Where not possible within the action plan development West Oxfordshire should consider whether it can commit to surveys or feasibility studies on the priority traffic management options in order to produce these calculations at a later time (e.g. in an annual progress report).

Table 3 List of Consultees

Consultee	**Organisation / Address**
Defra	Air and Environmental Quality Division
Local Authorities	• Warwick District Council • Cotswold District Council • Cherwell District Council • Vale of White Horse District Council • Oxford City Council • Stratford-on-Avon District Council
Environment Agency	• Environment Agency, External Relations Department
County Councils – Highways and Planning	• Oxfordshire County Council • Gloucestershire County Council • Warwickshire County Council
Oxfordshire Primary Care Trust	• Public Health Department
The Rollright Trust	• Chairman
Town and Parish Councils	• Woodstock Town Council • Chipping Norton Town Council
Action Groups	• A44A Convenor
Trade Associations	Mr L Boyle Road Haulage Association [Southern Region] Mr G Telling Freight Transport Association [Southern Region] Marketing Manager Chipping Norton Town Partnership
Media	Chipping Norton News

4.86 A full copy of the consultation and the responses to it are available from the Council offices upon request. Private individual's details are kept confidential.

5.0 Summary and overview of air quality modelling of traffic management Options

5.1 Scope/Purpose

5.1.1 This section provides an executive summary of the Faber Maunsell Report, entitled 'Chipping Norton Air Quality Assessment', interpreting the results obtained from this document in the context of the recent public consultation. This summary is not designed to provide a critical analysis of the report nor comment on any data quality issues encountered.

5.2 Relevance

5.2.1 Air Quality modelling is an integral part of local air quality management; it allows Local Authorities with limited monitoring networks to predict concentrations of air pollutants at multiple locations simultaneously. Modelling predictions produced by Faber Maunsell form an integral part of the Air Quality Action Plan (AQAP) drafted by West Oxfordshire District Council. The data provided by Faber Maunsell modelling projects has been utilised for the following purposes:

- Determination of the AQMA extent.
- Providing quantitative data, which allows WODC to formulate relevant strategies to reduce the concentration of air pollutants in Chipping Norton.
- Predicting the impact that proposed reduction strategies will have on the future Air Quality of Chipping Norton.
- Providing accurate data to stakeholders at the consultation phase.
- To predict the likelihood of WODC meeting its commitments in relation to the EU Daughter Directive and National Air Quality Strategy.

5.2.2 The Faber Maunsell Report, commissioned by WODC, strongly underpins the air quality reduction strategies proposed in the AQAP. When making a policy decision as to which reduction strategy, or combination of strategies, is the most effective and proportionate, it is necessary to understand the conclusions and implications of this document.

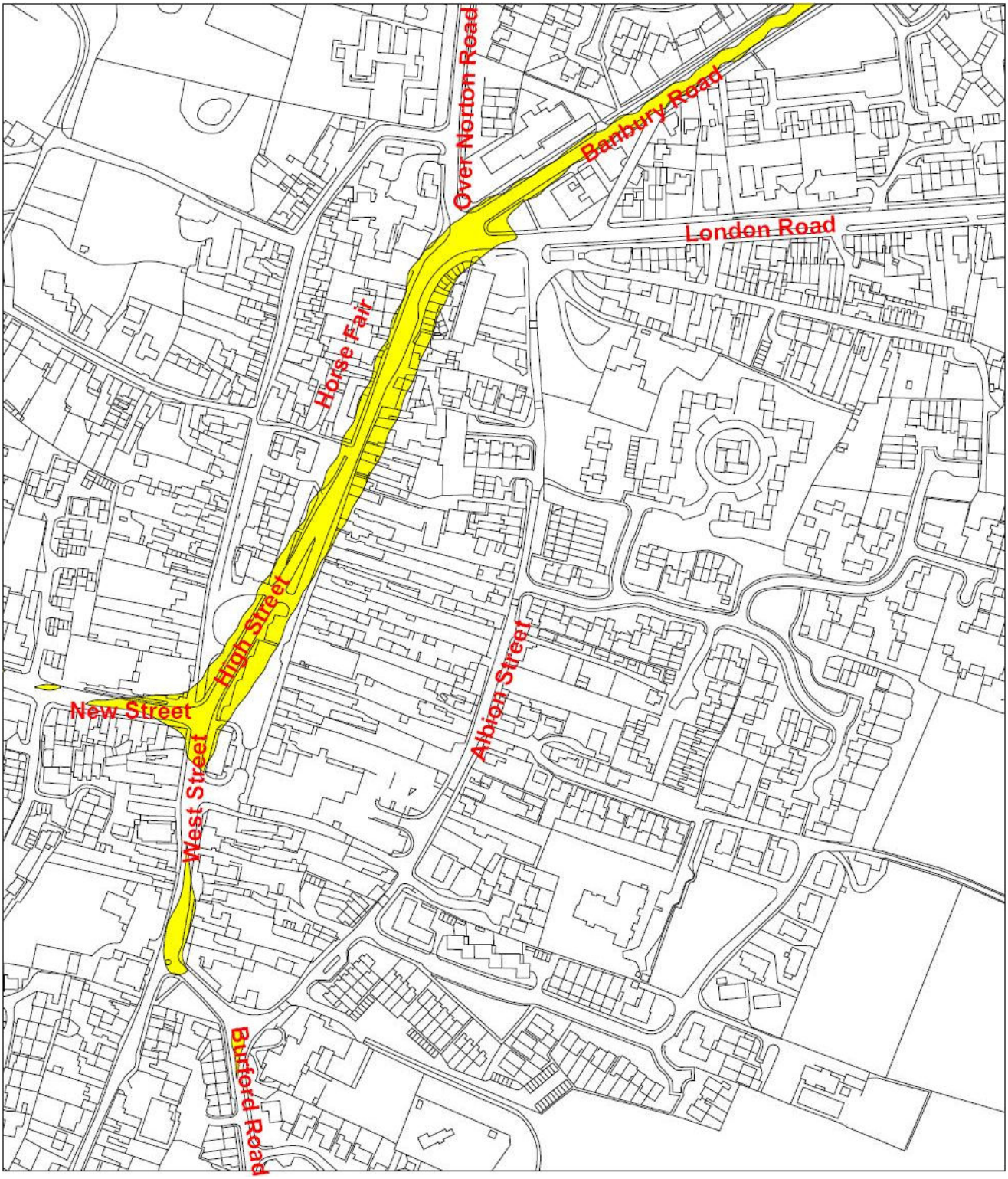
5.3 Background

5.3.1 The Draft AQAP presented a number of options which were anticipated to improve air quality in the locality of Chipping Norton High St and Horsefair, which is presently designated as an Air Quality Management Area and depicted below in Figure 1.

5.3.2 To better inform the Local Authority and its stakeholders as to the temporal and spatial extent of the air quality issue, alongside the potential impact the Local Authority's proposed options may have on the air quality within the management area, WODC commissioned Faber Maunsell o produce a predictive modelling study. The study considered 3 individual options alongside the impact of reducing HGV numbers by various magnitudes, specified by the County Council. An additional scenario was also selected, to provide a predicted baseline case, where no local / regional options were adopted, therefore solely considering national trends and emission reduction programmes.

5.3.3 WODC is committed to reducing emissions of NO_2 to 40μgm^{-3}, measured as an annual average, within its district by 2010. This limit value is stipulated by the First European Daughter Directive 1999/30/EC.

