LOCAL AIR QUALITY MANAGEMENT

AIR QUALITY ACTION PLAN

Part IV of the Environment Act 1995

Prepared by:

Adur District Council

July 2007

with assistance from the

Sussex Air Quality Steering Group

CONTENTS

1. SUMMARY

Part IV of the Environment Act 1995 requires local authorities to review and assess local air quality. Section 84(1) of the Act requires an authority which has designated an air quality management area (AQMA) to undertake a further assessment, Stage 4, of air quality within the AQMA.

Adur District Council's last Local Air Quality Review and Assessment was completed in December 2004. It highlighted two areas where the annual mean objective for nitrogen dioxide was predicted to be exceeded in 2005. In December 2005, two areas, namely High Street, Shoreham-by-Sea and Old Shoreham Road, Southwick were designated Air Quality Management Areas.

This Stage 4 Report has been undertaken having regard to the guidance produced by the Department for Environment, Food and Rural Affairs (DEFRA). This guidance highlights the main purpose of the further assessment as enabling authorities to:

- to confirm their original assessment of air quality against the prescribed objectives, and thus to ensure that they were right to designate the AQMA in the first place;
- to calculate more accurately how much of an improvement in air quality would be needed to deliver the air quality objectives within the AQMA;
- to refine their knowledge of the sources of pollution so that air quality action plans can be properly targeted;
- to take account of national policy developments which may come to light after the AQMA declaration;
- to take account as far as possible of any local policy developments which are likely to affect air quality by the relevant date, and which were not fully factored into earlier calculations. These might include, for example, the implications of any new transport schemes that are likely to be implemented in the vicinity of the AQMA, or of any new major housing or commercial developments that are likely to be built by the relevant date;
- to carry out real-time monitoring where this has not been done as part of the stage1-3 reviews and assessments;
- to carry out further monitoring in problem areas to check earlier findings;
- to corroborate other assumptions on which the designation of the AQMA has been based, and to check that the original designation is still valid, and does not need amending in any way;
- to respond to any comments made by statutory consultees in respect of authorities' stage1-3 reports, particularly where these have highlighted that insufficient attention has been paid to, e.g. the validation of modelled data.

An additional 12-months of diffusion tube data has been obtained, including additional tubes placed within the AQMAs. Additional dispersion modelling has been undertaken using actual meteorological and traffic data to validate the assessment.

This further assessment confirms the previous findings that the air quality objective for annual mean nitrogen dioxide will be exceeded at High street, Shoreham-by-Sea and Old Shoreham Road, Southwick.

2. Introduction

2.1. Under the Environment Act 1995, local authorities are required to Review and Assess (R&A) air quality on a regular basis. A *review* of air quality means a consideration of the levels of pollutants in the air for which objectives are prescribed in Regulations[1], and estimations of likely future levels. An *assessment* of air quality is the consideration of whether estimated levels for the relevant future period are likely to exceed the levels set in the objectives.

2.2. The first review and assessment round was completed in 1999. The main conclusion was that the national air quality objectives were not likely to be exceeded at any locations in the Adur District. This first round of R&A constituted a benchmark against which Adur District Council could measure future progress in making improvements to the local air quality.

2.3. New guidance issued by the Department for Environment, Food and Rural Affairs (DEFRA) then introduced a schedule of regular **Review & Assessments**, **Updating & Screening Assessments** (USA), **Detailed Assessments** (DA) and **Progress Reports** (PR) so that local authorities continued to consider air quality consistently, rather than sporadically.

2.4. Following the 2003 USA, there was evidence that the specific objectives for nitrogen dioxide (NO_2) could be exceeded at several locations with relevant exposure. The subsequent DA determined that the NO_2 air quality objective (AQO) would be breached in the High Street, Shoreham-by-Sea and the Old Shoreham Road, Southwick. As required, Adur District Council declared two Air Quality Management Areas (AQMAs), which came into force on 1 December 2005. The AQMAs are shown in Figures 1 & 2 below:

2.5. In addition, the Council is required to produce an **Air Quality Action Plan** (AQAP). This must detail the steps to be taken to improve the air quality within the AQMAs. The document should set out specific options that can be implemented within given timescales in order to reduce the annual mean level at the façade of buildings with relevant exposure to below the Government AQO of 40 μm^{-3}.

2.6. The present annual mean values for NO_2 obtained for the High Street, Shoreham-by-Sea and the Old Shoreham Road, Southwick are 43.3 μm^{-3} and 46.3 μm^{-3} respectively. There is no exceedence of the hourly objective of 200 μm^{-3} (18 exceedences a year) in either area.

2.7. The cause of the air quality exceedences in the two AQMAs has been attributed to the road traffic in those areas. No significant contributions from industrial or point sources were identified in the District. The options investigated will therefore focus on those that will target traffic levels and emissions, rather than point sources.

2.8. The Council has considered the overall sustainability of each option available so as to assess not only its ability to alleviate air pollution problems, but also its potential

[1] Air Quality Regulations for England (2000; Amendment Regulations 2002)

economic and social impact. In particular, direct and indirect effects, either negative or positive, have been assessed in order to quantify the costs of each option.

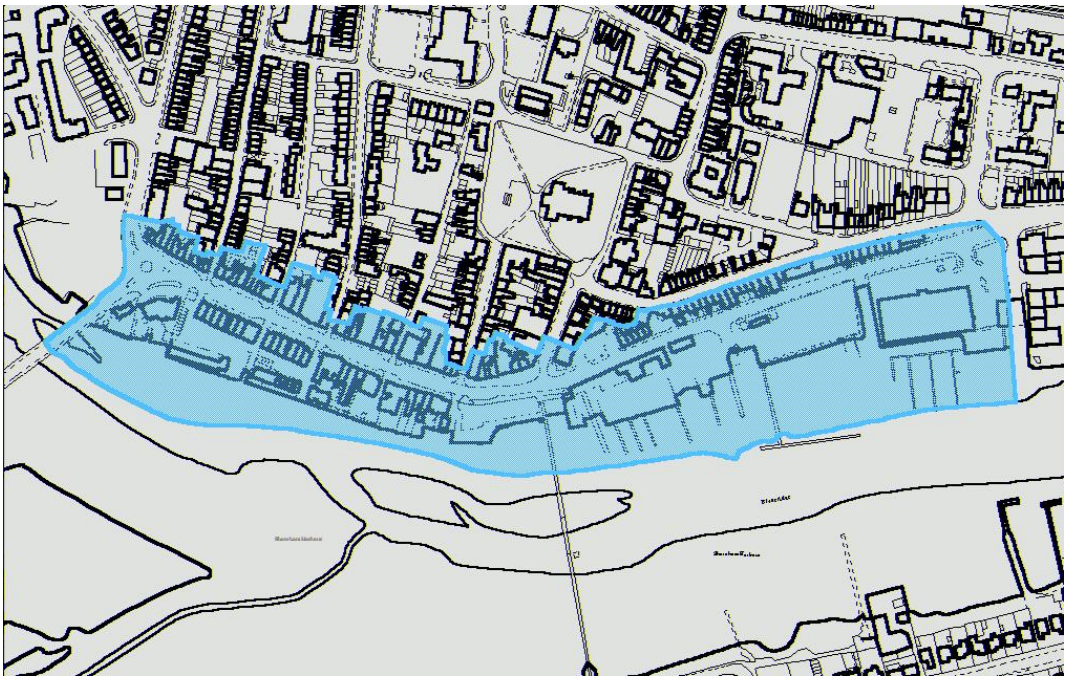


Figure 1 AQMA High Street, Shoreham-by-Sea

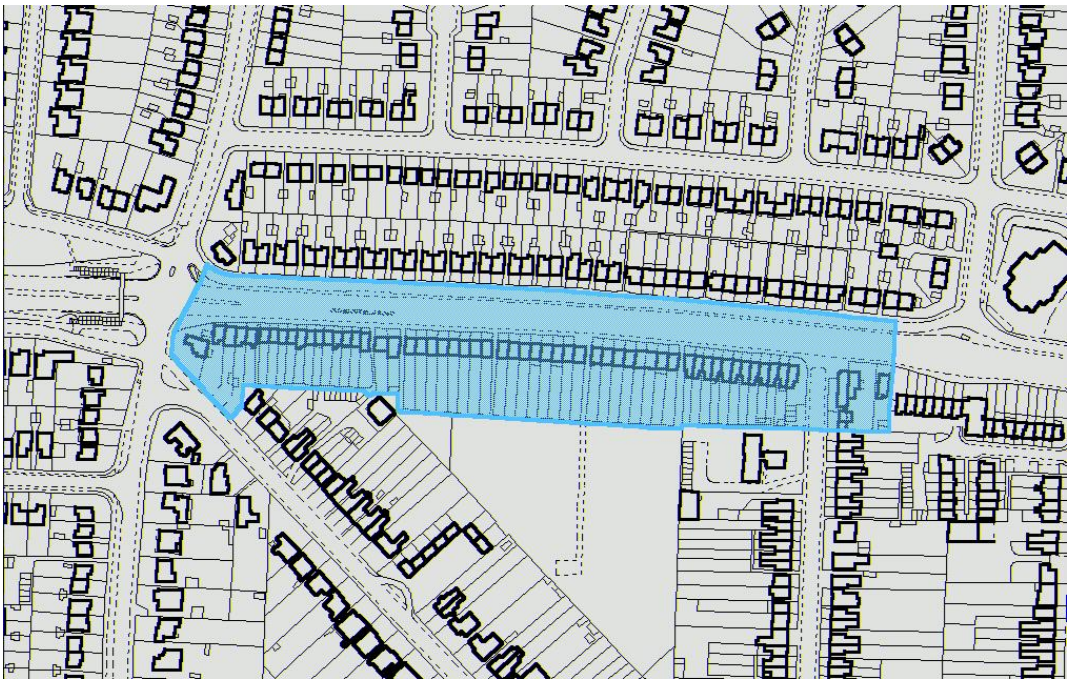


Figure 2 AQMA Old Shoreham Road, Southwick

3. Information about Adur District Council

3.1. Adur District is one of the smallest local authorities in England with a population of approximately 60,000, concentrated mainly in the coastal towns of Lancing, Shoreham-by-Sea and Southwick. The total area is just over 4,200 hectares. The authority derives its name from the River Adur, which divides the District. It is an area of contrasts; it lies between an open coastline and undulating downland. Adur covers an area, which stretches inland from the Sussex Coast to the South Downs, and extends from the border with Worthing in the west to the boundary with Brighton & Hove in the east.

