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Air Quality Plan for the achievement of EU air quality limit values for nitrogen dioxide (NO_2) in Coventry/Bedworth (UK0017)

September 2011

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http://uk-air.defra.gov.uk/library/no2ten/

Published by the Department for Environment, Food and Rural Affairs

Contents

1. Introduction

1.1. This document

This document is the Coventry/Bedworth (UK0017) air quality plan for the achievement of the EU air quality limit values for nitrogen dioxide (NO_2).

This plan presents the following information:

- General information regarding the Coventry/Bedworth agglomeration zone
- Details of NO_2 exceedence situation(s) within the Coventry/Bedworth agglomeration zone
- Details of local air quality measures that have been implemented, will be implemented or are being considered for implementation in this agglomeration zone.

This air quality plan for Coventry/Bedworth should be read in conjunction with the separate UK overview document and the list of UK and national measures that are available on the Defra website (http://www.defra.gov.uk/environment/quality/air/air-quality/eu/). The UK overview document sets out, amongst other things, the authorities responsible for delivering air quality improvements and the national measures that are applied in some or all UK zones. The measures presented in this plan and the accompanying UK overview and list of UK measures show how the UK will ensure that compliance with the NO_2 limit values is achieved as soon as possible.

This plan should also be read in conjunction with the supporting UK technical report (http://www.defra.gov.uk/environment/quality/air/air-quality/eu/), which presents information on assessment methods, input data and emissions inventories used in the analysis presented in this plan.

1.2. Context

Two NO_2 limit values for the protection of human health have been set in the Air Quality Directive (2008/50/EC). These are:

- The annual limit value: an annual mean concentration of no more than 40 μgm^{-3}
- The hourly limit value: no more than 18 hourly exceedances of 200 μgm^{-3} in a calendar year

The Air Quality Directive stipulates that compliance with the NO_2 limit values will be achieved by 01/01/2010. However, where the limit values cannot be achieved by then, the Directive also allows Member States to postpone this attainment date until 01/01/2015 provided air quality plans are established demonstrating how the limit values will be met by this extended deadline.

1.3. Zone status

The assessment undertaken for the Coventry/Bedworth agglomeration zone indicates that the annual limit value is likely to be exceeded in 2010 but achieved before 2015 through introduction of the measures included in the baseline and the non-quantifiable local measures outlined in this plan. Postponement of the compliance date to 2015 is sought for this limit value for this zone.

The assessment undertaken for the Coventry/Bedworth agglomeration zone indicates that the hourly limit value not exceeded in this agglomeration zone in 2008.

1.4. Plan structure

General administrative information regarding this agglomeration zone is presented in section 2.

Section 3 then presents the overall picture with respect to NO_2 levels in this agglomeration zone for the 2008 reference year of this air quality plan. This includes the declaration of exceedance situations within the agglomeration zone and presentation of a detailed source apportionment for each exceedance situation.

An overview of the measures already taken and to be taken within the agglomeration zone both before and after 2010 is given in section 4.

Baseline modelled projections for 2010, 2015 and 2020 for each exceedance situation are presented in section 5. The baseline projections presented here include, where possible, the impact of measures that have already been taken and measures for which the relevant authority has made a firm commitment to take the measure(s). However, it has not been possible to quantify the impact of all measures. This section therefore also explains which measures have been quantified, and hence included in the model projections, and which measures have not been quantified.

2. General Information about the Zone

2.1. Administrative information

Zone name: Coventry/Bedworth
Zone code: UK0017
Type of zone: agglomeration zone
Reference year: 2008
Extent of zone: Figure 1 shows the area covered by the Coventry/Bedworth agglomeration zone

Local Authorities within the agglomeration zone: Figure 2 shows the location of Local Authorities within the agglomeration zone. A list of these Local Authorities is also given below. The numbers in this list correspond to the numbers in Figure 2.

1. Coventry City Council
2. Nuneaton and Bedworth Borough Council
3. Rugby Borough Council
4. Warwick District Council

(Note: Local Authority boundaries do not necessarily coincide with zone boundaries. Hence Local Authorities may be listed within more than one zone plan.)

Figure 1. Map showing the extent of the Coventry/Bedworth agglomeration zone (UK0017).