Figure 1

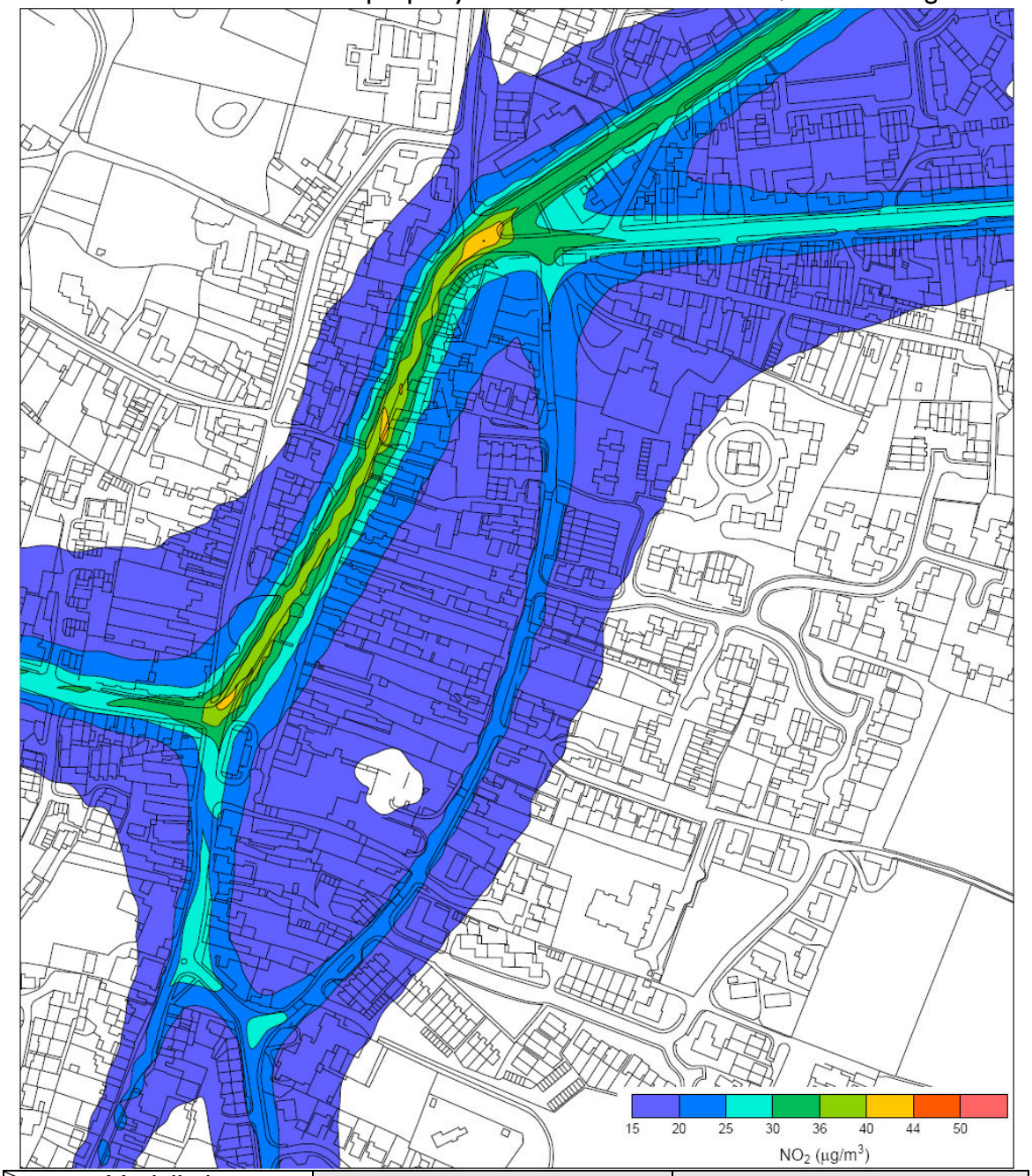


5.4 Results

5.4.1 The results of the Faber Maunsell report are presented by scenario. An ensuing summary integrates and presents the findings in the context of the public consultation.

5.4.2 Scenario 1 – 2010 Do-minimum Baseline

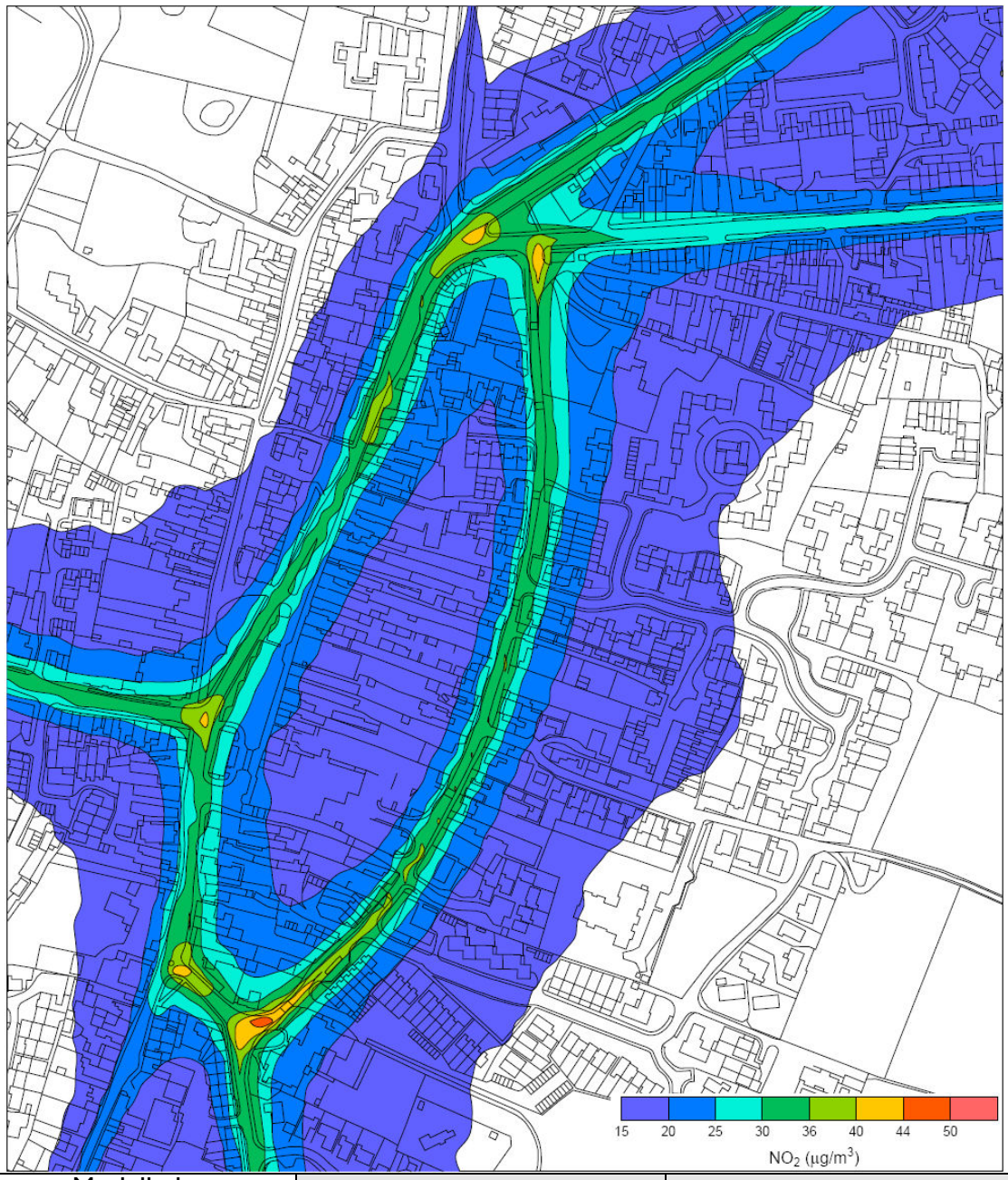
Modelling predictions indicate the extent of the AQMA will decrease as a result of this policy decision. Consideration of the plots provided in the report indicate that the 2010 scenario's 36µgm^{-3} NO_2 plot (which has been used as a conservative estimate of where the NO_2 objective may be exceeded) covers a much reduced number of residential property facades than the 2006 data, shown at Figure 4.



Modelled / Baseline Scenarios	2006	2010
Do-minimum Baseline	Significant reduction in NO_2, particularly on Horsefair, High St and their associated junctions.	Identical

5.4.3 Scenario 2 – Gyratory Scenario

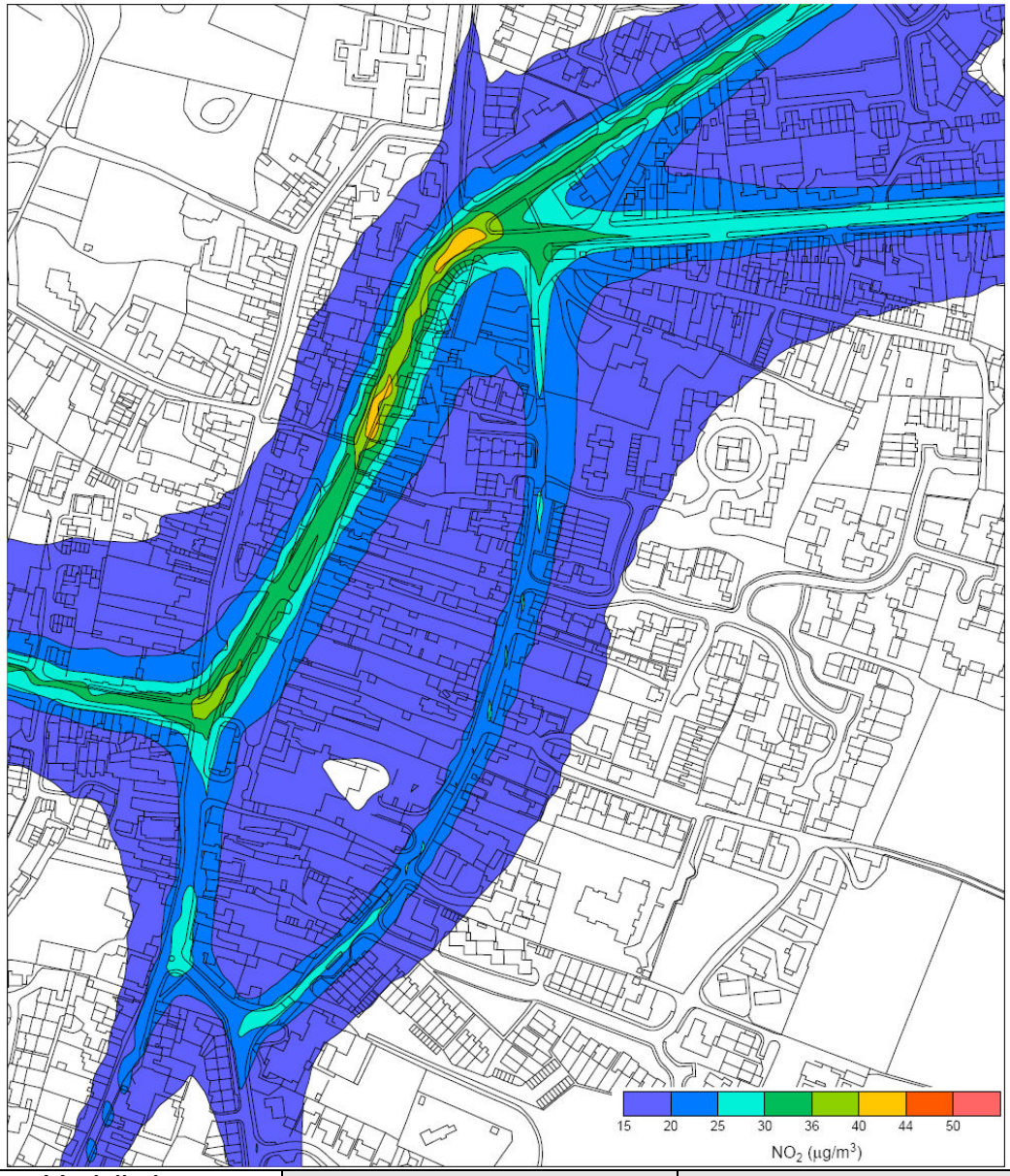
Modelling predictions indicate that adoption of this option will significantly reduce the concentration of NO_2 along High St and Horsefair in comparison to the 2006 and 2010 baseline cases. The system does, however, significantly increase NO_2 concentrations on Albion St and its associated junctions. The modelled increases do not appear to exceed the Air Quality Objective for NO_2 at property facades on Albion St.