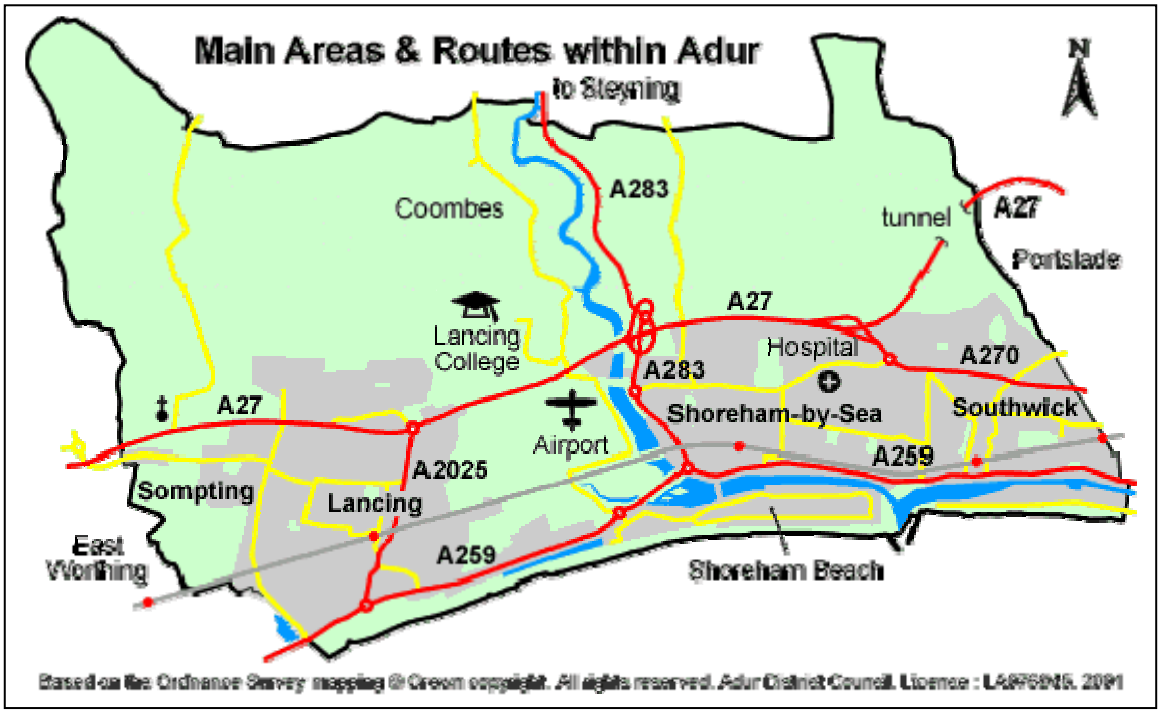
3.2. The district is crossed by the A27 and the A259, which convey a considerable volume of traffic, with the A27 being part of a strategic trunk road linking Honiton in Devon to Dover in Kent. In this district, these roads run past a significant number of homes.

3.3. Along much of the coast, particularly adjacent to Shoreham Harbour, there is a substantial area of industrial land, predominately light manufacturing. Similarly, in Lancing there is a relatively large industrial estate, which is predominately light manufacturing. Shoreham Harbour serves the south coast area, where the Port mainly handles aggregates, timber, grain and scrap metal. There are two fuel terminals and a number of local fishing vessels. There are approximately 1000 ship movements recorded annually.

3.4. Over half the area is in the South Downs Area of Outstanding Natural Beauty. The picturesque charm of old flintstone buildings, farmhouses and winding streets survive amidst the built-up residential and industrial areas, with a thriving port and a small airport.

Map 1 shows the Adur District boundaries and major urban and rural centres.

Map 1.



4. Action Plan Options

4.1. There follows an overview of the options available to improve air quality in Shoreham-by-Sea and Southwick. The responsibility for each of these lies with various bodies, but the implementation of each can be influenced by the District Council. Some of the options are new ventures not yet commenced, while others may already be underway.

4.2. The improvements to air quality (and therefore health) are the principal effects of each option; therefore only the non-air quality impacts have been included in this summary.

KEY:

WSCC - West Sussex County Council
PCT - West Sussex Primary Care Trust

Short term - Commencing within this financial year (or already underway)
Medium term - within 5 years
Long term - 5 – 10 years

Low cost – No cost to low £ hundreds, or already committed
Medium cost - £ hundreds to low £ thousands
High cost - £ thousands upwards

Table 1. Action Plan Options					
Option	**Area**	**Lead role**	**Impact**	**Cost**	**Timescale**
Traffic management					
Engineering works to reduce stop/start	High St.	WSCC	Smoothes/reduces traffic flow Reduces congestion & noise Improves safety Moderate AQ impact Expensive	High	Long term
Traffic Light & pelican crossing optimisation	A270 & High St.	WSCC	High AQ impact Smoothes traffic Reduces congestion Must take account of disabled and vulnerable persons	None	Short term
MOVA or SCOOT traffic control (reacts to real time traffic demands	A270 & High St.	WSCC	High AQ impact Smoothes traffic Reduces congestion	Medium	Medium term
New direction signing	A270 & High St.	WSCC Highways	Moderate AQ impact Maximises existing road network capacity	Low	Short term
HGV direction signing	A270 & High St.	WSCC Highways	Moderate AQ impact Can be done as part of local lorry strategy	Low	Medium term
Speed limit changes	A270 & High St.	WSCC	Moderate AQ impact Improves road safety	Low	Medium term
Moving existing bus stops	A270 & High St.	WSCC	Moderate AQ impact May conflict with increasing bus frequency and modal shift	Medium	Medium Term
Engineering Works					
“Pollution-eating” pavements	A270 & High St.	WSCC	Moderate/High AQ impact High capital cost Must fit in with existing replacement programme	High	Long term
A259 Strategy					
Minor engineering measures and bus infrastructure including ‘green light’	A270	WSCC	High AQ impact	Medium	Medium term

Public Transport					
Bus: Coastal fastway (infrastructure changes & improvements, frequency, etc). Ensure cleaner vehicles used, modal shift/"Smart Choices"	A270 & High St. -mostly High St.	Bus Quality Partnership	High AQ impact Improves public transport Encourages modal shift	Already allocated	Short term
Cleaner taxis	A270 & High St.	Adur DC	Moderate/Low AQ impact Improves industry image	Low	Medium term
Rail – See Travelwise	A270 & High St.	Southern WSCC	Low AQ impact , but scope to improve Reduces congestion & emissions in wider area outside AQMAs	Low	Short term
School Travel Plans					
Prioritising implementation of these and safer routes to schools plans in schools surrounding or within AQMA	A270 & High St.	WSCC	High AQ impact Improves child health & safety Teaches travel awareness & counts as part of curriculum Reduces congestion	Low	Short term
"Planning Adur Schools for the Future					
Adjusting school populations in a way that will reduce travel	A270 & High St.	WSCC Education Dept.	High AQ impact	Existing budget	Short term
Business Travel Plans					
Green travel plans for: single companies, whole business parks/estates. Car shares	A270 & High St.	WSCC Adur DC (inc. 106 agreements)	Moderate AQ Impact Reduces congestion and emissions in wider area outside AQMA	Low	Medium term
Adur District Council/WSCC travel plans	A270 & High St. –mostly High St.	Adur DC & WSCC	Moderate AQ Impact Reduces congestion and emissions in wider area outside AQMA	Low	Medium term
Southlands Hospital Travel Plan; Transfer of most treatment to Worthing	A270	PCT (with WSCC input)	High AQ impact Reduces air pollution at hospital and pressure on Southlands car park	Low	Medium term

Travelwise transport Awareness					
Encouraging people who regularly drive through the area to consider using other forms of transport	A270 & High St.	WSCC B'ton & Hove Adur DC	Moderate AQ impact, potentially high Will generate increased awareness and reduced car travel across West Sussex and Brighton & Hove. Backs up travel plan work by reaching other sections of the public and encouraging more walking, cycling and public transport use	Low	Medium term
County wide Public car share Database (promoted locally)					
Free Car share service to public plus special groups for local businesses, industrial estates, teachers, hospital staff, local authorities	A270 & High St.	WSCC	Moderate AQ impact Improves accessibility for disadvantaged groups as well Publicity will have impact on the wider area as well	Low	Short term
Parking/Decriminalisation					
Enforce powers optionally available to local authorities in regard to penalties for excessive vehicle engine idling and on vehicle emissions	High St.	WSCC	Low AQ impact, but high awareness value Local enforcement will have an impact on encouraging better vehicle maintenance and hence fewer emissions in wider area as this will target "gross polluters"	Medium	Medium term
Shoreham Controlled parking Zone					
Cheaper clean vehicle parking	High St	WSCC	Low AQ impact initially Encourage purchase of cleaner vehicles	Low	Long term
Off-street parking					
Reduce movements of vehicles "looking" for parking	High St.	Adur DC	Moderate/High AQ impact Reduces congestion Links with CPZ & enforcement regime	Medium	Medium term
Local Information					
AQMA awareness – consider alternative travel routes/options	A270 & High St.	WSCC Adur DC	Backs up Travelwise work Promote awareness of transport alternatives	Low	Short term

Variable Message System (VMS)	High Street	WSCC	Provides real-time information on pollution levels Encourage alternative transport use Possible adverse visual impact	Medium	Medium term
Land Use Planning					
Structure plan	A270 & High St.	Adur DC WSCC	High AQ impact, but potentially negative if AQ issues overruled Encourage more sustainable development proposals	Low	Medium term
Representations on individual proposed developments	A270 & High St.	Adur DC WSCC	High AQ impact, but potentially negative if AQ issues overruled s.106 agreements provide funding for AQ initiatives	Low	Short term
On-going monitoring of traffic and air pollutants					
Use for publicity and to monitor progress	A270 & High St.	WSCC Adur DC	Essential, but may have positive impact Backs up Travelwise work Will help focus on best action plan/strategy elements or in modifying these	Medium	Short term
Congestion Charges					
Charge for vehicles using Norfolk Bridge	High St.	WSCC Adur DC	High AQ impact Encourage use of alternative routes to AQMA Generate income for AQ, climate change and general pollution work Negative impact on local economy	High	Long term

5. 2005 Detailed Assessment

Summary of work completed for Review and Assessment

5.1. The initial review and assessment of air quality required by the Government was specific to seven pollutants as noted in section 2 above. The 2003 USA concluded that nitrogen dioxide and particulate levels may be of concern. The Detailed Assessment (DA) completed in 2005 took a closer look at those areas that were identified in the Updating & Screening Assessment (USA) as requiring further assessment. To achieve this, all the available monitoring data on traffic flows, pollution monitoring and the last 5 years 1-hour average weather data was assessed. Additional data was collected as required.

5.2. Following on from the USA, which used simple air quality screening forecasting models, the Detailed Assessment used a more advanced forecasting model, namely 'Breeze Roads' and 'Breeze Aeormod'. The models forecasted NO_2 against the 2005 objective and PM_{10} against the 2004 and (provisional) 2010 objective.

5.3. In all the areas modelled, 'discrete receptors' were used to mark the locations where the general public (non-occupational) was identified as likely to be present for the respective pollutant exposure period. Five years worth of weather data was modelled to help provide the worst case scenario. The modelling results were subjected to the verification correction factor and the ambient background pollutant value added. The result is the modelled value at the receptor location.

5.4. The Detailed Assessment was not based on modelling results alone. To predict pollution levels at a future date, monitoring results were also considered as they provided an indication of actual pollution levels.