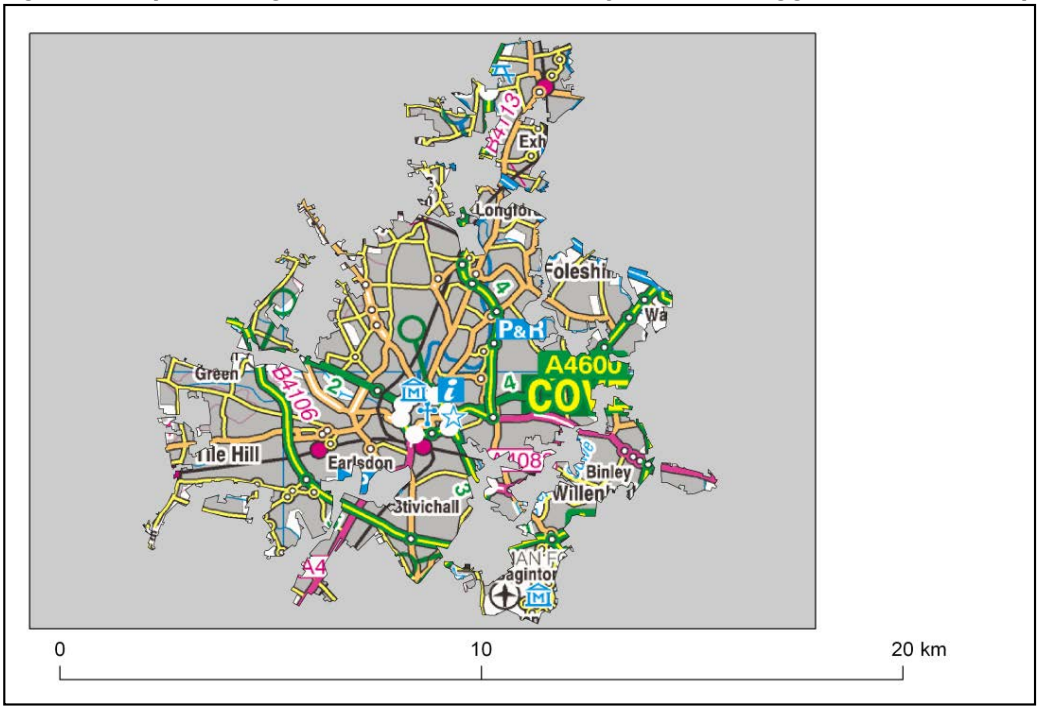
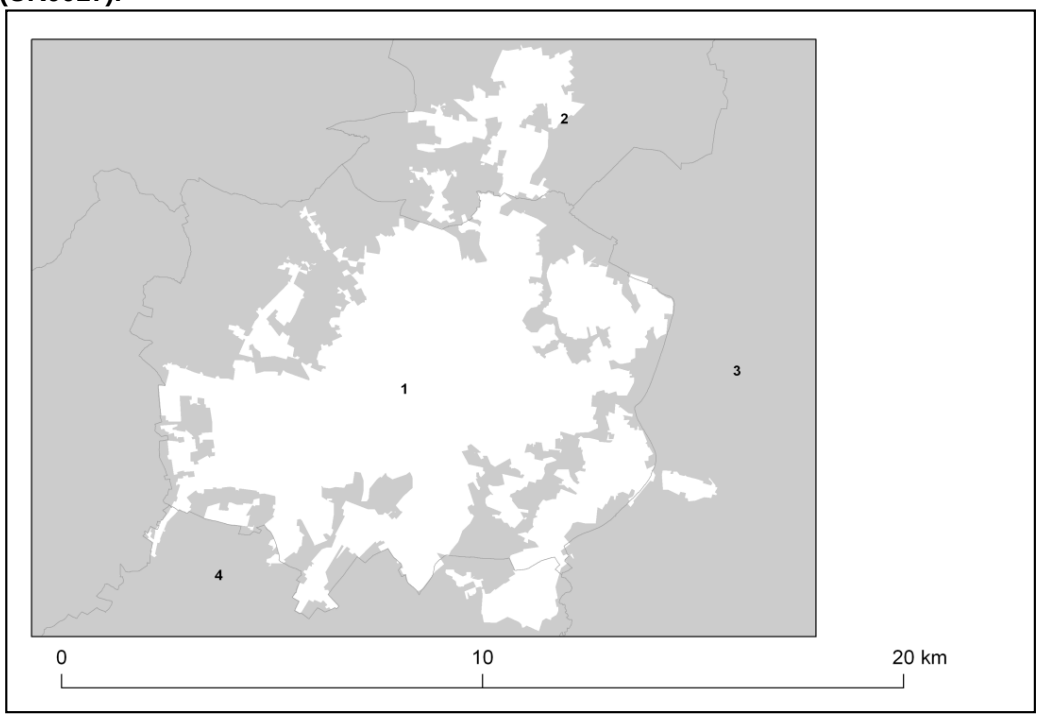


Figure 2. Map showing Local Authorities within the Coventry/Bedworth agglomeration zone (UK0017).