Modelled / Baseline Scenarios	2006	2010
Gyratory Scenario	Significant reductions in NO_2 on Horsefair and High St but increases in NO_2 on Albion St and its junctions.	Significant reductions in NO_2 on Horsefair and High St but very large increase in concentration on Albion St.

5.4.4 Scenario 3 – Gating Scenario

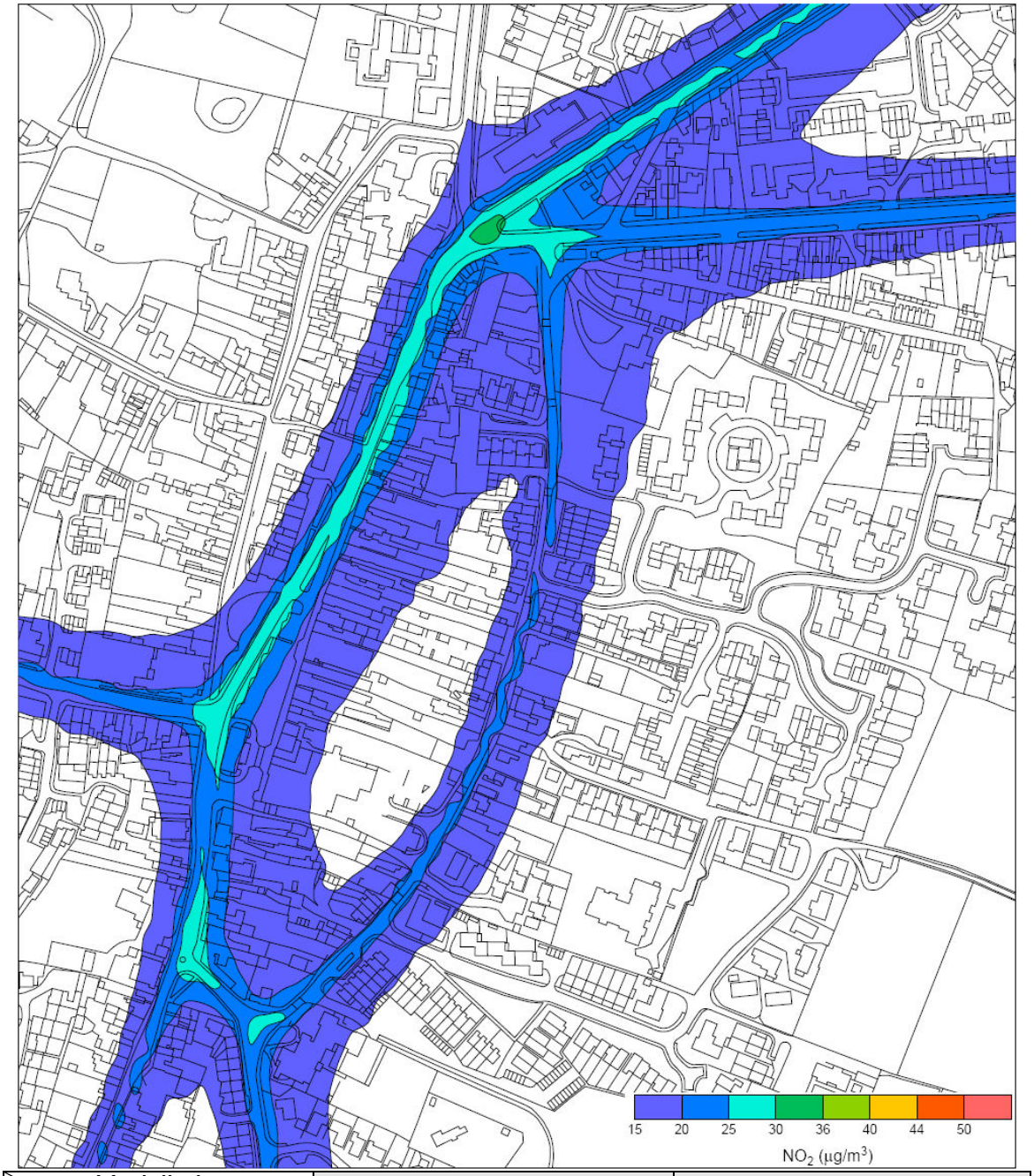
The modelled scenario indicates that adoption of this option will result in a marginal decrease in NO_2 concentrations experienced on High Street and marginal increases in NO_2 concentrations on Albion Street. The Modelling plot also identifies the Gating option will result in a marginal increase in NO_2 concentration in the vicinity of Horsefair in comparison to the 2010 baseline scenario. Predictions indicate the levels experienced in High St, Horsefair and Albion St will be significantly lower than 2006 levels should this option be adopted.



Modelled / Baseline Scenarios	2006	2010
Gating Scenario	Significant reduction in NO_2 concentrations on High St and Horsefair. Marginal reductions experienced on Albion St.	Marginal reduction on High St, marginal increase in NO_2 concentration on Horsefair and Albion St

5.4.5 Scenario 4 – Bypass Scenario

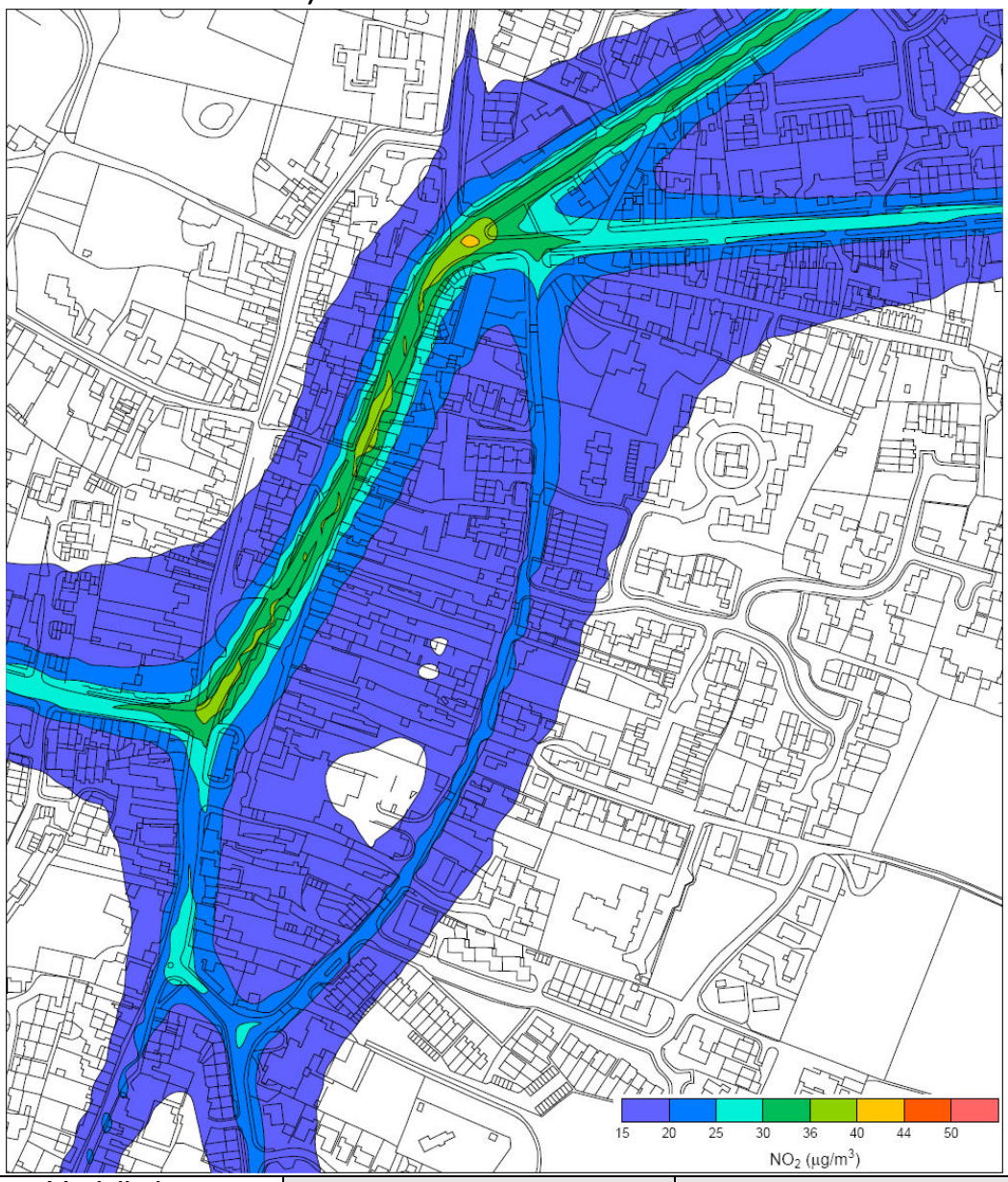
Modelling plots associated with this option, identify significant reductions in NO_2 concentrations across the entirety of the AQMA and its adjoining junctions. It is the only modelled scenario which indicates with certainty that the AQ objective for NO_2 will be complied with by 2010.