5.5. Diffusion tube monitoring has its errors so to minimise these, a bias-adjustment factor was applied to the results, using the average value of co-location studies conducted nationally. Since monitoring results cannot immediately state what the pollution levels will be at a future date, the actual levels were projected forward, following the methodology stated in the Technical Guidance notes [LAQM, TG03]. The results indicate whether the pollutant objective will be met, or not.

Detailed Assessment Results

<u>Particulate matter</u>

5.6. Limited monitoring, for indicative purposes only, was carried out for PM_{10} at 121-123 Gardner Road, Southwick. This site is downwind of the aggregate stockpiles located east of Shoreham power station. The monitoring was carried out over a one month period between 14 March- 16 April 2004, with readings being taken every 15-minutes.

5.7. The adjusted monthly reading was 28.7 µg m^{-3}. This is only 72% of the 40 µg m^{-3} 2004 AQO for PM_{10}, but exceeds the 20 µg m^{-3} 2010 provisional AQO.

5.8. From this indicative reading, it was considered unlikely that the 40 µg m^{-3} 2004 AQO for PM_{10} will be exceeded. The 20 µg m^{-3} 2010 provisional AQO may be exceeded

but by this time it was expected that the permitted peat treatment plant will be operational and the stockpiles relocated.

5.9. The PM_{10} Particulate modelling forecasts that the provisional 2010 annual PM_{10} AQO will be met at all locations.

5.10. There was no need therefore for an AQMA in respect of PM_{10}.

Nitrogen Dioxide

5.11. Adur District Council presently only carries out passive monitoring within the District. The passive monitoring involves NO_2 diffusion tubes at numerous locations around the Adur District. The NO_2 diffusion tubes provide valuable information at relatively low cost. The Updating & Screening Assessment determined the need of a detailed assessment of NO_2 based on the results from this type of monitoring. The projected NO_2 diffusion tube monitoring results from the years 2001, 2002 & 2003 are shown in Appendix I. These results are subjected to the bias adjustment factor of 0.78, 0.84 and 0.85, respectively. 'Air Quality Consultants Ltd' based at the University of West of England (UWE), gathered together the various UK collocation study results and from these calculated the mean annual values, to arrive at these factors.

5.12. Several locations showed predicted exceedences of the 40µgm^3 AQO annual level for NO_2 but, following the application of kerbside correction factors, only two locations still projected an exceedence of the annual NO_2 AQO. The results are shown in Table , below.

Table 2 - The corrected NO_2 results at selected residential facades.

NO_2 Tube location	Result 2005 (µgm^3)	Distance from kerb to façade. (m)	Correction factor (f)	Corrected result at façade 2005 (µgm^3)
High Street, Shoreham-by-Sea	46.8	5-10	0.90	42.1
Old Shoreham Road, S'wick	48.6	2-5	0.95	46.2
Boundstone Lane, Lancing	46.5	10-20	0.75	34.9
Manor Road, Lancing	42.6	10-20	0.75	32.0

5.13. Air Quality modelling was undertaken for locations where the previous USA modelling and monitoring suggested there would be exceedences of the Air Quality Objectives for future years. The locations were broken down into road sections as follows:

Junctions regarding NO_2 (2005)
Single Roads regarding NO_2 (2005)
Junctions regarding PM_{10} (2004)
Junctions regarding PM_{10} (2010)
Single Roads regarding PM_{10} (2004)
Single Roads regarding PM_{10} (2010)

5.14. The results from modelling the 2005 NO_2 AQO showed that every area was expected to meet the respective air quality objective, except the High Street, Shoreham-by-Sea and the Old Shoreham Road, Southwick.

5.15. AQMAs in respect of nitrogen dioxide were therefore declared, effective from 1 December 2005, for these two areas as shown in Figures 1 & 2, above.

"Stage 4" Assessments - overview

5.16. As the 1995 Act states, the main purpose of the further assessment is to allow local authorities an opportunity to supplement the information they have already gathered from their earlier review and assessment work. The further assessment should provide the technical justification for the measures an authority includes in its action plan. It allows authorities:

- to confirm their original assessment of air quality against the prescribed objectives, and thus to ensure that they were right to designate the AQMA in the first place;
- to calculate more accurately how much of an improvement in air quality would be needed to deliver the air quality objectives within the AQMA;
- to refine their knowledge of the sources of pollution so that air quality action plans can be properly targeted;
- to take account of national policy developments which may come to light after the AQMA declaration;
- to take account as far as possible of any local policy developments which are likely to affect air quality by the relevant date, and which were not fully factored into earlier calculations. These might include, for example, the implications of any new transport schemes that are likely to be implemented in the vicinity of the AQMA, or of any new major housing or commercial developments that are likely to be built by the relevant date;
- to carry out real-time monitoring where this has not been done as part of the stage1-3 reviews and assessments;
- to carry out further monitoring in problem areas to check earlier findings;
- to corroborate other assumptions on which the designation of the AQMA has been based, and to check that the original designation is still valid, and does not need amending in any way;
- to respond to any comments made by statutory consultees in respect of authorities' stage1-3 reports, particularly where these have highlighted that insufficient attention has been paid e.g. to the validation of modelled data.

National Policy Developments

5.17. In April 2006, the Department for the Environment, Food and Rural Affairs (DEFRA) issued a consultation document on Options for further improvements in air quality. The consultation closed on 11 July 2006. No new policy developments have been introduced since the declaration of the AQMAs.

Additional Monitoring

5.18. In May 2007, DEFRA awarded Adur District Council a grant to purchase a StreetNox Air Quality Monitoring Station to monitor NO_x and NO_2 levels in the High Street AQMA. The station is, however, still awaiting commissioning and so no real-time measurements of pollution levels have been possible. It is anticipated that the data will be available from September 2007.

5.19. Adur District Council has continued to monitor NO_2 levels through the diffusion tube network, including additional tubes placed within the two AQMAs. The following table shows the bias-adjusted results for each of the locations. The rows highlighted in yellow are located within the AQMAs.

Table 3 Bias-adjusted nitrogen dioxide levels

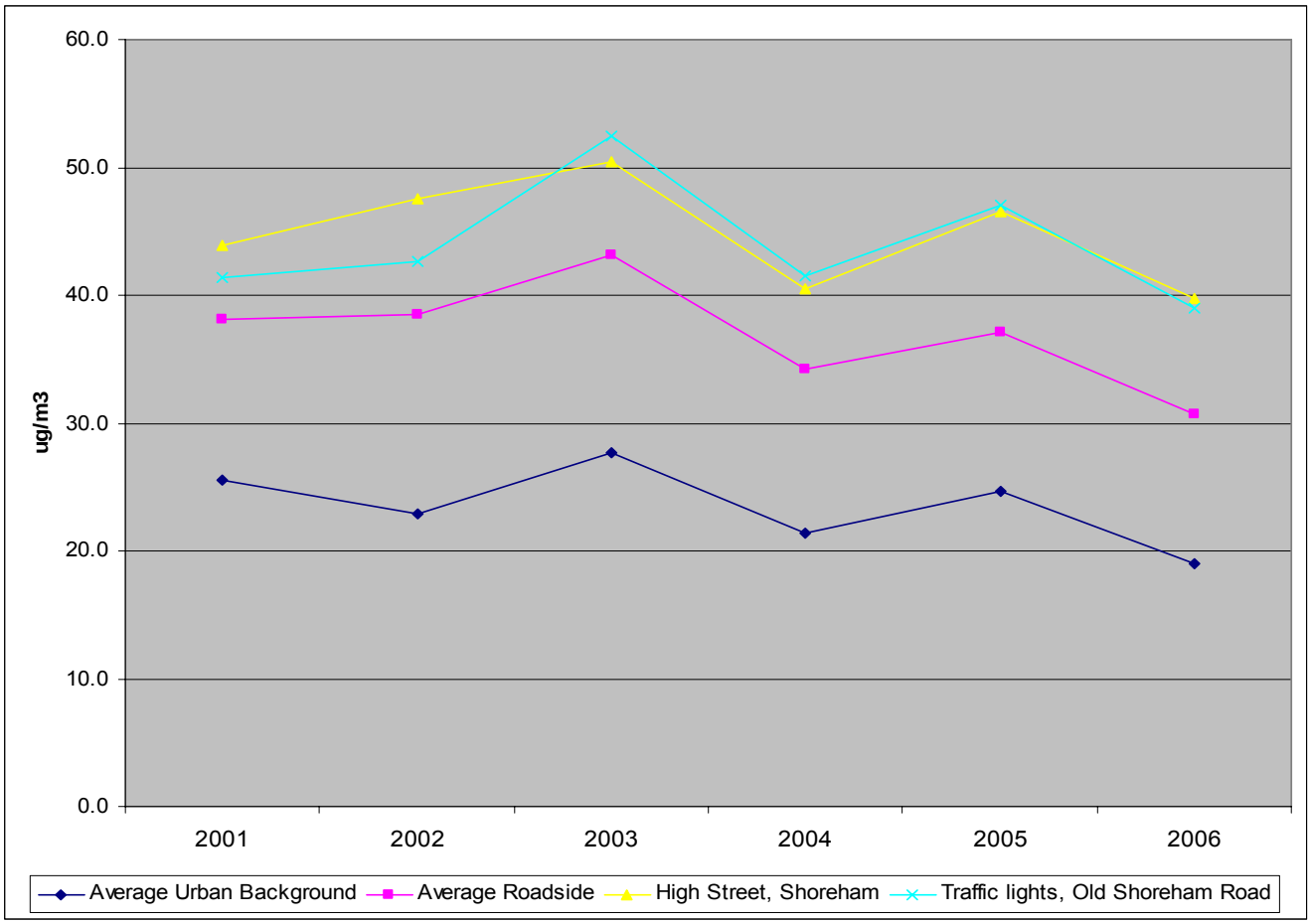
NO_2 Tube Location (Bias adjusted)	**2001** ($\mu g/m^3$)	**2002** ($\mu g/m^3$)	**2003** ($\mu g/m^3$)	**2004** ($\mu g/m^3$)	**2005** ($\mu g/m^3$)	**2006** ($\mu g/m^3$)
Kings Road, Lancing	24.1	23.4	27.1	21.4	24.2	18.9
John Street, Shoreham	28.2					
High Street, Shoreham	43.9	47.6	50.5	40.5	46.6	39.7
Pond Road, Shoreham	22.2	22.4	26.6	19.5	23.4	17.6
Traffic Lights, Old Shoreham Rd	41.4	42.7	52.5	41.5	47.1	39.0
Old Shoreham Road, Southwick	31.3					
Lower Drive, Southwick	25.0					
Queens Road, Southwick	22.2	21.2	25.6	19.3	22.4	17.3
Boundstone Lane, Lancing	39.5	41.1	50.2	39.2	41.2	33.9
West Street, Sompting	24.7	23.8	29.4	23.1	25.4	19.5
Western Road, Lancing	36.8	35.8	36.5	29.8	33.9	31.4
St Aubyns Crescent, Southwick	26.2	23.9	29.8	23.8	27.8	21.8
Hove Town Hall	37.0	35.3		34.9	37.9	31.9
Lancing Manor Road			46.0	39.9	40.9	37.4
Holmbush Roundabout			41.1	31.2	36.8	26.2
Old Mill Close, Southwick			41.8	30.8	34.8	26.8
Underdown Road, Southwick					44.9	36.9
Southwick Street, Southwick					34.8	28.9

The Table below shows the estimated annual average NO_2 concentrations for 2010 from measured roadside concentrations within the AQMAs

Table 4 Projected 2010 nitrogen dioxide levels by year

NO_2 Tube Location	2001	2002	2003	2004	2005	2006
(Bias adjusted)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
High Street, Shoreham	32.2	36.1	39.4	32.4	38.3	33.7
Traffic Lights, Old Shoreham Rd	30.3	32.3	40.9	33.3	38.7	33.2
Underdown Road, Southwick					36.9	31.3

The graph below shows the annual variation in the levels of nitrogen dioxide.