2.2. Assessment details

Measurements
NO_2 measurements in this zone were available in 2008 from the following national network monitoring stations (NO_2 data capture for each station in 2008 shown in brackets):

• Coventry Memorial Park GB0739A (99.2%)

Full details of monitoring stations within the Coventry/Bedworth agglomeration zone are available from http://uk-air.defra.gov.uk/networks/network-info?view=aurn.

Modelling
Modelling for the 2008 reference year has been carried out for the whole of the UK (see the UK technical report). This modelling covers the following extent within this zone:

• Total background area within zone (approx): 76 km^2
• Total population within zone (approx): 277475 people
• Total road length where an assessment of NO_2 concentrations have been made: 36 km in 2008 (and similar lengths in previous years).

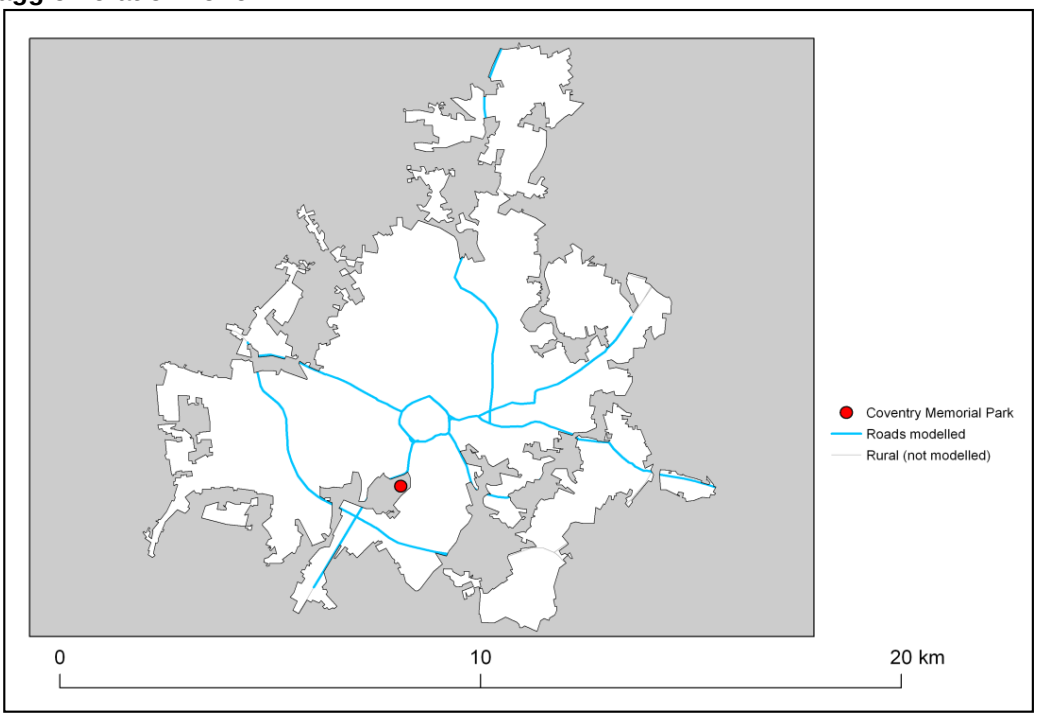
Zone maps
Figure 3 presents the location of the NO_2 monitoring stations within this zone for 2008 and the roads for which NO_2 concentrations have been modelled. NO_2 concentrations at background locations have been modelled across the entire zone at a 1 x 1 km^2 resolution.

2.3. Reporting Under European Directives

Since 2001 the UK has reported annually on air quality concentrations using a standard excel questionnaire (Decision 2004/461/EC). These questionnaires are available online from http://cdr.eionet.europa.eu/gb/eu/annualair

In addition, the UK has reported on air quality plans and programmes (Decision 2004/224/EC) on an annual basis depending on the reported concentrations in the previous year. Plans and programmes were first reported in this zone in 2005. Plans and programmes for 2005 and all other years for which they have been required are available from http://cdr.eionet.europa.eu/gb/eu/aqpp.

Figure 3. Map showing the location of the NO_2 monitoring sites with valid data in 2008 and roads where concentrations have been modelled within the Coventry/Bedworth (UK0017) agglomeration zone.



3. Overall Picture for 2008 reference year

3.1. Introduction

There are two limit values for the protection of health for NO_2. These are:

- The annual limit value (annual mean concentration of no more than 40 μgm^{-3})
- The hourly limit value (no more than 18 hourly exceedances of 200 μgm^{-3} in a calendar year)

Within the Coventry/Bedworth agglomeration zone only the annual limit value was exceeded in 2008. Hence, one exceedance situation for this zone has been defined, NO_2_UK0017_Annual_1, which covers the exceedance of the annual limit value. This exceedance situation is described below.