Modelled / Baseline Scenarios	2006	2010
Bypass Scenario	Very large reductions in NO_2 concentration Across the entire AQMA.	Significant reduction of NO_2 concentrations in High St and Horsefair, marginal reductions experienced in Albion St.

5.4.6 Scenario 5 – HGV reduction

Modelling of the reduction in the number of HGVs passing through Chipping Norton was not designed to be a viable option independently, rather to compliment and augment other scenarios. Reduction in HGVs by 5, 7 and 15 percent indicates the concentration of NO_2 modelled in the AQMA will decrease with increasing Numbers of HGVs removed from the road. The data identifies a reduction of 15% would be required to facilitate a tangible decrease in NO_2 concentration (plot provided below). It is noted that should this scenario be adopted as an independent policy measure, it would not enable WODC to meet its commitments by 2010.



Modelled / Baseline Scenarios	2006	2010
HGV reduction	Significant reductions in NO_2 modelled on Horsefair and High St. Marginal reductions on Albion St	Marginal decrease in NO_2 concentration in High St and Horsefair.

5.5 Summary

5.5.1 Compliance with EU Daughter Directive:

	Will The Scenario Facilitate WODC Meeting Its Obligations Under EU Daughter Directive by 2010?	
Scenario 1 – Do-minimum	Marginal	the facades of a small number of properties are predicted to exceed the Air Quality Objective for NO_2
Scenario 2 – Gyratory System	Marginal	2 properties are predicted to exceed the Air Quality Objective for NO_2.
Scenario 3 – Gating System	Marginal	Similar to Do-minimum scenario, the facades of a small number of properties are predicted to exceed the Air Quality Objective for NO_2.
Scenario 4 – Bypass Construction	Yes	No property facades are predicted to exceed the Air Quality Objective for NO_2.
Scenario 5 – HGV reduction	Marginal	Similar to Do-minimum scenario, the facades of a small number of properties are predicted to exceed the Air Quality Objective for NO_2.

5.5.2 Public Perception of Modelling Results:

	General Public Perception in relation to the modelled options?	
Scenario 1 – Do-minimum	Opposed	Public generally opposed to WODC not taking any form of action – it doesn't address any of the non air quality related issues such as noise vibration and public safety.
Scenario 2 – Gyratory System	Opposed	Public strongly opposed to this proposal, due to the unsuitability of Albion St for HGVs and the increase in NO_2 emissions from increased traffic presence. As a consequence WODC has not considered this a viable option for further consideration.
Scenario 3 – Gating System	Non-committal	Public were non committal in relation to this option. A small number of replies were strongly opposed to the perceived increased idling time resulting from traffic management.
Scenario 4 – Bypass Construction	Approve	Public strongly approve of physical removal options (opposed by the Town Council); WODC must consider if the cost incurred by this solution is proportional to the extent of the air quality issue. WODC may consider the total benefit to residents of a reduced traffic flow to outweigh the construction costs.
Scenario 5 – HGV reduction	Approve	Public strongly agree that HGV numbers should be reduced, this has led to the evolution of the publically supported signage option.

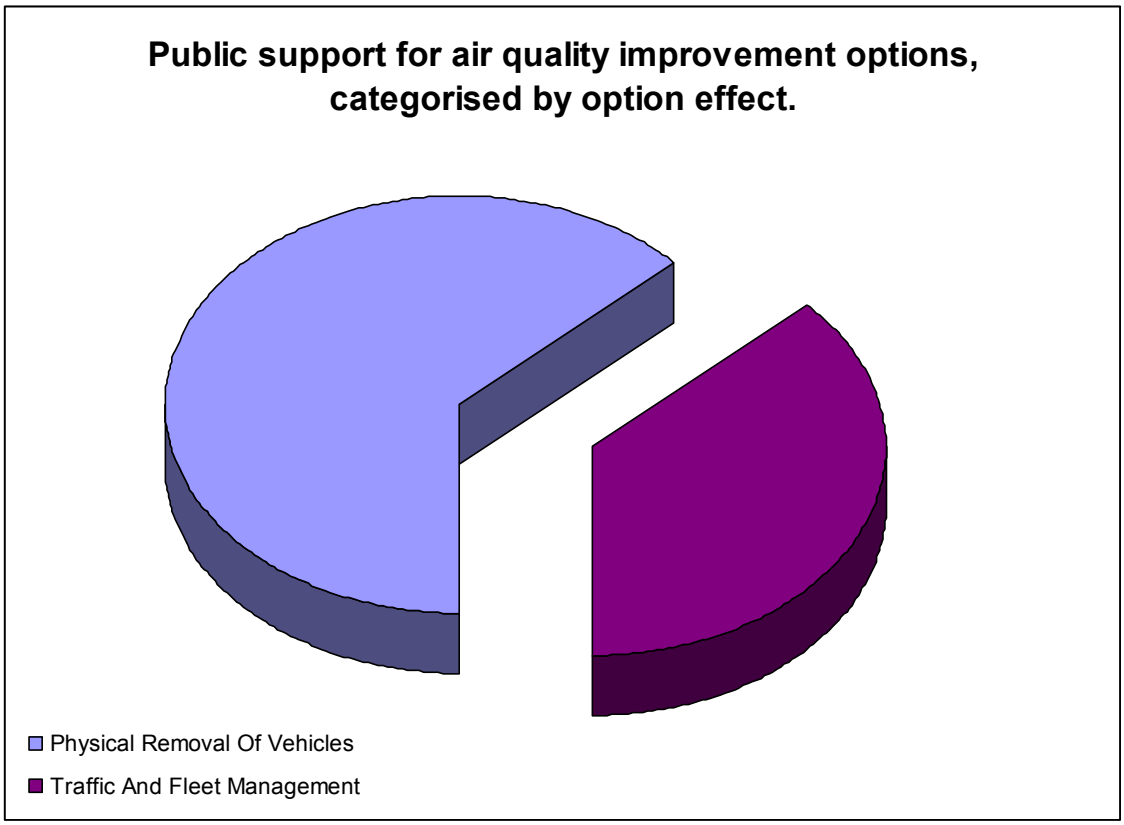
5.6 Concluding Remarks:

5.6.1 Data elicited from the modelling report was initially presented to the public during two consultation events held at Chipping Norton Town Hall. Consultation with the public confirmed that problems relating to the transport infrastructure in Chipping Norton did not relate to air pollution in isolation.

5.6.2 The public strongly supported schemes which resulted in the removal of HGVs from the town centre, exemplified by the approval of Scenarios 4 and 5. Modelling data supported both of these strategies to reduce NO_2 emissions and was therefore accepted as strong evidence for physical removal of HGVs from the AQMA.

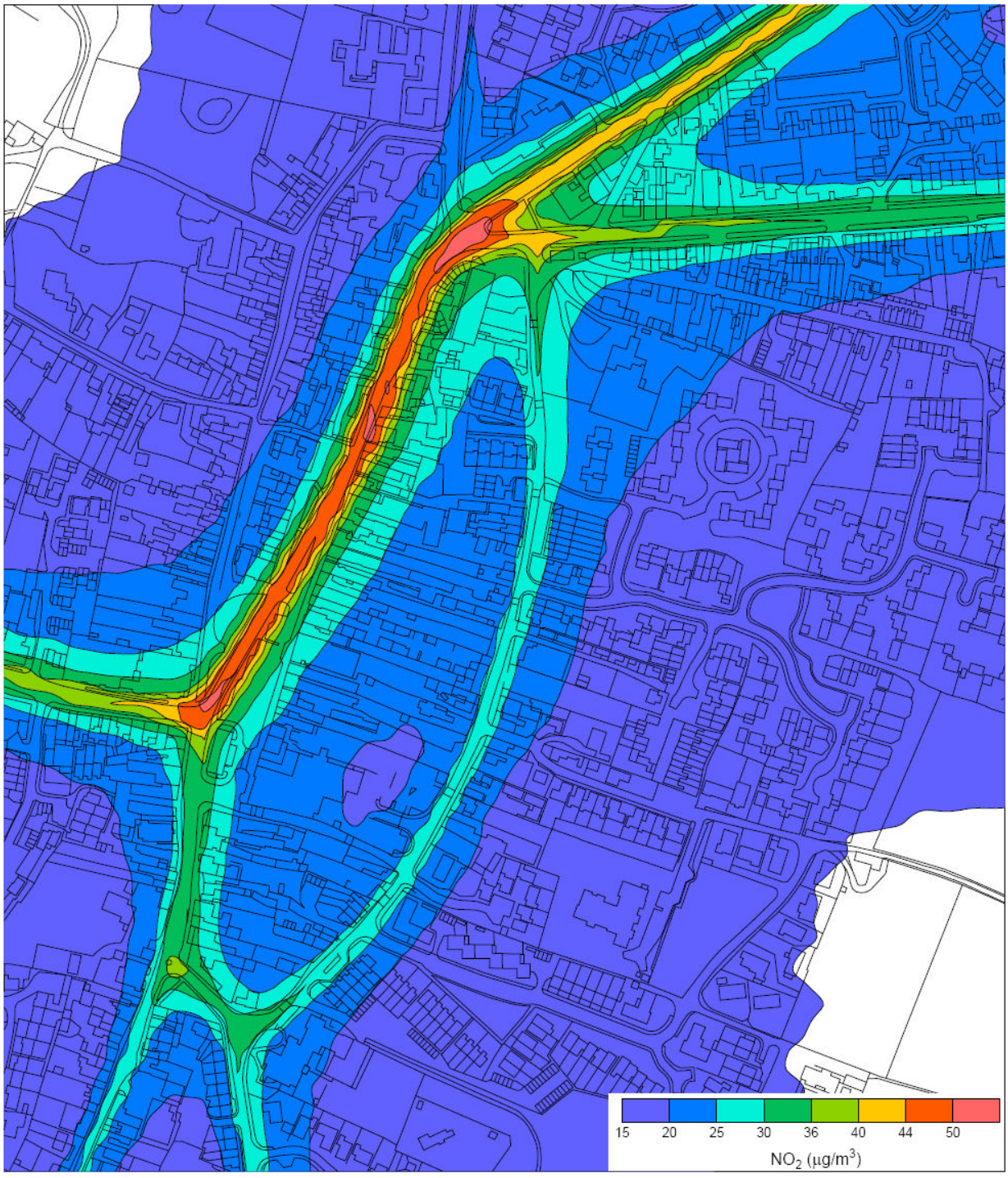
5.6.3 Conversely, identical modelling data indicating the present air quality issue would be marginal by 2010, was met with some degree of scepticism; the public remained of the opinion that it was proportionate to construct a bypass or impose weight restrictions to remove the majority of HGVs and surplus traffic. The disparity between physical traffic removal from Chipping Norton town centre and traffic regulation are exemplified below in Figure 3. Physical removal of vehicles possesses the greater share of public support, despite only constituting 5 of the 13 options to improve air quality.