5.20. The graph demonstrates the contribution made by the traffic flow in the two AQMAs, but also shows the effect of the meteorological conditions in the years in question. Although linear regression analysis shows that the NO2 levels are dropping, there is a much slower decrease within the two AQMAs. The figures for 2006 are only just below the AQO and weather conditions, as well as variation within the bias-adjustment for the diffusion tubes may well result in an increase in 2007.

Additional Modelling

5.21. Following the declaration of the AQMAs, re-modelling was carried out for 2005 and 2006 using actual 2005 and 2006 meteorological and traffic data to marry up with measured NO_2 concentrations. The 2010 modelled NO_2 was based on 2006 meteorological conditions at Shoreham Airport and projections of traffic growth from West Sussex County Council.

Table 5. Summary of revised modelled NO_2 levels at sensitive receptors

	Baseline Year			Intermediate year	LTP2 final year		
	2005			**2006**	**2010**		
Modelled NO_2 contribution:	Original modelled ($\mu g/m^3$)	Actual remodelled 2005 ($\mu g/m^3$)	*Difference*	Modelled 2006 ($\mu g/m^3$)	Original 2005 projection ($\mu g/m^3$)	2006 projection ($\mu g/m^3$)	*Difference*
From traffic sources							
87a High St. S'ham	16.1	40.8	*60%*	29.0	13.2	25.1	*47%*
NOx tube, High St. S'ham	14.2	28.6	*50%*	21.2	11.7	18.4	*37%*
4 Old S'ham Rd, S'wick	19.7	30.1	*34%*	19.9	14.9	19.1	*20%*
NOx tube, Old S'ham Rd, S'wick	16.8	27.1	*38%*	19.1	12.6	18.2	*31%*
"Total"							
87a High St. S'ham	35.6	60.3	*41%*	47.5	29.8	41.7	*28%*
NOx tube, High St. S'ham	33.7	48.1	*30%*	39.7	28.3	35.0	*19%*
4 Old S'ham Rd, S'wick	40.7	51.1	*20%*	39.8	32.7	36.9	*11%*
NOx tube, Old S'ham Rd, S'wick	37.8	48.1	*22%*	39.0	30.4	36.0	*16%*

5.22. It can be seen from these results that the remodelled figures confirm the elevated levels of NO_2 within the AQMAs. The modelled figures for 2006, using actual transport figures and meteorological data are equivalent to the nitrogen dioxide levels measured by the diffusion tubes. As previously stated these are below the AQO for NO_2, but within the 10% accuracy limit for the model.

5.23. The 2006 modelled projected figures for 2010 (the final year of LTP2) show broadly similar levels to those projected from roadside concentrations (see Table 5 above). The model does however suggest that the AQO may continue to be breached at 87a High Street, despite the measures set out in the LTP2.

Local Policy Developments

5.24. There are a number of developments that have been submitted or decided since the AQMAs were declared.

- Lady Bee Marina Development – A proposed development on the A259 to the east of Shoreham-by-Sea to provide improved marina facilities and commercial and leisure floor space in five stages. This development was refused but an appeal has been lodged. A revised application in respect of Stages 1 & 2 is also expected. Air quality assessments carried out in support of the application show up to a 0.5 $\mu g/m^3$ increase in NO_2 levels within the High Street AQMA due to traffic originating from the development.

- Parcelforce site – A proposed development within the High Street AQMA to provide a 78-bedroom hotel, two shops and 79 flats. Air quality assessments carried out in support of the application shows an increase of between 0.4 – 1.8 μg/m^3 in NO_2 levels within the High Street AQMA due to traffic originating from the development.

- Howard Kent development - A proposed development on the A259 to the east of Shoreham-by-Sea to provide 125 units of accommodation. The developers have been informed that this number of dwellings would be unacceptable on the grounds of overdevelopment. No air quality assessment in support of this scheme has been provided.
- Shoreham Airport development – An application to provide over 13000 sq. ft. of commercial floorspace on the airport directly to the west of Shoreham-by-Sea. Access to the airport will primarily be to the A27 north of Shoreham-by-Sea and so there should be no adverse effect on the AQMAs.

- Southlands Hospital development – a proposed development on the Upper Shoreham Road to the north of Shoreham-by-Sea and directly west of the Old Shoreham Road AQMA to provide 170 units of accommodation. No air quality assessment in support of this scheme has been provided.

- Waste Transfer Station, Lancing Business Park – a new development that has replaced the waste transfer station in Halewick Lane, Sompting. There are no additional road traffic movements associated with this development that will affect existing AQMAs.

- Waste-derived Fuel plant, Lancing Business Park – a development to provide a WDF plant at an existing waste recycling centre. This site will be permitted by the Environment Agency under the Pollution Prevention Control Act 1999. The site has been modelled in respect of NO_2 emissions and will not result in the AQO being exceeded. There are no additional road traffic movements associated with this development that will affect existing AQMAs.

- South East Plan – The South East England Regional Assembly (SEERA) have proposed a strategic housing allocation on Shoreham Harbour land straddling the eastern border between Adur District Council and Brighton & Hove City Council of up to 5000 properties. A development of this magnitude would have major effects on the coastal transport infrastructure and consequently adverse effects on the air quality for the A259, A270 and the A27, all of which have sensitive receptors close to the roadside. Any such development would need to be in conjunction with road, access and transport improvements within the immediate vicinity to mitigate any such effects.

Statutory Consultation

5.25. The Environment Act 1995 provides a statutory basis for consultation and liaison. Consultation has taken place at all stages of the review and assessment process.

5.26. Upon completion of the 2004 Detailed Assessment, Adur District Council carried out a consultation exercise with the following consultees.

- The Secretary of State for the Environment, Food and Rural Affairs
- Highways Agency
- The Environment Agency
- West Sussex County Council
- Neighbouring Local Authorities
- Councillors
- Planning department
- Residents within the two proposed areas for the AQMAs.

5.27. In addition, information was placed within local libraries and on the Council website. A press release resulted in coverage in local papers and radio and comments were invited from the general public.

Responses to the consultation –

General

5.28. One comment was received from a Councillor in respect of the southern boundary of the High Street AQMA, which was explained with reference to DEFRA guidance.

Department for the Environment, Food and Rural Affairs

5.29. DEFRA made the following comments:

5.30. The Report sets out the Detailed Assessment, which forms part of the Review & Assessment process required under the Environment Act 1995 and subsequent Regulations.

- It covers nitrogen dioxide and PM10, and concludes that Air Quality Management Areas will be required for nitrogen dioxide.

- On the basis of the evidence provided by the local authority, the conclusions reached are **accepted for both pollutants**.

- There are concerns about the modeling (see Commentary) and these should be taken into account before determining the AQMA boundaries.

Commentary

- The report is well structured and provides much of the information specified in the Guidance.

- The following specific items are drawn to the local authority's attention to help inform future work:

- It is not clear why two verifications are presented for PM_{10}, giving different adjustment factors, yet only one adjustment factor, the lower, is used. It is also not appropriate to verify the fugitive source model using a roadside site. The

verification should deal only with the road contribution and it should be assumed that the background and fugitive model results are correct.

- It is not clear where the background model data come from or what values were used.

- The model verification for NO_2 has not been carried out correctly. The calculations are on page 54. The NO_2 adjustment factor should be applied to the modeled road contribution on the basis of monitored road contribution, which is given by total NO_2, minus background NO_2 (adjustment factor = modeled road/monitored road). The NO_2 adjustment factor is thus 2.83 in Table 1. Applying this to the NO_2 from the road gives 8.1 µg/m^3 from the road, which plus background gives 33.4, thus the NO_2 adjustment factor is 1.07. (The NO_2 adjustment factor in Table 1 is calculated wrongly even on the basis of total NOx. It should have been Monitored Total / Modeled Total. The average would thus have been 75.5/53.5 = 1.41 not 1.30.) Taking this through to the calculation in Table 3 on page 56 would give 44.5, not 32.3 µg/m^3.

- The model verification for PM_{10} should not use a roadside site, as this does not verify the modeling of the fugitive source. It is also confusing that the PM10 adjustment factor is 1.61 on page 57 and 1.15 on page 61. Which one was applied? Would this make a difference? Fugitive sources are difficult to model, hence the emphasis on monitoring. Was the monitoring at the worst-case relevant location?

5.31. The Project Officer for the Sussex Air Quality Steering Group (SAQSG) made the following response to the DEFRA comments and the report was modified accordingly

  - There is only one verification for PM_{10} (1.61) in Sussex, as there is no other local monitoring correction. I agree that the fugitive should not be corrected using the roadside correction and it is <u>not</u>. The correction is only applied to the roadside contribution. (More details in point 4)

  - Background model data, I presume this means where is the background data from. The background data was sourced from UK NAEI database in your case. If the location of the modeling were in East Sussex and near the coastline we would have used the Eastbourne TEOM (*1.3) data for PM_{10} background data for a specific year.

  - NO_2 verification questions are clarified as follows. UWE commented that the model verification for NO_2 was incorrect in the tables. It appears as though the tables are incorrect and I am reviewing the verification data at present and will be reproducing a model verification table in 2005, which will be updated to include 2004 data. I have re-calculated the NOx > NO_2 calculations for Adur and found that there are no significant differences in concentrations at any receptors

  - Calculations on page 54 relating to NOx adjustment factor: - Agreed with comments.

- The NO_2 adjustment factor: - Agreed with comments.

- The calculation for the average correction factor from 2000 to 2003 for NOx was taken from the average of the all the correction factors (i.e. 1.24, 1.41, 1.25, 1.24 = 1.30), and not the calculation = Avg. Monitored Total/Avg. Modeled Totals (2000—2003).

- Calculations on page 56 relating to final NO_2 result: - Agreed with comments.

  PM_{10} verification:

- The modeling for the fugitive sources did not use the roadside adjustment factor. The adjustment factor was only applied to the roadside contribution only (not to background or fugitive sources).

- The PM_{10} adjustment figure used for roadside contributions (2004) was 1.61.