For both NO_2 limit values, a margin of tolerance for 2008 and other years has been defined in the Air Quality Directive (2008/50/EC). Data comparing assessed concentrations at locations within this agglomeration zone with the 2008 margin of tolerance are presented in the annual reporting questionnaire for 2008 (http://cdr.eionet.europa.eu/gb/eu/annualair).

3.2. Reference year: NO_2_UK0017_Annual_1

The NO_2_UK0017_Annual_1 exceedance situation covers all exceedances of the annual mean limit value in the Coventry/Bedworth agglomeration zone in 2008.

Compliance with the annual limit value in this exceedance situation has been assessed using a combination of air quality measurements and modelling. Table 1 presents measured annual mean concentrations at national network stations in this exceedance situation since the 1st Daughter Directive (1999/30/EC) came into force in 2001. This shows that there were no measured exceedances of the annual limit value in this zone in 2008. Table 2 summarises modelled annual mean NO_2 results in this exceedance situation for the same time period. This table shows that, in 2008, 10.6 km of road length was modelled to exceed the annual limit value. There were no modelled background exceedances of this limit value. Table 2 also shows that the maximum modelled annual mean NO_2 concentration in 2008 was 51.9 μgm^{-3}. Maps showing the modelled annual mean NO_2 concentrations for 2008 at background and at roadside locations are presented in Figures 4 and 5 respectively. All modelled exceedances of the annual limit value are coloured orange or red in these maps.

The maximum measured concentration in the zone varies due to changes emissions and varying meteorology in different years. However, the models are also updated each year to take into account the most up-to-date science, so the modelled results for different years may not be directly comparable.The increase in the maximum modelled annual mean NO_2 concentration between 2008 and 2009 (51.9 μgm^{-3} to 85.4 μgm^{-3}) occurred because the location with the highest modelled concentration in this agglomeration zone moved between 2008 and 2009. The location with highest concentration in 2009 was included in the assessment for the first time in 2009.

The modelling carried out for this exceedance situation has also been used to determine the annual mean NO_X source apportionment for all modelled locations, along with an indicative annual mean NO_2 source apportionment. Table 3 presents summary source apportionment information in this exceedance situation for 2008, including:

- The modelled NO_X and indicative NO_2 source apportionment for the section of road with the highest modelled NO_2 concentration in this exceedance situation in 2008. This is important information because it shows which sources need to be tackled at the point with the largest compliance gap in the exceedance situation. It is not possible to calculate an unambiguous source apportionment for annual mean NO_2 concentrations for the reasons discussed in the UK Technical Report. We have, however, developed a method to provide an indicative source apportionment for annual mean NO_2 concentrations for these air quality plans. This method involves calculating the maximum and minimum possible contribution from each source to the NO_2 concentration. The final source apportionment has been calculated as the average of the minimum and maximum contributions for each source, with the results normalised so that the contributions sum to the total modelled NO_2

concentration. Further information on the methods used for source apportionment are provided in the UK Technical Report.

• The maximum NO_X contribution from each source from across all the roads included in this exceedance situation in 2008. This is important information because it highlights all the key sources that need to be tackled within the exceedance situation in order to achieve compliance across the entire area of the exceedance situation.

Figure A1.1 in Annex 1 presents the annual mean NO_X source apportionment for each section of road within the NO_2_UK0017_Annual_1 exceedance situation (i.e. the source apportionment for all exceeding roads only) in 2008. Roads have been grouped into motorways, trunk roads and primary road in this figure.

Table 1. Measured annual mean concentrations at national network stations in NO_2_UK0017_Annual_1 for 2001 onwards, μgm^{-3}. (Data capture shown in brackets) (a)

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009
Coventry Memorial Park (GB0739A)	19 (64%)	21 (88%)	25 (87%)	22 (98%)	22 (99%)	18 (99%)	19 (99%)	19 (99%)	17 (97%)

(a) Annual Mean Limit Value = 40 μgm^{-3}

Table 2. Annual mean NO_2 model results in NO_2_UK0017_Annual_1 for 2001 onwards

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Road length exceeding (km)	27.0	11.0	28.5	24.2	24.9	20.1	16.5	10.6	15.2
Background area exceeding (km^2)	2	0	0	0	0	0	0	0	0
Maximum modelled concentration (μgm^{-3}) (a)	54.7	44.0	52.7	50.6	52.8	50.7	49.1	51.9	85.4

(a) Annual Mean Limit Value = 40 μgm^{-3}

Table 3. Source apportionment summary information for 2008 in NO_2_UK0017_Annual_1 (μgm^{-3}).