Figure 3



5.6.4 Despite predictions that Air Quality would improve due to the introduction of cleaner vehicles, fuels and retrofitting of aging vehicles, opposition to Scenario 1 was expected, as noise, vibration and public safety issues attributable to Heavy Goods traffic will remain. Scenario 1 fails to address issues not related to Air Quality; as a consequence it does not facilitate integrated problem solving for traffic related problems experienced by residents of Chipping Norton, who appear reluctant to give this option their support.

Figure 4 – 2006 Chipping Norton Air Quality Modelling Predictions



6.0 Action Plan Proposals

This section details the range proposals of aimed at reducing nitrogen dioxide air pollution. The costs and benefits of all proposals have been considered and are detailed in the Draft Action Plan. Each proposal or set of proposals is followed by a table summarising the supporting measures and the likely timescales for their implementation.

6.1 Appraisal of Oxfordshire County Council Traffic management proposals

The following section is the appraisal by Oxfordshire County Council of their traffic management options which has resulted in their decision to pursue proposal 1, the HGV re-routing proposal. It is extracted from the Cabinet report recommending approval of the HGV reduction strategy to members.

6.1 Bypass Options

6.1.1 As the main cause of the emission is through lorry movements a bypass could be expected to resolve the problem. As a result of this, an investigation into whether a bypass was a practical solution to the problem was conducted. This investigation showed that there were a number of options for a bypass which would be likely to be deliverable in engineering terms but that the cost for any of these would be considerable (ranging from £11.3 million to £36.6 million), that they would probably take 10 years to deliver and would have significant environmental impacts within the Cotswolds Area of Outstanding Natural Beauty. Consequently, these were excluded from the options considered at the public consultation.

6.1.2 As part of the same investigation the possibility of upgrading the existing road between the A3400 and A44 (Cross Hands Lane) was considered. This could be done through a 1.8 metre widening of the road along most of its length, together with improvements to the junctions at each end of the lane. In engineering terms this would be simpler and probably quicker than building a new bypass and was estimated to cost approximately £4.9 million. It would though be likely to have a major impact on the Rollright Stones Scheduled Ancient Monument, through which the road passes. The use of this route to take traffic away from the town was the most supported option at the public consultation.

6.1.3 At the consultation an alternative was suggested which bypasses the Monument to the north. While this might avoid direct impact to the Scheduled Area this could still have an impact on the setting of the Stones. By going off-line the scheme would need to follow the processes for building new roads, lengthening the time for delivery. The new road would also be in Warwickshire and agreement would also be needed with that county to allow this work to take place (this would also be the case for the eastern section of the on-line improvement). Such a scheme would still require the majority of the on-line upgrading and would probably add at least £2 million to the cost of the scheme. This would take the scheme above the level that could be reasonably funded from local sources and would therefore require support through the regional major schemes processes. Annex 2 shows a checklist against the most recent criteria for regional prioritisation. It is not considered that this scheme would be likely to be successful in this process. Given this, it cannot be recommended that the Cross Hands Lane improvement option, or the suggested alternative, be included in the Action Plan. If a bypass was to be considered in the future for Chipping Norton (it might be included in considerations for the period after 2020 in the Transport Networks Review) then the suggested alternative should be submitted as a possible route for this.

6.2 Gyratory System

6.2.1 This option would involve using Albion Street as part of a one-way system around the town centre; Horsefair and High Street would become one-way for traffic travelling toward Oxford and Banbury, with Albion Street taking the traffic travelling toward Evesham and Burford. A scheme such as this would cost between £250,000 and £400,000, depending on the extent of the measures it was decided to carry out on Albion Street. While this would improve conditions on Horsefair it would be likely to create new air quality problems at the Albion Street / Burford Road / West Street junctions. Traffic modelling also suggested that this option might also cause congestion problems at various points along the route which, given the constrained nature of the town, would be difficult to resolve. This option was not therefore put to the public consultation.

6.3 Gating scheme

6.3.1 This scheme would introduce traffic signal control at the edges of the town centre and only allow traffic into High Street/Horsefair when there was a free passage through the town centre. The gating signals would need to be controlled in conjunction with the pelican crossing to make the best use of the system. The overall cost of such a system would depend on precise system specification but would probably be in the range £150,000 to £250,000. Air quality predictions of this option show marginal decreases in NO_2 concentrations in High Street balanced by marginal increases in Albion Street and New Street. A major drawback of the scheme would be that congestion would be re-located from the town centre onto roads which do not experience them currently, such as Banbury Road and London Road. The public acceptability of such a scheme would be questionable and there was little enthusiasm for such a scheme at the public consultation – the impact of additional traffic queuing uphill on New Street was cited as a particular concern. It is therefore not considered that this option should be included in the Action Plan.

6.4 HGV Routeing: **Proposal 1 of Summary table.**

6.4.1 The major source of the emissions has been identified as being due to heavy goods vehicles. The great majority of heavy goods vehicles in the town are through vehicles. Reduction in HGVs would therefore directly reduce exposure in the town. Modelling of the 2010 situation shows that a reduction of 15% in HGVs would be required to gain any tangible impact on concentrations and that a larger reduction would be required to enable the AQMA to be wholly de-designated. The effectiveness of lorry routeing measures is variable, largely depending on local circumstances and the attractiveness of alternative routes, and the level of reduction which any measures would be likely to achieve is difficult to predict.

6.4.2 An advisory route is already in place for longer distance vehicles on the A44 so if this option was to be followed then greater controls would need to be imposed. The most straightforward method of controlling heavy goods vehicles would be through the imposition of an environmental weight limit through the town. To be effective this would require advance warning and signing of alternative routes. For A44 traffic this could use the existing advisory route via Northleach. For traffic travelling to Banbury via A361 there are no obvious alternatives and this would need to be negotiated with the relevant neighbouring authorities. A weight restriction is already in place on the parallel A3400 through Compton so this route would not be suitable.

6.4.3 A complicating factor to this is that the A44 is designated as the national Primary Route between Oxford and Evesham. While this does not preclude the imposition of a weight limit there would be a contradiction if a restriction was placed, given that Primary Routes are a major component of the National Lorry Route Network. This would be likely to place a limit on the level of compliance with any local restriction. Removal of Primary Route status from the A44 would require the designation of an alternative Oxford-Evesham Primary Route with the agreement of the relevant highway authorities and government offices. There would also be considerable cost given that this would require the replacement of green backed signs with white ones – without which the change in status would not be evident to drivers.

6.4.4 Enforcement is a considerable issue with any environmental weight limit given that the general exception for access makes identification of offending vehicles very difficult. This would be particularly the case for a limit in Chipping Norton where the alternative routes would represent a considerable increase in both distance travelled and time taken. Given that this limit would be imposed for air quality reasons a Low Emission Zone could also be designated in the area. There is little experience of how such zones might operate in practice but they could allow for better control over the most polluting vehicles.

6.4.5 Measures to re-route lorries away from the town were generally well received at the consultation.

6.4.6 From this analysis the option which appears to be the most suitable for inclusion in the Action Plan are measures to control lorry passage through the town. It should be stressed in the Action Plan that all of these measures will require the consent of neighbouring authorities, which cannot be guaranteed, and that the effectiveness of such measures in reducing lorry numbers is variable.

The measures will require additional investigation before specific proposals can be submitted for approval. This investigation will include:

- imposing an environmental weight limit, including the scope and extent of any limit, costs, timescales and consultation with neighbouring and other affected councils;
- the processes involved in alterations to the Primary Route Network and the costs and timescales involved in making any such changes
- whether there would be any additional benefits in enforcement terms to supplementing the weight limit with a Low Emission Zone.

The results of these investigations would then form a supplement to the Action Plan which would in turn be submitted to government.

6.5 RECOMMENDATION to OCC Cabinet member for Transport

The following was recommended to OCC Cabinet.

1. The Cabinet Member for Transport is RECOMMENDED to:

(a) Support preparation of an Air Quality Action Plan for Chipping on the basis of measures to reduce lorry movements through the town as the principal action;

(b) request West Oxfordshire District Council to make it clear in the final Action Plan document that the details of any such measures are dependent upon the results of further investigations as outlined in the report; and

(c) authorise the Head of transport, in consultation with the Cabinet Member for Transport, to approve a final Action Plan document, on this basis, for submission to government by West Oxfordshire District Council.