- Where did the 1.15 verification factor come from? The report I supplied Adur DC with only has the 1.61 adjustment factor - can you clarify where the 1.15 factor is sourced?

- I have run a re-calculation with the 1.15 verification factor and the figures reduce very little. The main source component of the total PM_{10} fraction is in fact the background concentrations (-90% of total annual average 2003).

5.32. No other comments were received, apart from acknowledgements of receipt of the report, but it should be remembered that Adur District Council and West Sussex County Council have worked closely throughout the process.

5.33. Comments have also been received from WSCC in respect of this further assessment and action plan as listed below:

I have a few comments on details, mainly to do with the options (Table 1) and section 6 Summary of Actions to be employed.

Table 1:

Coastal Fastway (now 'Expressway') is a major scheme in the second LTP while measures to improve reliability are included in this the cleanest possible vehicles (and means to achieve this) still need to be negotiated over. (Therefore not all elements of funding are allocated yet).

School Travel Plans in schools in the area: These are already being prioritised so timescale is short term/underway.

Parking/Decriminalisation: 2009 is the likely date for this to come into force. WSCC will need to allow for these powers in any contract with an enforcing body.

Until the new regime comes into force will Adur DC be looking at off street parking, discounts for cleaner vehicles, means to reduce movements of vehicles looking for parking? There are a lot of small car parks adjacent to the A259 (north) which generate traffic movements in the AQMA; can something be done to deal with this?

Land Use Planning: Once the LDF is approved by Govt this will replace the Structure Plan.

Norfolk Bridge Congestion Charges (table 1 and 6.2): Could increase traffic using A283/A259 route and High St. (to avoid tolls) and hence increase emissions in existing AQMA and beyond. Method of toll collection – would be hard to avoid generating large traffic queues even using an electronic pass system and would need additional approach lanes. Overall unlikely to help and more likely to increase existing problems. Discussing the possibility is worthwhile, but really the suggestion would only have a chance of working as part of a larger charging scheme involving the High Street and A283 past Ropetackle or a wider scheme for Shoreham. Costs and practical problems would be considerable, compared with the scale of the air quality problem. Residents of Shoreham Beach would have to pay the tolls to use the A283 to link with the A27 or to travel East (or travel via Lancing).

Local policy developments – Parcelforce site (p18). A new access within the High Street AQMA has been approved. Care with the design to avoid causing traffic queues and funding of AQAP elements is required. Some Section 106 funding may be available. Investigative work is being done on closing East Street; this will have affects on local traffic movements and a bus route. This measure will be in tandem with the development access.

6 - Summary of actions/measures to be employed:

New speed limits have been looked at for High St but now that we have reliable speed data speeds are below 20MPH already for most of the day. VMS (variable message signing linked to traffic command centre) signing as against more fixed signage is proposed after discussion with WSCC signs team on existing signage already implemented to deal with HGV and strategic traffic.

The measures proposed form a pretty comprehensive package, the main threat to achieving reduced emissions and improved air quality is the considerable amount of local development proposed as already noted in the latest Local Transport Plan.

6. Summary of Actions to be employed

6.1. The technical work carried out on the pollution levels within the AQMAs show that the source of the nitrogen dioxide is road traffic. The A259 and, to some extent the A270, form part of an important coastal link between Worthing and Brighton and destinations further afield. The options available to reduce levels of pollution are limited and any strategy must include a range of measures, rather than a single action.

6.2. Some of the options mentioned will not be feasible at this time on the grounds of cost-effectiveness and detriment to the local economy. For example, whilst the introduction of a toll system on the Norfolk Bridge would reduce traffic numbers and congestion, this would necessarily affect passing trade for many of the shops and businesses in the area and, in the short term at least, sterilise any growth in the area.

6.3. The actions to be employed will therefore rely heavily on the WSCC Second Local Transport Plan (LTP2). The results of the modelling carried out in Section 5.0 and Annex 2 show that these measures will result in emission reductions sufficient to meet the AQO.

Measures to be employed include:

- Traffic light & pelican crossing optimisation
- MOVA or SCOOT traffic control
- New signage
- Speed limit changes
- Coastal fastway for buses
- Travelwise transport awareness
- School Travel Plans
- Planning Adur Schools for the Future
- Business Travel Plans
- County-wide Public Car Share database
- Local information
- Increased monitoring of pollution and traffic

6.4. Alongside this the District Council's Domestic & Pollution team will continue to use it's statutory powers to influence planning decisions where air quality issues are involved and make use of Local Authority Pollution Prevention Control in order to regulate the emissions to air from local industry.

6.5. Regular updates on air quality in the area will be produced and made available to the public via the Council's website and the local media.

6.6. It is likely to be more practical and effective at this point principally to utilise those measures already planned or underway. However, should these measures not result in the predicted drop in Nitrogen Dioxide levels, the remaining options will again be reviewed.

6.7. The principal cost of LTP2 will be borne by West Sussex County Council. Work within and by the District Council will be funded by its present budgeting system.

7. Monitoring and Evaluation

7.1. In order to evaluate the effectiveness of the Action Plan the District Council will continue to monitor Nitrogen Dioxide levels with the use of diffusion tubes and a new continuous analyser in the High Street, Shoreham-by-Sea. This will show whether the expected and required reduction in levels is occurring and whether the objective level is likely to be met by 2010. The trend in pollution levels will also be shown by the next stage of Review and Assessment of Air Quality, which make use of any new emission factors and any updated objectives for the pollutants produced by the Government.

7.2. If it appears that the reduction in NO_2 will not be sufficient then this Action Plan will be reviewed and possible further measures revisited and implemented.

7.3. If the WSCC LTP2 proves not to be successful then a complete review may be required. The County Council's evaluation of LTP2 will also be utilised for it's analysis of traffic flows, public transport use, modal share of journeys into town and so on. It will in turn use District Council figures for air quality to monitor the Plan's effectiveness.

7.4. The process will also continue to seek the views of the Sussex Air Quality Steering Group, consultees and the public in order to gauge effectiveness and suitability of measures being employed.

8. Conclusion

8.1. This study concludes that with the implementation of the Local Transport Plan and use of statutory powers held by the District Council, Nitrogen Dioxide levels within the two AQMAs will be sufficiently reduced by the year 2010 to meet the Government Objective level of 40 μg/m^3.

8.2. Monitoring will continue throughout the district in order to confirm this.

8.3. In summing up, Adur District Council was correct to declare an Air Quality Management Area for High Street , Shoreham-by-Sea and Old Shoreham Road, Southwick in 2005.

Glossary

APEG	Airborne Particles Expert Group
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural (monitoring) Network
CO	Carbon monoxide
COMEAP	Committee on the Medical Effects of Air Pollutants
DA	Detailed Assessment
DEFRA	Department for Environment Food and Rural Affairs
ESCC	East Sussex County Council
HDV	Heavy Duty Vehicles
LAQM	Local Air Quality Management
mg/m^3	Milligrams of the pollutant per cubic meter of air
$\mu g/m^3$	Micrograms of the pollutant per cubic meter of air
ppb	Parts per billion
ppm	Parts per million
NAEI	National Atmospheric Emissions Inventory
NAQS	National Air Quality Strategy
NO	Nitrogen monoxide
NO_2	Nitrogen dioxide
PM_{10}	Particles with diameter less than 10µm
PRG	Progress Report Guidance (LAQM.PRG(03))
QA/QC	Quality Assurance / Quality Control
R&A	Review and Assessment
SAQSG	Sussex Air Quality Steering Group
SO_2	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance
USA	Updating and Screening Assessment
UWE	University of the West of England
WSCC	West Sussex County Council

References

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DEFRA (2003) Local Air Quality Management Policy Guidance. LAQM.PG(03)

DEFRA (2003) Local Air Quality Management Technical Guidance. LAQM.TG(03)

DEFRA (2003) Local Air Quality Management Progress Report Guidance. LAQM.PRG(03)

DEFRA (2003) Compilation of Diffusion Tube Collocation Studies Carried out by Local Authorities – Laxen and Wilson.

DEFRA/UWE/Air Quality Consultants (2004) Diffusion Tube Collocation Bias Correction Factors (http://www.uwe.ac.uk/aqm/review/no2dtbiasdatabase.xls)

The Environment Act (1995)

The Environmental Protection Act (1990)

Appendix I: Monitoring Data – QA/QC and ratification

The automatic monitoring station at Hove Town Hall has been operating for over 5 years. This station consists of a PM_{10} TEOM monitor and a NO_x chemiluminescent analyser. For the TEOM, an adjustment factor of 1.3 has been applied to estimate the gravimetric equivalent concentration. All automatic monitoring data is managed under contract with by Kings College London Environmental Research Group (ERG) and validated against local site operators calibration results, in addition ERG ratify the data sets after 6 monthly services and provide SAQSG members with fully QA/QC ratified data set.

All diffusive monitoring data have been ratified following the methods described in LAQM.TG(03). A quality assurance / quality control (QA/QC) programme including field duplicates and blanks, and instrument calibration with standard gases has been followed (AEAT, 2000).

The NO_2 diffusion tube analysis was carried out at Harwell Scientifics laboratory. The NO_2 tube preparation method used is **50% TEA in Acetone.**
Data from the NO_2 diffusion tubes gas been compared and bias corrected to the factors produced from the UK co-location data-base as produced by University of West of England (UWE) on behalf of DEFRA. The overall factor from 12 studies for 2006 is 0.78 (0.81 for Adur study alone).
(http://www.uwe.ac.uk/aqm/review/no2dtbiasdatabase.xls)

Appendix II: Modelling Data

2006Modelling methodology for LTP2 - A270 (Old Shoreham Rd)

1 Modelling undertaken with BREEZE ROADS Vers 4.0.11

2 **Met years taken as theoretical most recent worst case year (2003)**

3 Background values sourced from the latest update of the NAIE (Jan 2006)

4 Pollutants modelled: NO2 PM10

5 Modelled years =

2004 Baseline year
2005 Baseline year (check)
2006 Intemediate year for APR
2008 Intemediate year for APR
2010 Final target year

5 Model scenarios:

5.1 Scenario a) "do nothing" = model NO2 with no change from original DA modelling
Years = as per item 4.
Model runs : 5 years x 1 pollutants = 5

5.2 Scenario b) "with LTP2 actions" = model NO2 with staged changes from LTP2 actions
Years = as per item 4.
Model runs : 5 years x 1 pollutants = 5

6 Receptors (sensitive) = as per original LAQM DA (21

7 Traffic data and projections of growth c/o WSCC

7.1 A270 (OSRd)

Year	AADT	Growth% (with	%HDV	Comments
2004				
2005	29635	**1.5%**		
2006	30080	**1.5%**		
2007	30531	1.5%		
2008	30683	0.5%		**LTP2 phase I**
2009	30837	0.5%		**Southlands Hosp (prob) closure**
2010	30991	**0.5%**		**LTP2 phase II**

2006 Modelling methodology for LTP2

1 Modelling undertaken with BREEZE ROADS Vers 4.0.11
2 Met year taken= 2003
3 Background values sourced from the latest update of the NAIE (Jan 2006)
4 Pollutants modelled: NO2
5 Modelled years =