Spatial scale	Component	Highest road link (a)		Maximum (b)
		NOx	NO2 (d)	NOx
Regional background sources (i.e. contributions from distant sources of > 30 km from the receptor)	Total	9.0	(c)	
	From within the UK	5.2	(c)	5.3
	From transboundary sources (includes shipping and other EU Member States)	3.7	(c)	3.7
Urban background sources (i.e. sources located within 0.3 - 30 km from the receptor)	Total	48.8	22.4	-
	From road traffic sources	20.2	14.2	20.2
	From industry (including heat and power generation)	8.6	(c)	11.8
	From agriculture	0.0	(c)	0.0
	From commercial/residential sources	6.7	(c)	8.5
	From shipping	0.0	(c)	0.0
	From off road mobile machinery	12.7	(c)	12.8
	From natural sources	0.0	(c)	0.0
	From transboundary sources	0.0	(c)	0.0
	From other urban background sources	0.6	(c)	1.2
Local sources (i.e. contributions from sources < 0.3 km from the receptor)	Total	72.5	29.5	-
	From cars	34.1	13.3	49.8
	From HGV rigid	7.4	3	17.8
	From HGV articulated	2.0	0.8	14.3
	From Buses	17.2	6.9	17.2
	From LGVs	11.7	5.4	11.7
	From motorcycles	0.1	0	0.2
Total (i.e. regional background + urban background + local components)		130.2	51.9	-

(a) The road with the highest modelled annual mean NO_2 concentration in this exceedance situation in 2008 is a section of the A4053, traffic count point id 47690 (OS grid (m): 433000, 279347).
(b) This column gives the maximum contribution for each component from all the roads included in the exceedence situation.
(c) The combined modelled annual mean NO_2 concentration contribution for these components is 8.3 μgm^{-3}. A more detailed NO_2 source apportionment is currently unavailable for these sectors.
(d) Source apportionment for NO_2 is indicative, see UK Technical Report.

Figure 4. Map of modelled background annual mean NO_2 concentrations 2008. Modelled exceedances of the annual limit value are shown in orange and red.

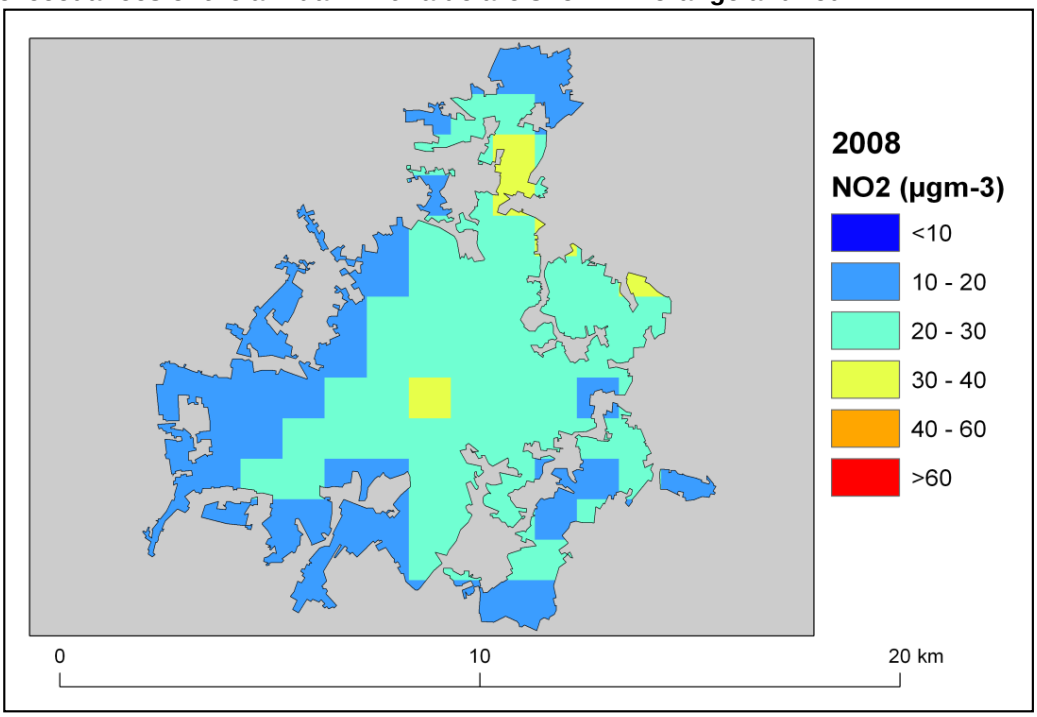
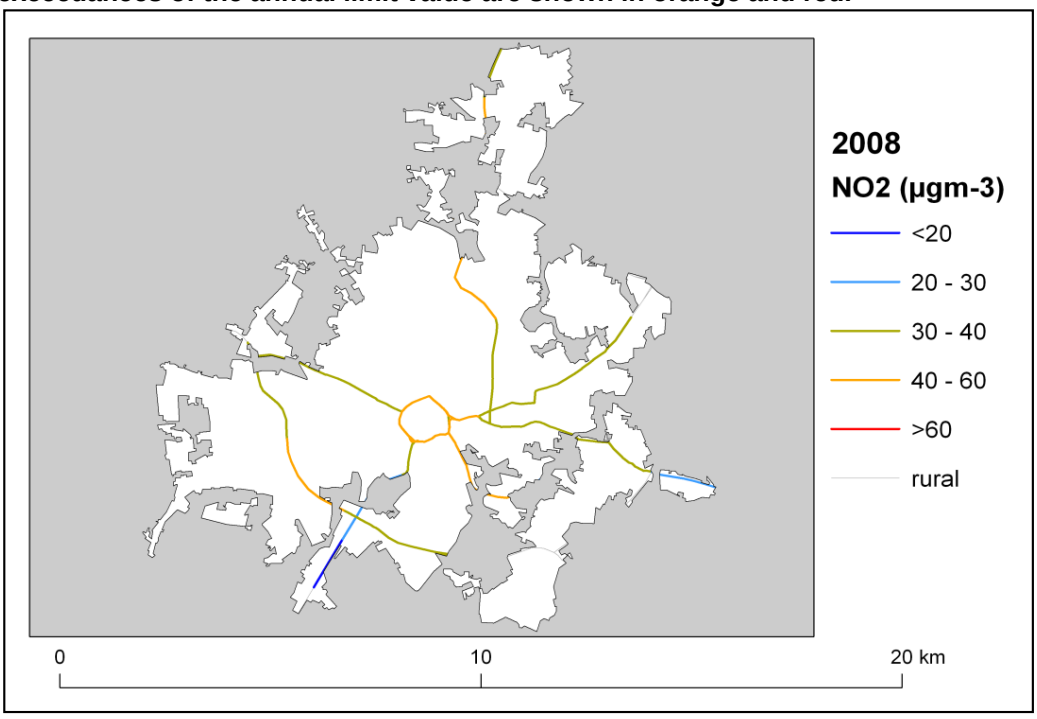