The following was added at the meeting:

(d) consider the case for submitting a bid for regional prioritisation for funding of a more significant scheme when an opportunity arises and once the measures referred to in (a) above, including routeing and weight limits have been carried out and assessed.

Table 4 Supporting measures to Proposal 1

Proposal Measures	Timescale	Indicator
Consultation with neighbouring authorities about HGV routes	July 2009	Consultation report Agreement in place
Imposition of environmental weight limit and replacement of appropriate signage	December 2009	Report to Cabinet of OCC Decision by Cabinet of OCC
Investigation into integration of Low Emission Zone to support the environmental weight limit	Report by December 2009	Agreement between WODC and OCC regarding officer to conduct research Report to Steering Group Consultation on report Recommendation to Cabinet of OCC
Development of Enforcement Action Plan	Report by December 2009	Reports to Cabinets of District and County Council

6.5 Proposal 2 Bypass proposal.

The success of the re-routing proposals, not least the ability to implement them effectively, will be monitored closely. If they prove unsuccessful, then alternative significant schemes (road proposals) will have to be re-considered, although the focus would also be around strengthening the support to the re-routing options.

6.6 Proposal 3

Continuously monitor nitrogen dioxide air pollution in Chipping Norton, reporting annually.

Equipment to continuously monitor nitrogen dioxide air pollution is located at High Street Chipping Norton. The information is uploaded, analysed and reported on regularly and is used to model and predict future levels of air pollution under a variety of scenarios which have been explored further in section 5. It is considered important to continue monitoring nitrogen dioxide air pollution in the air quality management area for a number of reasons:

- Assess the accuracy of modelled predictions
- Identify trends
- Assess the success of the improvement measures.

The continuous monitoring is supported by nitrogen dioxide diffusion tubes, located within the AQMA (plus a number of background locations) which are an inexpensive method of assessing trends in air pollution.

Table 5 Supporting measures to proposal 3

Proposal Measure	Timescale	Indicator
Continuous Monitoring of nitrogen dioxide air pollution	Ongoing	Analysis and reporting of data in - • Update and Screening Assessment 2009 • Subsequent Annual Reports
Nitrogen dioxide diffusion tube monitoring	Ongoing	Analysis and reporting of data in - • Update and Screening Assessment 2009 • Subsequent Annual Reports

6.7 Proposal 4

Establish steering group made up of officers, elected members and members of the public to monitor the progress of the action plan.

The action plan contains a number of measures where principal responsibility for delivery rests with officers from both WODC and OCC. It is important to ensure that these measures are implemented and having a body responsible for overseeing them will aid that process. The body can ensure the action plan is reported on at least annually and they can develop any modifications to the plan that become necessary in the light of current information.

Table 6 Supporting measures to proposal 4

Proposal Measure	Timescale	Indicator
Establishment of Steering Group	December 2008	Agreed terms of reference for the group
Action Plan progress report	Annually	Delivery of progress report

6.8 Proposal 5 (5a to 5f) WODC initiatives promoting sustainability, linking the Action plan with the Climate Change Strategy.

6.8.1 Alongside reduction of harmful polluting emissions in Chipping Norton, the Council is considering how to reduce CO2 emissions as part of its climate change work. The two areas of particular focus for this work will be in Chipping Norton and Witney because of the AQMA declarations. There is a strong push to get local people out of their cars and using more sustainable forms of transport. The Council's Green Travel Plan promotes local cycle and walking routes and alternative forms of transport to the car to Council staff, councillors and residents of the district. This will be updated in early 2009, and the Council commits to working with local employers in Chipping Norton on their own Green Travel plans by early 2010. This will be supported by a number of other initiatives aiming to increase cycling and walking into the town centre and will be part of the Council's Climate Change Communications group's work in late 2009.

The work that the Council is doing in the Climate Change policy will compliment this Action Plan by targeting Chipping Norton in the first instance for all reduction of car usage work and working with residents to change travel behaviour.

6.8.2 Proposal 5a and 5d
Lobbying and support of Government to create policy to increase the use of cleaner vehicles and fuels.-
WODC and OCC to support "Leave your car at home" initiative.

The Government has over the years introduced policies aimed at reducing vehicle use and at the same time required manufacturers through tighter emissions standards, to improve the technology of engines. Tax penalties for high polluting vehicles and tax breaks for lower polluting vehicles have been introduced. However, an integrated transport plan for the UK is not yet in place, particularly one which reduces car use in favour of public transport and grants aimed at helping motorists to shift to cleaner technologies are not readily available.

The Energy Saving Trust now has several grants available for the following programmes:

Low carbon research and development

A grant to help support the development of new low carbon vehicle technologies.

Funding for alternative refuelling stations and electric recharging points

Offering grants to organisations to help them install refuelling or recharging stations for alternative, cleaner fuels.

In addition, the Energy Saving Trust holds the Power Shift register - the authoritative source for information regarding vehicles that are eligible for a discount from the Transport for London congestion charge scheme. However, there is little funding or incentives available for the individual business or motorist to convert or change their vehicle to a type with a cleaner technology.

The Council therefore has a role to play in monitoring Government policies, commenting and in particular lobbying the Secretary of State for improvements to proposals it considers misguided. There are a number of mechanisms for doing this:

- Officer or member response to government consultations
- Councillors at a district and County level to lobby the Secretary of state on specific issues
- Officer groups such as the three Counties Thames Valley Environmental Protection Advisory Group to coordinate responses to Government Policy
- The Oxfordshire local authority Group developing the Oxfordshire Local Air Quality Strategy to comment on policy and proposals.

The Council each year supports Green Transport Week which aims to promote initiatives ideas and awareness concerning people's use of transport. Promoting local walks, awareness about local public transport, the use of travel plans, better driving techniques etc all form part of the week. These of course are local initiatives that are regularly applied in the hope of gradually changing people's attitude towards transport. They also focus on the Climate Change issue, but such local measures must be backed up by strong policies at a national level if a true difference is to be made, hence the need to lobby government on such matters.

6.8.3 Proposal 5b

Engage with local public transport operators (buses and Taxis)

a) promote the procurement of vehicles with cleaner engine technologies and
b) to promote the use of cleaner fuels

As part of the Route 20 improvements described in proposal 12 below, 6 highly visible double-deck buses with Euro-4 engines will be based in Chipping Norton from spring 2008. This complements the Optare Solos, also with Euro-4 engines, introduced on the 488 Banbury route in 2005. The standard for the vehicles used on routes to Charlbury and Kingham can be addressed at the next review of the services in December 2008.

6.8.4 Proposal 5c

Engage with freight transport operators.

a) promote the procurement of vehicles with cleaner engine technologies and
b) to promote the use of cleaner fuels.

Oxfordshire County Council and West Oxfordshire District Council both have regulatory responsibilities for the issue of licences for the operation of these vehicles. There is therefore the opportunity to engage the operators to consider improvements to their fleet and put them in touch with organisations such as the Energy Savings Trust. Also their licence conditions can be reviewed to incorporate where appropriate measures to reduce emissions

6.8.5 Proposal 5f

Development of School Travel Plans and promotion of WODC Green Travel Plan

The Green Travel Plan – in line with the Council's Environmental Management Strategy and (proposed) Climate Change Policy – can be used to help negate the issues caused by traffic in Witney.

The school run is often a period characterised by congestion and inconvenience, and a reduction in traffic often occurs during school holidays. Promoting school travel plans may therefore help to raise awareness with staff, parents and pupils and help reduce levels of traffic at the beginning and the end of the school day. Any initiative which reduces car use helps also to reduce carbon dioxide emissions. The Eco-schools project and related work co-ordinated by

OCC can be used to promote alternatives to the school run (e.g. life sharing, cycling, walking trains)

The County Council has a target for all schools to have an agreed, up to date Travel Plan by 2010. For the schools in Chipping Norton the current situation is as follows:

- ACE County Nursery – At draft stage of Travel Plan
- St Mary's Primary - Current Travel Plan completed March 07
- Holy Trinity Primary - Current Travel Plan completed March 07
- Chipping Norton School – No Travel Plan to date

Successful Travel Plans will reduce the amount of car commuting to these schools. This in turn will reduce the overall levels of congestion and traffic conflicts which appear to play a major part in the development of the Air Quality Problem in the town. These clearly therefore have a role in the overall package of measures to reduce emissions in the town, although this is likely to be small and hard to predict.

Table 7 Supporting measures to proposal 5

Proposal Measure	**Timescale**	**Indicator**
Green Travel Plan promotes local cycle and walking routes and alternative forms of transport to the car to Council staff, councillors and residents of the district.	2009	Surveys will be required to establish whether there is an increased uptake in cycling, walking and alternative forms of transport.
Council commits to working with local employers in Chipping Norton on their own Green Travel plans	2010	Number of green travel plans developed
Initiatives aiming to increase cycling and walking into the town centre and will be part of the Council's Climate Change Communications group's work	2009	Report from Climate Change Communications work Group Evidence of increase in these activities

6.9 Proposal 6

Implementation of county bus strategy
Provision of intelligent timetable information

The bus strategy puts the main bus routes from Chipping Norton to surrounding settlements (Oxford via Woodstock, Charlbury, Banbury, Kingham) as "Second Tier" services for which the target is a frequency of between 30 and 60 minutes. Frequencies on all these routes currently meet the requirements for this level of the Bus Route Hierarchy.