2004/5 Baseline year
2006 Intemediate year for APR
2008 Intemediate year for APR
2010 Final target year

5 Model scenarios:

5.1 Scenario a) "do nothing" = model NO2 nad PM10 with no change from original DA modelling
Years = as per item 4.
Model runs = 4 years x 2 pollutants = 8

5.2 Scenario b) "with LTP2 actions" = model NO2 nad PM10 with staged changes from LTP2 actions
Years = as per item 4.
Model runs = 4 years x 2 pollutants = 8

6 Receptors (sensitive) = as per original LAQM DA (2005) 10

7 Traffic data and projections of growth c/o WSCC

7.1 High St

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2003	32	21068			
2004	32	21279	1.0%		
2005	32	21491	**1.0%**	**5.7%**	
2006	32	21706	**1.0%**	**5.7%**	
2007	32	21923	1.0%	5.7%	
2008	32	21923	**0.0%**	**5.7%**	**LTP2 phase I**
2009	32	22932	4.6%	5.7%	**Lady B development increased traffic**
2010	32	22932	**0.0%**	**5.7%**	**LTP2 phase II**

7.2 A259 (Bridge r

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2003	32	25000			
2004	32	25250	1.0%		
2005	32	25503	**1.0%**	**5.7%**	
2006	32	25758	**1.0%**	**5.7%**	
2007	32	26015	1.0%	5.7%	
2008	32	26015	**0.0%**	**5.7%**	**LTP2 phase I**
2009	32	27212	0.0%	5.7%	**Lady B development predict little impact**
2010	32	27212	**0.0%**	**5.7%**	**LTP2 phase II**

7.3 A283

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2003	32	13504			
2004	32	13639	1.0%		
2005	32	13775	**1.0%**	**5.7%**	
2006	32	13913	**1.0%**	**5.7%**	
2007	32	14052	1.0%	5.7%	
2008	32	14052	**0.0%**	**5.7%**	**LTP2 phase I**
2009	32	14699	4.6%	5.7%	**Lady B development increased traffic**
2010	32	14699	**0.0%**	**5.7%**	**LTP2 phase II**

2007 Modelling methodology for LTP2

1 Modelling undertaken with BREEZE ROADS Vers 4.0.11
2 Met year taken= 2005 and 06
3 Background values sourced from the latest update of the NAIE (Jan 2006)
4 Pollutants modelled: NO2
5 Modelled years =

2005 Comparison of actual measured data with 2005 met input data
2006 Intemediate year for APR and compared with 2006 met data and measurements

2010 Final target year

5 Model scenarios:

5.1 Scenario a) review 2005 and 2006 data (NO2 results and actual traffic info) and commpare results with LTPP2 projections
Years = as per item 4.
Model runs = 3 years x 1 pollutants = 2

5.2 Scenario b) "with LTP2 actions" = model NO2 to 2010 with LTP2 actions
Years = 2010
Model runs = 1

6 Receptors (sensitive) = as per original LAQM DA (2005) 10

7 Traffic data and projections of growth c/o WSCC

7.1 High St

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2005	29	21086	1.0%	4.6%	
2006	29	19102	0.0%	4.6%	Actual trafic figures
2010	29	19102	0.0%	4.6%	LTP2 phase II

7.2 A259 (Bridge road)

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2005	29	26499	1.0%	4.6%	
2006	29	26949	0.0%	4.6%	Actual trafic figures
2010	29	26949	0.0%	4.6%	LTP2 phase II

Year	Speed (kph)	AADT	Growth% (with LTP2)	%HDV	Comments
2005	29	12980	1.0%	4.6%	
2006	29	13460	0.0%	4.6%	Actual trafic figures
2010	29	13460	0.0%	4.6%	LTP2 phase II

2007 Modelling methodology for LTP2 - A270 (Old Shoreham Rd)

1 Modelling undertaken with BREEZE ROADS Vers 4.0.11

2 **Met years taken as 2005 for 2005 and 2006 for 2006 & 2010 modelling**

3 Background values sourced from the latest update of the NAIE (Jan 2006)

4 Pollutants modelled: NO2

5 Modelled years =

2005 Baseline year (check) verifying actual measured concentration

2006 Intemediate year for APR- verifying actual measured concentration

2010 Final target year projections using 2006 met & 2005/06 validation

5 Model scenarios:

5.1 Scenario a) review 2005 and 2006 data (NO2 results and actual traffic info) and commpare results with LTPP2 projectio

Years = as per item 4.

Model runs = 2

5.2 Scenario b) "with LTP2 actions" = model NO2 to 2010 with LTP2 actions

Years = 2010

Model runs = **1**

6 Receptors (sensitive) = as per original LAQM DA (21

7 Traffic data and projections of growth c/o WSCC

7.1 A270 (OSRd)

Year	AADT	Growth% (with	%HDV	Comments
2005	29636		**3.0%**	**Actual AADTs, HGV and speeds used**
2006	24984		**3.0%**	**Actual AADTs, HGV and speeds used**
2010	30400	**1.1%**	**3.0%**	**Projected AADT**

WSCC - High St, Shoreham Adur District Council - LTP2 Air Quality modelling of NO2

Updated: June 2007

Summary Adur 2005 & 2010 - High St, Shoreham AQ model outputs

Objective:

1 Predict concentrations of NO2 contributed by road traffic sources for baseline and future years.

1.1 Establish baseline year predictions of NO2 (from monitored and modelled NO2 conc.)

1.2 Model future year predictions of NO2 (to 2010).

2 Produce scenario projections for LTP2

2.1 "Do nothing/business as usual" projection of baseline and future years (2004 - 2010)

2.2 "Do something/LTP2 implimentation" projections of future years (2006 - 2010)

Results:

Table 1.

1.1 Shows modelled NO2 contribution from road traffic at most sensitive receptor (No96)

1.2 Difference between "do nothing" and LTP2 actions = "Improvement (LTP2)"

Year	Base year 2004	2006	Improvement (LTP2)	2008	Improvement (LTP2)	2010	Improvement (LTP2)
NO2 contrib (µg/m3)	20.71	17.52	0.00	15.47	-0.32	13.60	-1.46

Table 2.

2.1 Shows modelled NO2 "Totals" in AQMA at most sensitive receptor

2.2 Difference between "do nothing" and LTP2 actions = "Improvement (LTP2)"

2.3 The values in "yellow" below can be used as stretch target values, however due to the modelling acuracy,

Year	Base year 2004	2005	2006	Improvement (LTP2)	2008	Improvement (LTP2)	2010	Improvement (LTP2)
NO2 total (µg/m3)	40.42	37.85	36.20	0.00	33.18	-0.32	30.33	-1.46
NO2 suggested targets	41.50		38.20		35.18		32.33	
"Non-stretch targets"	41.50		40		37		34.6	

suggest +/-2µg/m3 (10% range).A conservative value would be +2µg/m3 for years 2006, 2008 & 2010

Table 3.

3.1 The 2007 PR resullts show the re-modelled "Intermediate" Indicator concentrations for reporting on LTP2 for 2007

3.2 The Indicator receptor has been designated as NO86 High St (NO2 Diffusion Tube)

		2005	2006			2010 projected NO2	
2007 PR results		45.7	39.78			35.23	

Results from predicted NO2 contribution from BREEZE ROADS model

Table4: Modelled NO2 "contribution" from traffic sources.

Modelled NO2 "contribution" from traffic sources.	Baseline year:					Intermediate year:					Intermediate year:			LTP2 final year:				
	2004			2005			2006			2006		2008			2010			2010	
	Do nothing			"do nothing"	Remodelled (07) with 2005 met	"Difference"	Do nothing	LTP2	"Difference"	with 2006 met (07)	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	with 2006 met (07)	"Difference"
Sensitive Rec.																			
1 NO96	20.71			18.35	14.54	-26%	17.51	17.52	0%	11.43	-52%	15.79	15.47	-2%	15.06	13.60	-11%	10.08	-49%
2 CLUB 102 -110	15.42			13.63	10.90	-25%	11.06	11.07	0%	8.45	-31%	9.94	9.72	-2%	11.15	8.55	-30%	7.40	-51%
3 NO112	15.29			13.51	10.80	-25%	9.64	9.65	0%	8.30	-16%	8.66	8.46	-2%	11.05	7.50	-47%	7.28	-52%
4 NO76	10.51			9.25	20.55	55%	9.76	9.77	0%	16.67	38%	8.77	8.57	-2%	7.55	7.62	1%	13.77	45%
5 NO 78	11.13			9.80	21.61	55%	10.37	10.38	0%	16.63	38%	9.32	9.11	-2%	8.00	8.08	1%	14.60	45%
6 NO80	12.66			11.16	23.50	53%	12.03	12.04	0%	18.52	35%	10.82	10.58	-2%	9.12	9.35	2%	16.24	44%
7 NO77	11.54			10.16	21.06	52%	10.84	10.85	0%	14.41	25%	9.75	9.53	-2%	8.30	8.49	2%	12.64	34%
8 NO86	16.53			14.61	26.20	44%	16.28	16.30	0%	21.30	24%	14.68	14.37	-2%	11.96	12.65	5%	18.63	36%
9 NO87A	18.74			16.57	35.53	53%	15.54	15.55	0%	27.44	43%	14.00	13.71	-2%	13.60	11.88	-14%	23.89	43%
10 THE BRIDGE Pub	11.15			9.82	11.32	13%	10.58	10.59	0%	8.27	-25%	9.51	9.30	-2%	8.02	8.08	1%	7.18	-12%
Avg	14.4			12.7		25%	12.4	12.4	0%		7%	11.1	10.9	-2%	10.4	9.6	-9%		8%
Max difference	20.7			18.4			17.5	17.5				15.8	15.5		15.1	13.6			

Table5: Modelled NO2 "Total".