Figure 5. Map of modelled roadside annual mean NO_2 concentrations 2008. Modelled exceedances of the annual limit value are shown in orange and red.



4. Measures

4.1. Introduction

This section (section 4) gives details of measures that address exceedances of the NO_2 limit values within Coventry/Bedworth agglomeration zone. This includes both measures that have already been taken and measures for which there is a firm commitment that they will be taken.

Section 5 then explains the extent to which it has been possible to incorporate the impacts of these measures into the baseline modelling carried out for this assessment.

4.2. Source apportionment

It is important to understand which sources are responsible for causing the exceedance in order to most effectively tailor measures to address the NO_2 exceedance situation(s) described in section 3 above. This can be achieved by considering the source apportionment for the exceedance situation, also presented in section 3. A summary of what the source apportionment shows and the implications for which measures would therefore be appropriate is given here.

Local road traffic was the dominant source in this exceedance location in the reference year. The largest contribution was from cars at the location of maximum exceedance with a contribution of 34.1 ugm^{-3} of NO_X out of a total of 130.2 ugm^{-3} of NO_X. Cars, rigid HGVs and articulated HGVs were important sources on the trunk roads with the highest concentrations. Cars, buses, rigid HGVs and LGVs were important sources on the primary roads with the highest concentrations.

This indicates that appropriate measures should impact on local road traffic sources in this zone. Other measures may also be beneficial depending on the source apportionment for the urban background.

4.3. Measures

Measures potentially affecting NO_2 in this agglomeration zone have been taken and/or are planned at a range of administrative levels. These are:

- European Union
- National (i.e. England, Scotland, Wales, Northern Ireland or whole UK)
- Local (i.e. UK Local Authorities)

Details of European Union measures (e.g. euro standards, fuel quality directives, integrated pollution prevention and control) can be found on the European Commission's website (http://ec.europa.eu/environment/air/index_en.htm). Details of national measures are given in the UK overview document and list of UK and National measures.

Relevant Local Authority measures within this exceedance situation are listed in Table A2.1 (see Annex 2). Relevant Local Authority measures are considered to be those measures which directly target, or are in close geographical proximity to roads and/or background grid squares in exceedance of one or other of the NO_2 limit values. Other Local Authority measures may also have been taken in this zone, but they are not listed in this table. All the measures listed in Table A2.1 have been carried out, are in the process of being carried out or a firm commitment had been made to carry them out on the timetables listed at the point at which information on local measures was collected.

4.4. Measures timescales

Timescales for national measures are given in the UK overview document and list of UK and National measures.