Currently there are plans to upgrade the bus route between Oxford and Chipping Norton during the period 2007-2009. This will involve the enhancement of bus stop poles, flags, shelters, waiting areas, and clearways. The project will form the first phase in the plan to upgrade the route to Premium Route standard. It is intended that real-time information signs will be provided at key stops along the route, and real-time information will be available via SMS and online for the whole route. There will also be some service improvements. Oxfordshire County Council will be working closely with Stagecoach, who is scheduled to replace the current buses with newer models of a higher standard that will be stationed in Chipping Norton.

6.10 Proposal 7

Review and comment the impact of neighbouring local authorities' Local Transport Plans.

This option should be part of routine work as consultation should take place anyway. However it is raised here for inclusion to raise the importance of vetting schemes in other Counties which may have a potential adverse impact within Oxfordshire and the AQMAs. Objection could be raised and heard by the County in question and/or by Defra.

6.11 Proposal 8

Acquisition of powers to require drivers to switch off their engines if they are left idling.

The National Audit Office reported that on the direct effect of emissions testing, research and analysis carried out by the European Commission provided broad estimates of the impact of [the enforcement of] emissions testing and associated vehicle maintenance on emissions levels. This work found a 15% reduction in non-catalyst petrol car's emissions of carbon monoxide and a 5% reduction for catalyst cars. For diesel vehicles the current test reduced emissions of particles comprising both visible and fine particles by 25%. The report also provided estimates of reductions of hydrocarbons and nitrogen oxides. (Enforcement of vehicle emission standards by local authorities – consultation Dept of Transport 2002).

However, caution needs to be exercised in the consideration of the air quality benefits of roadside emission testing. Research into this by the Transport Research Laboratory (Macrae IS, Latham S and Boulter PG (2004). A review of roadside emission testing by local authority in the United Kingdom. TRL report UPR SE/144/04) concluded that roadside emission testing had little impact on air quality and that the test parameters did not correspond to NOx because there are no in service standards. They advised that such measures to be of benefit must be linked to wider public education and centralised publicity campaigns. Such campaigns do however have the ability to improve capture rates for high emitting vehicles.

Powers to issue Fixed Penalty notice to drivers who are stationary, but leaving their engines idling are now available to issue and these could be applied to the air quality management areas. Whilst on its own, it is not a measure that will have much of an impact on air quality, it is a measure that raises awareness and indicates how serious the local authority is taking the matter. The powers could be provided to officers already patrolling the streets such as Parking Patrollers and Police Community Support Officers.

Table 8 Supporting measures to proposal 6

Proposal Measure	**Timescale**	**Indicator**
Review of legislation and identification of officers who require delegated authority for enforcement	December 2008	Report to Director of Environmental Services
Report to Cabinet seeking approval for proposals	February 2009	Report Approval of Scheme Revision of officer delegations

6.12 Proposal 9

Manage parking to reduce traffic congestion and improve air quality

A parking strategy for WODC is required which should be linked to the action plan because of the potential to include in it measures to reduce congestion. Officers have recently began drafting such a strategy which should consist of measures to maximise the existing facilities, promote alternative forms of transport (cycling, footpaths, public transport) and include measures to deter car use for unnecessary journeys. Measures such as public car park charging are contrary to current Council policy, but the feasibility and impact of this should remain under consideration over time. Such schemes may help to reduce congestion in other places, reduce carbon dioxide emissions and help to raise awareness about traffic related air pollution.

Table 9 Supporting measures to proposal 9

Proposal Measures	Timescale	Indicator
Usage Review of all car parks	November 2008	Identification of usage and capacity levels in each car park
Consideration of other development/use opportunities	December 2008	Proposals for commercial or other use of surplus car park land
Review of projected area growth to determine longer term requirements	During the development of the Local Plan.	Full understanding of future car park requirements resulting from population growth and any shopping or other developments
Consider enforcement policy	Summer 2009	Integration of on- and off-street parking management
Consider technology requirements	December 2008	To ensure that most efficient and cost effective methods are used.
Draft Strategy proposals	April 2009	Production of strategic plan
Report to Cabinet	May 2009	Authorisation to implement strategy
Implementation Process	Summer 2009	Successful implementation of agreed strategy

7.0 Table 10 Summary of Oxfordshire County Council Traffic Management Proposals

Proposal	Timescale	Lead Organisation	Cost	Local air quality benefit	Pros / Cons
1 HGV Routing		OCC	Up to £200,000	High Provided 15% HGV reduction is achieved and the scheme is linked with other enforcement measures.	Reduction in congestion Improved safety Increased vehicle mileage therefore CO2 emissions Transfer of noise and pollution elsewhere
• Consultation with neighbouring authorities about route • Decision on route	July 2009				
• Imposition of environmental weight limit and replacement of appropriate signage	December 2009				
• Investigation into integration of Low Emission Zone to support the environmental weight limit	Report by December 2009				
• Development of Enforcement Action Plan	Report by December 2009				
2 Submission of funding bid for regional prioritisation. Funding for a more significant scheme to be considered further in the Transport Networks Review if proposal 1 does not deliver the necessary air quality benefits.	To review in 2010 in light of air pollution monitoring results. Implementation only possible post 2020	OCC	Very High	High	Reduction in congestion Improved safety Increased vehicle mileage therefore CO2 emissions Transfer of noise and pollution elsewhere

Table 11 Summary of Supporting Measures

	Action	Timescales	Lead Organisation	Cost	Local air quality benefit	Pros / Cons
3	Continuously Monitor nitrogen dioxide air pollution in Chipping Norton, reporting annually	Ongoing	WODC	£3000 per year	No direct benefit	Provides essential information on the progress of improvement None
4	Establish steering group made up of officers, elected members and members of the public to monitor the progress of the action plan	To commence in Dec 08	WODC	Low	N/A	Ensures accountability for the action plan
5	Development of Climate Change Policy by reference to and incorporation of the AQ Action Plan to include strategies aimed at reduction of car usage into the town centre	Ongoing	WODC Environmental Policy	Low	Not quantifiable	Maintains profile of action plan work Promotes work across Council sections Reduces the possibility of actions to improve local air quality conflicting with the aims of the climate change strategy. None
5a	Lobbying and support of Government to create policy to increase the use of cleaner vehicles and fuels.	Ongoing	WODC Environmental Policy	Low	Not quantifiable	Increases profile of green transport and fuel Promotes research and development Will take a long time to implement The success is difficult to predict
5b	Engage with local public transport operators (buses and taxis) to a) promote the procurement of vehicles with cleaner engine technologies and b) promote the use of cleaner fuels.	July 09	OCC WODC	Low	Not quantifiable	Lowers emissions Increases profile of green transport and fuel Promotes research and development Only likely to have an impact when linked to profitability/financial incentive The impact and success not measurable at this stage – success is therefore difficult to predict
5c	Engage with freight transport operators to a) promote the procurement of vehicles with cleaner engine technologies and b) promote the use of cleaner fuels.	July 09	OCC WODC	Low	Not quantifiable	Lowers emissions Increases profile of green transport and fuel Promotes research and development No powers for WODC to require action Only likely to have an impact when linked to profitability/financial incentives Will take a long time to implement The impact and success not measurable at this stage – success is therefore difficult to predict

	Action	Timescales	Lead Organisation	Cost	Local air quality benefit	Pros Cons
5d	WODC and OCC to support "Leave your car at home" initiative.	Annually	WODC Environmental Policy Environmental Protection	Low	Not quantifiable	Increases profile of green transport and fuel Increased profile of alterative transport The success is difficult to predict
5e	Promotion of the Use of the Cycle	Ongoing and integral to 5d and 5f	WODC Environmental Policy	Low	Not quantifiable	Vehicle reduction Encouragement for people to exercise No powers to require cycle routes Uptake difficult to predict - Air quality improvements difficult to predict
5f	Development of School Travel Plans and promotion of WODC Green Travel Plan	Ongoing	WODC OCC	Low	Not quantifiable	Encourage walking/cycling/public transport to reduce emissions. Requires commitment from local schools Success will depend on availability of alternatives Success difficult therefore to predict.
6	Implementation of county bus strategy Provision of intelligent timetable information	2016	OCC and transport providers	Low	Not quantifiable	Increased profile of public transport options Real-time information of benefit to the public No powers for WODC to require action Success is difficult to predict
7	Review and comment on the impact of neighbouring local authorities' Local Transport Plans.	As draft LTPs are published	OCC WODC	Low	Not quantifiable	Identifies whether neighbouring transport routing measures could have an adverse impact on the AQMA'S Limited scope to influence other LTP'S
8	Acquisition of powers to require drivers to switch off their engines if they are left idling.	March 09	WODC	Medium	Low	Raises profile Cost to enforce Cost to motorist if fined
9	Manage parking to reduce traffic congestion and improve air quality	October 2008 to July 2009	WODC	Low	Not quantifiable	Lowers emissions Reduced congestion and emissions during key periods Success will depend on availability of alternatives.

8.0 Conclusion

8.1 This action plan provides a range of measures mainly concerned with the reduction of HGV movements though Chipping Norton with other measures associated with the overall reduction of car usage in the area. The monitoring of nitrogen dioxide in Chipping Norton will continue which will serve as an indicator of the success of the action plan. The implementation of the plan needs to be monitored carefully via the steering group and climate change group and modified as supporting strategies to the plan are developed. The success or otherwise of the HGV reduction proposal will determine whether it is necessary to look again at the bypass proposals.