Modelled NO2 "Total" (µg/m3)	Baseline year:					Intermediate year:					Intermediate year:			LTP2 final year:				
	2004			2005			2006			Remodelled with 2006 met (07)	"Difference"	2008			2010			Remodelled with 2006 met (07)	"Difference"
	Do nothing			Do nothing	Remodelled (07) with 2005 met	"Difference"	Do nothing	LTP2	"Difference"			Do nothing	LTP2	"Difference"	Do nothing	LTP2	Difference		
Sensitive Rec.																			
1 NO96	40.42			37.85	34.0	-11%	36.19	36.20	0%	29.97	-21%	33.50	33.18	-1%	31.66	30.33	-4%	26.68	-19%
2 CLUB 102 -110	35.14			33.13	30.4	-9%	29.74	29.75	0%	26.93	-10%	27.85	27.43	-1%	27.75	25.29	-10%	24.00	-16%
3 NO112	35.00			33.01	30.3	-9%	28.32	28.33	0%	26.78	-6%	26.36	26.17	-1%	27.65	24.24	-14%	23.88	-16%
4 NO76	30.22			28.75	40.1	28%	28.44	28.45	0%	34.16	17%	26.48	26.28	-1%	24.15	24.36	1%	30.37	20%
5 NO 78	30.84			29.30	41.1	29%	29.05	29.06	0%	35.12	17%	27.03	26.82	-1%	24.60	24.82	1%	31.20	21%
6 NO80	32.37			30.66	43.0	29%	30.71	30.72	0%	37.01	17%	28.53	28.29	-1%	25.72	26.08	1%	32.84	22%
7 NO77	31.25			29.66	40.8	27%	29.52	29.53	0%	32.89	10%	27.46	27.24	-1%	24.90	25.22	1%	29.24	15%
8 NO86 NO2 Diff Tube	36.24			34.11	45.7	25%	34.97	34.98	0%	39.78	12%	32.39	32.08	-1%	28.56	29.38	3%	35.23	19%
9 NO87A	38.45			36.07	55.0	34%	34.22	34.23	0%	45.93	25%	31.71	31.42	-1%	30.20	28.62	-6%	40.49	25%
10 THE BRIDGE Pub	30.86			29.32	30.8	5%	29.26	29.27	0%	26.75	-9%	27.22	27.00	-1%	24.62	24.82	1%	23.78	-4%
Avg	34.1			32.2		15%	31.0	31.1	0%		5%	28.8	28.6	-1%	27.0	26.3	-3%		7%
Max difference	40.4			37.9			36.2	36.2				33.5	33.2	-0.3	31.7	30.3			

WSCC - LTP2 Air Quality modelling of NO2

Summary Adur 2005 & 2010 - Old Shoreham Rd, Shoreham AQ model outputs

Objective:

1 Predict concentrations of NO2 contributed by road traffic sources for baseline and future years.

1.1 Establish baseline year predictions of NO2 (from monitored and modelled NO2 conc.)

1.2 Model future year predictions of NO2 (to 2010).

2 Produce scenario projections for LTP2

2.1 "Do nothing/business as usual" projection of baseline and future years (2004 - 2010)

2.2 "Do something/LTP2 implimentation" projections of future years (2006 - 2010)

Results:

Table 1.

1.1 Shows modelled NO2 contribution from road traffic at most sensitive receptor (No4)

1.2 Difference between "do nothing" and LTP2 actions = "Improvement (LTP2)"

Year	Base year 2004	2006	Improvement (LTP2)	2008	Improvement (LTP2)	2010	Improvement (LTP2)
NO2 conti (µg/m3)	20.60	18.45	-0.09	16.50	-0.24	14.99	-0.49

Table 2.

2.1 Shows modelled NO2 "Totals" in AQMA at most sensitive receptor

2.2 Difference between "do nothing" and LTP2 actions = "Improvement (LTP2)"

2.3 The values in "yellow" below can be used as stretch target values, however due to the modelling input accuracies/error, suggest +/-2µg/m3 (10% range).A conservative value would be +2µg/m3 for years 2006, 2008 & 2010.

Year	Base year 2004	2006	Improvement (LTP2)	2008	Improvement (LTP2)	2010	Improvement (LTP2)
NO2 total (µg/m3)	41.84	37.13	-0.09	34.21	-0.24	32.79	1.20
NO2 suggested targets	41.00	39.13		36.21		34.79	
"Non-stretch targets"	41.00	40		38		36	

Notes:

1 Modelling for Adur DC, Old Shoreham Rd, Shoreham

2 January 2006

3 Comparison of 2005 and 2010 predicted NO2 at selected receptor positions

4 Modelled with BREEZE ROADS V 4.011

5 Correction factors for NOx and NO2 updated Jan06 (ref: XL tab "NOx &NO2 validation CF + 2003 sensitivity modelling")

6 Emissions factors sources from: EF2002EF Vers2a.xls using 4% HDV, 32-45kph avg speed (cold start)

6.1 **(Assumption that vehicle mix has same EF as projected UK fleet composition)**

7 Traffic data supplied by WSCC - 2000 veh counts with avg 1.5 -0.5% growth

8 Bkgrd values (Nox & **NO2**) - 2005 = 32 µg/m3 **21 µg/m3** 2010 = 25.2 µg/m **17.8 µg/m3**

Results from predicted NO2 contribution from BREEZE ROADS model

Table 1.: Modelled NO2 "contribution" from traffic sources.

Table 1.: Modelled NO2 "contribution" from traffic sources. (µg/m3)		Baseline year: 2004			2005			Intemediate year: 2006			Intemediate year: 2008			LTP2 final year: 2010		
		Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"
Sensitive Rec.																
1	2	18.97			18.23	18.14		17.12	17.05	-0.07	15.41	15.21	-0.20	14.25	13.81	-0.44
2	4	20.60			19.80	19.68		18.54	18.45	-0.09	16.74	16.50	-0.24	15.48	14.99	-0.49
3	14	18.38			17.66	17.56		16.52	16.43	-0.09	14.91	14.69	-0.22	13.79	13.35	-0.44
4	22	17.42			16.75	16.64		15.64	15.56	-0.08	14.12	13.91	-0.21	13.06	12.64	-0.42
5	32	16.49			15.86	15.75		14.80	14.72	-0.08	13.36	13.16	-0.20	12.35	11.95	-0.40
6	40	15.07			14.49	14.39		13.51	13.44	-0.08	12.19	12.00	-0.19	11.28	10.91	-0.37
7	52	14.83			14.27	14.16		13.30	13.22	-0.08	12.00	11.81	-0.19	11.10	10.73	-0.37
8	43	9.06			8.72	8.65		8.11	8.06	-0.05	7.30	7.19	-0.12	6.75	6.52	-0.23
9	33	9.70			9.33	9.26		8.68	8.63	-0.05	7.82	7.70	-0.12	7.23	6.99	-0.24
10	23	10.22			9.83	9.76		9.16	9.11	-0.05	8.25	8.12	-0.13	7.63	7.37	-0.26
11	13	10.89			10.47	10.40		9.77	9.72	-0.05	8.80	8.66	-0.13	8.13	7.86	-0.27
12	5	12.56			12.08	12.00		11.29	11.24	-0.05	10.17	10.02	-0.15	9.39	9.09	-0.31
13	NO1 (SW)	15.03			14.44	14.36		13.52	13.47	-0.06	12.19	12.01	-0.17	11.26	10.90	-0.36
14	4 KGSTNLN	14.97			14.39	14.33		13.55	13.50	-0.05	12.18	12.03	-0.15	11.23	10.88	-0.34
15	2 KGSTNWAY	15.65			15.04	14.98		14.15	14.11	-0.05	12.74	12.58	-0.16	11.74	11.38	-0.36
16	1 KGSTNWAY	18.52			17.80	17.73		16.79	16.73	-0.05	15.12	14.93	-0.18	13.92	13.51	-0.42
17	11 KGSTNWAY	13.91			13.37	13.32		12.57	12.54	-0.04	11.32	11.18	-0.14	10.42	10.10	-0.32
18	8 KGSTNWAY	14.23			13.67	13.62		12.86	12.82	-0.04	11.57	11.43	-0.14	10.66	10.34	-0.32
19	5 KGSTNWAY	15.00			14.41	14.35		13.55	13.51	-0.04	12.20	12.05	-0.15	11.24	10.90	-0.34
20	NO1(NW)	13.21			12.69	12.62		11.90	11.85	-0.05	10.71	10.56	-0.15	9.89	9.57	-0.32
21	NO2 TUBE	17.51			16.83	16.73		15.76	15.69	-0.07	14.22	14.02	-0.20	13.14	12.72	-0.42
	Avg				14.29	14.21		13.39	13.33	-0.06	12.06	11.89	-0.17	11.14	10.79	-0.35
	Max				19.80	19.68		18.54	18.45	-0.09	16.74	16.50	-0.24	15.48	14.99	-0.49
Max Improvement										-0.09			-0.24			-0.49

Table 2.: Modelled NO2 "Total".

Table 2.: Modelled NO2 "Total"(µg/m3)		Baseline year: 2004			2005			Intemediate year: 2006			Intemediate year: 2008			LTP2 final year: 2010		
		Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"	Do nothing	LTP2	"Difference"
Sensitive Rec.																
1	2	40.21			39.23	39.14		35.80	35.73	-0.07	33.12	32.92	-0.20	32.04	31.61	-0.43
2	4	41.84			40.80	40.68		37.22	37.13	-0.09	34.45	34.21	-0.24	31.59	32.79	1.20
3	14	39.62			38.68	38.58		35.20	35.11	-0.09	32.62	32.40	-0.22	30.48	31.15	0.66
4	22	38.66			37.75	37.64		34.32	34.24	-0.08	31.83	31.62	-0.21	30.86	30.44	-0.42
5	32	37.73			36.86	36.75		33.48	33.40	-0.08	31.07	30.86	-0.20	30.59	29.75	-0.84
6	40	36.31			35.49	35.39		32.19	32.12	-0.08	29.90	29.71	-0.19	30.15	28.71	-1.45
7	52	36.07			35.27	35.16		31.98	31.90	-0.08	29.71	29.52	-0.19	27.16	28.53	1.37
8	43	30.30			29.72	29.65		26.79	26.74	-0.05	25.01	24.90	-0.12	28.54	24.32	-4.22
9	33	30.93			30.33	30.26		27.36	27.31	-0.05	25.53	25.41	-0.12	29.08	24.79	-4.29
10	23	31.46			30.83	30.76		27.84	27.79	-0.05	25.96	25.83	-0.13	28.46	25.17	-3.29
11	13	32.13			31.47	31.40		28.45	28.40	-0.05	26.51	26.37	-0.13	26.36	25.66	-0.70
12	5	33.80			33.08	33.00		29.97	29.92	-0.05	27.88	27.73	-0.15	28.90	26.89	-2.01
13	NO1 (SW)	36.26			35.44	35.36		32.21	32.15	-0.06	29.89	29.72	-0.17	25.87	28.70	2.82
14	4 KGSTNLN	36.21			35.39	35.33		32.23	32.18	-0.05	29.89	29.73	-0.15	28.21	28.68	0.47
15	2 KGSTNWAY	36.89			36.04	35.98		32.83	32.79	-0.05	30.45	30.29	-0.16	25.18	29.18	4.00
16	1 KGSTNWAY	39.76			38.80	38.73		35.47	35.42	-0.05	32.83	32.64	-0.18	27.05	31.31	4.26
17	11 KGSTNWAY	35.15			34.37	34.32		31.26	31.22	-0.04	29.03	28.89	-0.14	26.45	27.90	1.46
18	8 KGSTNWAY	35.47			34.67	34.62		31.54	31.50	-0.04	29.28	29.14	-0.14	25.07	28.14	3.07
19	5 KGSTNWAY	36.23			35.41	35.36		32.23	32.19	-0.04	29.91	29.76	-0.15	22.17	28.70	6.53
20	NO1(NW)	34.44			33.69	33.62		30.58	30.53	-0.05	28.42	28.27	-0.15	21.93	27.37	5.44
21	NO2 TUBE	38.75			37.83	37.73		34.44	34.37	-0.07	31.93	31.72	-0.20	24.55	30.52	5.97
	Avg				35.29	35.21		32.07	32.01	-0.06	29.77	29.60	-0.17	27.65	28.59	0.93
	Max				40.80	40.68		37.22	37.13	-0.09	34.45	34.21	-0.24	32.04	32.79	0.75
Max Improvement										-0.09			-0.24			4.29