Information on local measures was collected in autumn 2009. Hence, any Local Authority action plans and measures adopted by Local Authorities after this time have not been included in this air quality plan. Many of the measures listed in Annex 2 will either have happened before autumn 2009 or have

been planned for implementation before or during 2010. Others will be planned for after 2010. It should be noted that many of the measures taken before or during 2010 will continue to have a beneficial impact on air quality after the end of 2010.

Local Authorities report on progress with the implementation of their action plans annually and review action plan measures regularly. Where future Local Authority measures to improve air quality are under consideration these would be included in future local authority action plans and published by the local authority.

5. Baseline Model Projections

5.1. Overview of model projections

Baseline projections for 2010
Model projections for 2010, starting from the 2008 reference year described in section 3, have been calculated in order to determine whether compliance with the NO_2 limit values is likely to be achieved for each exceedance situation by the original deadline for compliance of 01/01/2010. Details of the methods used for the baseline emissions and concentration projections modelling are provided in the the UK technical report.

For national measures, it has not been possible to quantify the impact of all measures on emissions and ambient concentrations. The impact for all quantifiable measures has been included in the baseline projections.

The impacts of the individual Local Authority measures have not been explicitly included in the baseline model projections. However, measures may have been included implicitly if they have influenced the traffic counts for 2007 (used as a basis for the compilation of the emission inventory) or in the traffic activity projections to 2010 and beyond (used to calculate the emission projections). It should be recognised that these measures will have a beneficial impact on air quality, even if it has not been possible to quantify this impact here.

A number of the local measures in Table A2.1 can be considered to be 'smarter choices' measures (see http://www.dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt/ for a detailed description of this type of measure). We have quantified the impact of this group of measures on a national scale within the projections. Details of how this has been done can be found in the UK technical report. Table A2.1 indicates which local measures we have considered to be 'smarter choices'.

Baseline projections for 2015
Model projections for 2015, starting from the 2008 reference year described above, have been calculated in order to determine whether compliance with the NO_2 limit values is likely to be achieved for each exceedance situation by the revised deadline for compliance of 01/01/2015 on the basis of EU-wide measures and the measures currently planned. This modelling is described in detail in the UK technical report. Many of the measures listed in annex 2 of this document and the supporting list of UK and national measures will continue or will continue to have an impact beyond the original deadline for compliance of 01/01/2010.

5.2. Baseline projections: NO_2_UK0017_Annual_1

Table 4 presents summary results for the baseline model projections for 2010, 2015 and 2020 for the NO_2_UK0017_Annual_1 exceedance situation. This shows that the maximum modelled annual mean NO_2 concentration predicted for 2010 in this exceedance situation is 43.5 μgm^{-3}. By 2015, the maximum modelled annual mean NO_2 concentration is predicted to drop to 31.8 μgm^{-3}. Hence, the model results suggest that compliance with the NO_2 annual limit value can be achieved by 2015 under baseline conditions in this exceedance situation. Postponement of the compliance date to 2015 is sought for this limit value in this zone.

The projected modelled NO_X and indicative NO_2 annual mean source apportionments for 2010, 2015 and 2020 at the location with the biggest compliance gap in 2008 are presented in Table 5. The model results suggest that this location will continue to have the highest annual mean NO_2 concentration within this exceedance situation in 2010, 2015 and 2020.This source apportionment information is useful because it shows which sources need to be tackled at the point with the largest compliance gap in the exceedance situation.

Table 6 shows the maximum NO_X contribution from each source apportionment component from any road across the whole exceedance situation. This source apportionment information is useful because it highlights all the key sources that need to be tackled within the exceedance situation in order to achieve compliance across the entire area of the exceedance situation. It should be noted that this table only includes roads which continue to be in exceedance in the relevant year. Hence, for

example, the road with the largest contribution from cars in 2010 may no longer be included in the table in 2015 if the road is predicted to be compliant in 2015.

Figures 6 and 7 show maps of projected annual mean NO_2 concentrations in 2010, 2015 and 2020 at background and roadside locations respectively. Maps for 2008 are also presented here for reference.

It should be noted that the baseline projections presented here include the impacts of measures, where they can be quantified, that have already been or will be implemented.

Table 4. Annual mean NO_2 model results in NO_2_UK0017_Annual_1

	2008	2010	2015	2020
Road length exceeding (km)	10.6	1.6	0.0	0.0
Background area exceeding (km^2)	0	0	0	0
Maximum modelled concentration (μgm^{-3}) (a)	51.9	43.5	31.8	22.9

(a) Annual Mean Limit Value = 40 μgm^{-3}

Table 5. Modelled source apportionment for 2010, 2015 and 2020 under baseline conditions for traffic count point 47690 on the A4053 (the road section with the maximum modelled annual mean NO_2 concentration in 2008 in NO_2_UK0017_Annual_1. OS grid (m): 433000, 279347). 2008 results are also presented here for reference (units: μgm^{-3}).