8.2 The success of the action plan is difficult to predict because the proposals depend upon successful agreements with neighbouring local authorities, the cooperation and support of business and the public, the ability to enforce certain aspects of the plan and the impact of national measures regarding transport and environmental policy. It is vital that the plan, as well as being integrated into the Local Transport Plan, be kept current and its profile maintained within the development and implementation of the Climate Change and Sustainable Communities ("Shaping Futures") Strategies to ensure they are complimentary and supportive of each other. The plan must be considered as part of a wider agenda of carbon reduction, sustainable development and the improvement of air quality.

8.3 References

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5 Wikipedia, 2007. *Nitrogen Dioxide*. [Online]. Wikipedia.
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6 Air Quality Expert Group. Nitrogen dioxide in the United Kingdom. Defra Publications 2004

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Department of Health Advisory Group on the Medical Aspects of Air Pollution Episodes. Oxides of Nitrogen - Third Report. HMSO, 1993.

NETCEN, National Air Quality Archive, http://www.airquality.co.uk/

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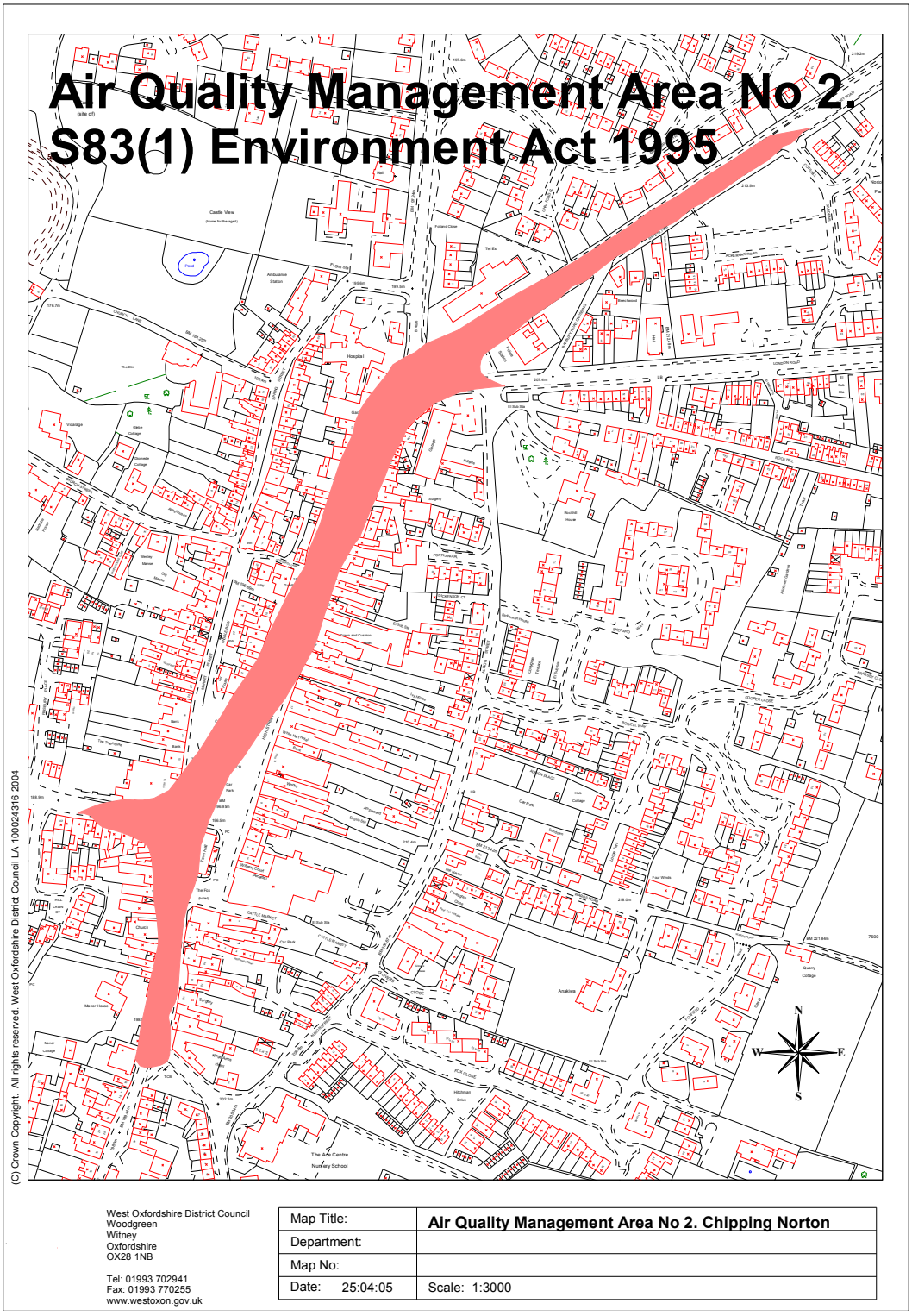
Appendix I

1.0 The Air Quality Management Area



West Oxfordshire District Council
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www.westoxon.gov.uk

Map Title:	**Air Quality Management Area No 2. Chipping Norton**
Department:	
Map No:	
Date: 25:04:05	Scale: 1:3000

Appendix 2

Chipping Norton Draft Air Quality Action Plan Consultation

West Oxfordshire District Council would like to thank you for taking the time to complete this questionnaire. The views and opinions of our stakeholders are important for the development of the Air Quality Action Plan. Please complete the following questions as accurately as possible.

Q1 Please indicate the age category within which you fall.

<25.....☐ 25 - 40……☐ 41 – 50…….☐ 51 – 65…….☐ 65 + ……..☐

Q2A Do you live in West Oxfordshire?

Yes.....☐ No.....☐

Q2B Do you live within the postal area covered by OX7?

Yes.....☐ No.....☐

Q3A Do you in or commute through Chipping Norton?

Yes.....☐ No.....☐

Q3B If so, how many week days (Monday – Friday) on average do you commute?

Monday.....☐ Tuesday……☐ Wednesday….☐ Thursday….☐ Friday…..….☐

Q3C Please indicate the usual time of commuting?

Before 7:00.....☐ 7:00-9:00……☐ 9:00-16:00…...☐ 16:00-18:00….☐ After 18:00..….☐

Q3D Please indicate your usual method of travel?

Foot.....☐ Bicycle……☐ Bus…...☐ Car….☐ LGV…….☐ HGV.……...☐

Q3E Please indicate the approximate distance travelled to Chipping Norton?

<3 miles.....☐ 4 – 25 miles.....…….....☐ 25+ miles ……..……☐

Q4A Do you visit or travel through Chipping Norton other than for work?

Yes..... ☐ No..... ☐

Q4B If so, how many week days (Monday – Friday) on average do you visit?

Monday..... ☐ Tuesday…… ☐ Wednesday…. ☐ Thursday……. ☐ Friday..……..... ☐

Q4C Please indicate the time you usually visit?

Before 7:00..... ☐ 7:00-9:00…… ☐ 9:00-16:00…... ☐ 16:00-18:00…. ☐ After 18:00…...… ☐

Q4D Please indicate your usual method of travel

Foot..... ☐ Bicycle……. ☐ Bus…... ☐ Car…... ☐ LGV…… ☐ HGV..……..... ☐

Q4E Please indicate the approximate distance travelled to Chipping Norton?

<3 miles..... ☐ 4 – 25 miles.....….... ☐ 25+ miles ……..……. ☐

Q5 Do you own a business within Chipping Norton?

Yes..... ☐ No..... ☐

Q6 What do you perceive to be the main source of air pollution in Chipping Norton?

Traffic..... ☐ Industry.....….... ☐ Agriculture…… ☐ Other ……..……. ☐

Q7 Of the 13 proposals presented below, please select 5, which you think will have the greatest effect in reducing the source of pollution selected in question 6.

Gating Scheme.....	☐	Signing scheme diversion.....	☐
Cross Hands diversion.....	☐	Lobbying Government….....	☐
'Leave your car at home'.....	☐	Promotes cycle usage….....	☐
County bus strategy.....	☐	Neighbouring counties local transport plans.....	☐
Force drivers to switch off idling engines	☐	Engage local bus and taxi companies.....	☐
Engage with freight operators.....	☐	Promote school and green travel plans.....	☐
Manage parking…….....	☐		

Q8 Do you think any of these proposals will have positive or negative effects on Chipping Norton other than improving air quality, if so please state what effect(s).

Q9 Do you think any of these proposals in question 7 would have a positive or negative impact on you personally, if so please comment.

Q10 Of the 15 options rejected for further appraisal, (see reverse of page 4) which one of these options, if any, do you think should have been accepted as a proposal?

Q11 Do you have any further comments?

Q12 West Oxfordshire District Council would like to consult further with stakeholders in relation to the Air Quality Action Plan, would you be prepared to participate in further studies?

Yes..... ☐ No..... ☐

If so please complete the following details to enable us to contact you:

Name:

Contact telephone number:

Contact email address:

Options not carried forward as proposals

Option 1:	Bypass
Option 2:	One way gyratory system
Option 4:	Road user charging
Option 6:	Traffic hierarchy change, establish bus and cycle lanes
Option 7:	Access control and clear zones
Option 8:	Low emission zones
Option 9:	Compulsory purchase
Option 11:	Lobbying Government for greener public transport
Option 18:	Commercial workplace charging schemes
Option 19:	Restricting town centre delivery times
Option 21:	Review WODC's fleet emissions
Option 22:	Employee initiatives for greener vehicles
Option 24:	Promotion of WODC staff green travel plan
Option 25:	Increase vehicle emissions testing
Option 26:	Implement powers for vehicle emission testing

Please send your completed questionnaire by 31 March 2008 to:

Community Services
West Oxfordshire District Council
Woodgreen
Witney
Oxon
OX28 1NB

Appendix 3

Faber Maunsell modelling assessment of the traffic management options