WSCC - LTP2 Air Quality modelling of NO2 (May 2007)

Summary Adur 2005, 2006 & 2010 - Old Shoreham Rd, Shoreham AQ model outputs

Objective:

1 Predict concentrations of NO2 contributed by road traffic sources for baseline and future years.
1.1 Verify measurements against modelled predictions of NO2 (from monitored and modelled NO2 conc.)
1.2 Model future year predictions of NO2 (to 2010).
2 Produce scenario projections for LTP2
2.1 Scenario a) review 2005 and 2006 data (NO2 results and actual traffic info) and commpare results with LTP2 projections
2.2 Scenario b) "with LTP2 actions" = model NO2 to 2010 with LTP2 actions

Notes:

1 Modelling for Adur DC, Old Shoreham Rd, Shoreham
2 May-07
3 Comparison of 2005, 2006 and 2010 predicted NO2 at selected receptor positions
4 Modelled with BREEZE ROADS V 4.011
5 Correction factors for NOx and NO2 updated May07
6 Emissions factors sources from: EF2002EF Vers2a.xls using 3% HDV, 62kph avg speed (cold start)
7 Traffic data supplied by WSCC - 2005 veh counts with avg 2066-2010 at 1.1% growth

Results from predicted NO2 contribution from BREEZE ROADS model

Table1: Modelled NO2 "contribution" from traffic sources.

Modelled NO2 "contribution" from traffic sources.		Baseline year:			Intemediate year:	LTP2 final year:		
		2005			2006	2010		
		Modelled Do nothing (µg/m³)	Actual - remodelled 2005 (met 05) (µg/m³)	"Difference"	Modelled 2006 (met06 (µg/m³)	Do nothing - modelling(05) (µg/m³)	Intermed year (06) projection (µg/m³)	"Difference"
Sensitive Rec.								
1	2	17.7	27.2	35%	19.0	13.4	17.9	25%
2	4	19.7	30.1	34%	19.9	14.9	19.1	22%
3	14	17.9	27.1	34%	17.5	13.5	16.9	20%
4	22	17.0	25.8	34%	16.5	12.9	15.9	19%
5	32	16.2	24.5	34%	15.6	12.2	15.1	19%
6	40	14.9	22.9	35%	14.4	11.2	14.0	20%
7	52	14.7	23.0	36%	14.4	11.0	14.1	22%
8	43	9.0	14.7	38%	10.1	6.8	9.8	31%
9	33	9.6	15.6	38%	10.7	7.2	10.4	31%
10	23	10.1	16.3	38%	11.2	7.6	10.9	30%
11	13	10.6	17.0	38%	11.8	7.9	11.4	30%
12	5	12.0	19.5	38%	13.7	9.0	13.0	31%
13	NO1 (SW)	14.2	23.5	40%	16.5	10.7	15.7	32%
14	4 KGSTNLN	10.5	13.7	23%	9.2	7.9	8.7	10%
15	2 KGSTNWAY	9.6	13.4	28%	8.6	7.2	8.2	12%
16	1 KGSTNWAY	10.6	14.6	27%	9.5	8.0	9.1	12%
17	11 KGSTNWAY	8.1	10.9	26%	6.8	6.1	6.5	7%
18	8 KGSTNWAY	8.6	11.7	27%	7.3	6.4	7.1	9%
19	5 KGSTNWAY	9.1	12.5	27%	7.9	6.8	7.6	11%
20	NO1(NW)	12.2	21.4	43%	15.0	9.2	14.1	35%
21	NO2 TUBE	16.8	27.1	38%	19.1	12.6	18.2	31%
	Average receptors	11.2	16.8	32%	11.3	8.4	10.8	19%

Table2: Modelled NO2 "Total".

Modelled NO2 "Total" (µg/m3)		Baseline year:			Intemediate year:	LTP2 final year:		
		2005			2006	2010		
		Modelled Do nothing (µg/m³)	Actual - remodelled 2005 (met 05) (µg/m³)	"Difference"	Modelled 2006 (met06 (µg/m³)	Do nothing - modelling(05) (µg/m³)	Intermed year (06) projection (µg/m³)	"Difference"
Sensitive Rec.								
1	2	38.7	48.2	20%	38.9	31.2	35.7	13%
2	4 OSR (LTP2 Receptor)	40.7	51.1	20%	39.8	32.7	36.9	11%
3	14	38.9	48.1	19%	37.4	31.3	34.7	10%
4	22	38.0	46.8	19%	36.4	30.7	33.7	9%
5	32	37.2	45.5	18%	35.5	30.0	32.9	9%
6	40	35.9	43.9	18%	34.3	29.0	31.8	9%
7	52	35.7	44.0	19%	34.3	28.8	31.9	10%
8	43	30.0	35.7	16%	30.0	24.6	27.6	11%
9	33	30.6	36.6	16%	30.6	25.0	28.2	11%
10	23	31.1	37.3	17%	31.1	25.4	28.7	12%
11	13	31.6	38.0	17%	31.7	25.7	29.2	12%
12	5	33.0	40.5	18%	33.6	26.8	30.8	13%
13	NO1 (SW)	35.2	44.5	21%	36.4	28.5	33.5	15%
14	4 KGSTNLN	31.5	34.7	9%	29.1	25.7	26.5	3%
15	2 KGSTNWAY	30.6	34.4	11%	28.5	25.0	26.0	4%
16	1 KGSTNWAY	31.6	35.6	11%	29.4	25.8	26.9	4%
17	11 KGSTNWAY	29.1	31.9	9%	26.7	23.9	24.3	2%
18	8 KGSTNWAY	29.6	32.7	10%	27.2	24.2	24.9	3%
19	5 KGSTNWAY	30.1	33.5	10%	27.8	24.6	25.4	3%
20	NO1(NW)	33.2	42.4	22%	34.9	27.0	31.9	15%
21	NO2 TUBE	37.8	48.1	22%	39.0	30.4	36.0	16%
	Average receptors (µg/m³)	32.2	37.8	14%	31.3	26.2	28.6	8%
	No. receptors >40µg/m³	0	4		0	0	0	
	No. receptors >36µg/m³ (within 10%)	1	4		2	0	1	
	Average area receptors (µg/m³)	29.6	34.5	14%	28.9	24.3	26.4	8%

4 Old Shoreham Road (closest receptor)has been designated the indicator receptor.

WSCC - LTP2 Air Quality modelling of NO2 (June 2007)

Summary Adur 2005, 2006 & 2010 - High St, Shoreham AQ model outputs
Objective:

1 Predict concentrations of NO2 contributed by road traffic sources for baseline and future years.
1.1 Verify measurements against modelled predictions of NO2 (from monitored and modelled NO2 conc.)
1.2 Model future year predictions of NO2 (to 2010).
2 Produce scenario projections for LTP2
2.1 Scenario a) review 2005 & 2006 data (NO2 results & actual traffic info) & compare results with LTP2 projections
2.2 Scenario b) "with LTP2 actions" = model NO2 to 2010 with LTP2 actions

Notes:

1 Modelling for Adur DC High St, Shoreham
2 May 2007
3 Comparison of 2005, 2006 and 2010 predicted NO2 at selected receptor positions
4 Modelled with BREEZE ROADS V 4.011
5 Correction factors for NOx and NO2 updated May07
6 Emissions factors sources from: EF2002EF Vers2a.xls using 4.5% HDV, 29kph avg speed (cold start)
7 Traffic data supplied by WSCC - 2005/6 veh counts with avg 0% growth

Results from predicted NO2 contribution from BREEZE ROADS model

Table1: Modelled NO2 "contribution" from traffic sources.

Modelled NO2 "contribution" from traffic sources.	Baseline year:			Intemediate year:	LTP2 final year:		
	2005			2006	2010		
	Original - modelling(05) (µg/m³)	Actual - remodelled 2005 (met 05) (µg/m³)	"Difference"	Modelled 2006 (met06 (µg/m³)	Original - modelling(05) (µg/m³)	Intermed year (06) projection (µg/m³)	"Difference"
Sensitive Rec.							
1 NO96	17.9	17.0	-5%	12.2	14.7	10.7	-38%
2 CLUB 102 -110	13.3	13.5	1%	9.4	10.9	8.3	-31%
3 NO112	13.2	13.7	4%	9.5	10.8	8.4	-28%
4 NO76	9.0	25.8	65%	17.8	7.4	15.7	53%
5 NO 78	9.5	26.6	64%	18.5	7.8	16.3	52%
6 NO80	10.9	27.7	61%	19.8	8.9	17.4	49%
7 NO77	9.9	26.5	63%	16.4	8.1	14.4	44%
8 NO86 NO2 Diff Tube location	14.2	28.6	50%	21.2	11.7	18.4	37%
9 NO87A	16.1	40.8	60%	29.0	13.2	25.1	47%
10 THE BRIDGE Pub	9.6	12.6	24%	8.5	7.8	7.3	-7%
Average receptors	12.4	23.3	39%	16.2	10.1	14.2	18%

Table2: Modelled NO2 "Total".

Modelled NO2 "Total" (µg/m3)	Baseline year:			Intemediate year:	LTP2 final year:		
	2005			2006	2010		
	Original - modelling(05) (µg/m³)	Actual - remodelled 2005 (met 05) (µg/m³)	"Difference"	Modelled 2006 (met06 (µg/m³)	Original - modelling(05) (µg/m³)	Intermed year (06) projection (µg/m³)	"Difference"
Sensitive Rec.							
1 NO96	37.4	36.5	-2%	30.7	31.3	27.3	-15%
2 CLUB 102 -110	32.8	33.0	1%	27.9	27.5	24.9	-10%
3 NO112	32.7	33.2	2%	28.0	27.4	25.0	-9%
4 NO76	28.5	45.3	37%	36.3	24.0	32.3	26%
5 NO 78	29.0	46.1	37%	37.0	24.4	32.9	26%
6 NO80	30.4	47.2	36%	38.3	25.5	34.0	25%
7 NO77	29.4	46.0	36%	34.9	24.7	31.0	20%
8 NO86 NO2 Diff Tube location	33.7	48.1	30%	39.7	28.3	35.0	19%
9 NO87A	35.6	60.3	41%	47.5	29.8	41.7	28%
10 THE BRIDGE Pub	29.1	32.1	9%	27.0	24.4	23.9	-2%
Average receptors (µg/m³)	31.9	42.8	23%	34.7	26.7	30.8	11%
No. receptors >40µg/m³	0	6		1	0	1	
No. receptors >36µg/m³ (within 10%)	1	7		5	0	1	
Average area receptors (µg/m³)	28.8	29.1	1%	25.2	24.2	22.5	-8%

NO86 High St (NO2 Diffusion Tube)has been designated the indicator receptor.

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