Spatial scale	Component	NOx				NO2 (indicative)			
		2008	2010	2015	2020	2008	2010	2015	2020
Regional background sources (i.e. contributions from distant sources of > 30 km from the receptor)	Total	9.0	7.7	6.7	5.4	(a)	(b)	(c)	(d)
	From within the UK	5.2	4.5	3.9	3.2	(a)	(b)	(c)	(d)
	From transboundary sources (includes shipping and other EU Member States)	3.7	3.2	2.8	2.2	(a)	(b)	(c)	(d)
Urban background sources (i.e. sources located within 0.3 - 30 km from the receptor)	Total	48.8	40.0	29.2	24.1	22.4	19.3	15.6	13.5
	From road traffic sources	20.2	13.2	8.8	6.3	14.2	13.6	11.6	10.5
	From industry (including heat and power generation)	8.6	7.7	7.4	7.0	(a)	(b)	(c)	(d)
	From agriculture	0.0	0.0	0.0	0.0	(a)	(b)	(c)	(d)
	From commercial/residential sources	6.7	6.7	6.2	5.8	(a)	(b)	(c)	(d)
	From shipping	0.0	0.0	0.0	0.0	(a)	(b)	(c)	(d)
	From off road mobile machinery	12.7	11.9	6.3	4.5	(a)	(b)	(c)	(d)
	From natural sources	0.0	0.0	0.0	0.0	(a)	(b)	(c)	(d)
	From transboundary sources	0.0	0.0	0.0	0.0	(a)	(b)	(c)	(d)
	From other urban background sources	0.6	0.5	0.5	0.5	(a)	(b)	(c)	(d)
Local sources (i.e. contributions from sources < 0.3 km from the receptor)	Total	72.5	56.7	35.5	19.7	29.5	24.2	16.2	9.4
	From cars	34.1	22.9	15.8	10.5	13.3	9.5	7.2	5.0
	From HGV rigid	7.4	6.6	3.4	1.2	3.0	2.8	1.5	0.5
	From HGV articulated	2.0	1.7	0.9	0.3	0.8	0.7	0.4	0.1
	From Buses	17.2	15.4	9.1	4.2	6.9	6.4	4.0	1.9
	From LGVs	11.7	10.0	6.3	3.5	5.4	4.8	3.2	1.8
	From motorcycles	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total (i.e. regional background + urban background + local components)		130.2	104.4	71.4	49.3	51.9	43.5	31.8	22.9

(a) The total annual mean NO_2 contribution for all components labelled (a) in 2008 was modelled to be 8.3 μgm^{-3}.
(b) The total annual mean NO_2 contribution for all components labelled (b) in 2010 is predicted to be 5.7 μgm^{-3}.
(c) The total annual mean NO_2 contribution for all components labelled (c) in 2015 is predicted to be 4 μgm^{-3}.
(d) The total annual mean NO_2 contribution for all components labelled (d) in 2020 is predicted to be 3 μgm^{-3}.

Table 6. The maximum NO_X contribution from each source from across all the roads included in the exceedance situation on which exceedances remain in 2010, 2015 and 2020 under baseline conditions. Zeros indicate that there are no exceedances in the relevant year.

Spatial scale	Component	NOx			
		2008	2010	2015	2020
Regional background sources (i.e. contributions from distant sources of > 30 km from the receptor)	From within the UK	5.3	4.5	0.0	0.0
	From transboundary sources (includes shipping and other EU Member States)	3.7	3.2	0.0	0.0
Urban background sources (i.e. sources located within 0.3 - 30 km from the receptor)	From road traffic sources	20.2	13.6	0.0	0.0
	From industry (including heat and power generation)	11.8	7.8	0.0	0.0
	From agriculture	0.0	0.0	0.0	0.0
	From commercial/residential sources	8.5	6.7	0.0	0.0
	From shipping	0.0	0.0	0.0	0.0
	From off road mobile machinery	12.8	11.9	0.0	0.0
	From natural sources	0.0	0.0	0.0	0.0
	From transboundary sources	0.0	0.0	0.0	0.0
	From other urban background sources	1.2	0.6	0.0	0.0
Local sources (i.e. contributions from sources < 0.3 km from the receptor)	From cars	49.8	33.4	0.0	0.0
	From HGV rigid	17.8	12.3	0.0	0.0
	From HGV articulated	14.3	3.2	0.0	0.0
	From Buses	17.2	15.4	0.0	0.0
	From LGVs	11.7	10.0	0.0	0.0
	From motorcycles	0.2	0.1	0.0	0.0

Figure 6. Background baseline projections of annual mean NO_2 concentrations in 2010, 2015 and 2020. 2008 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.

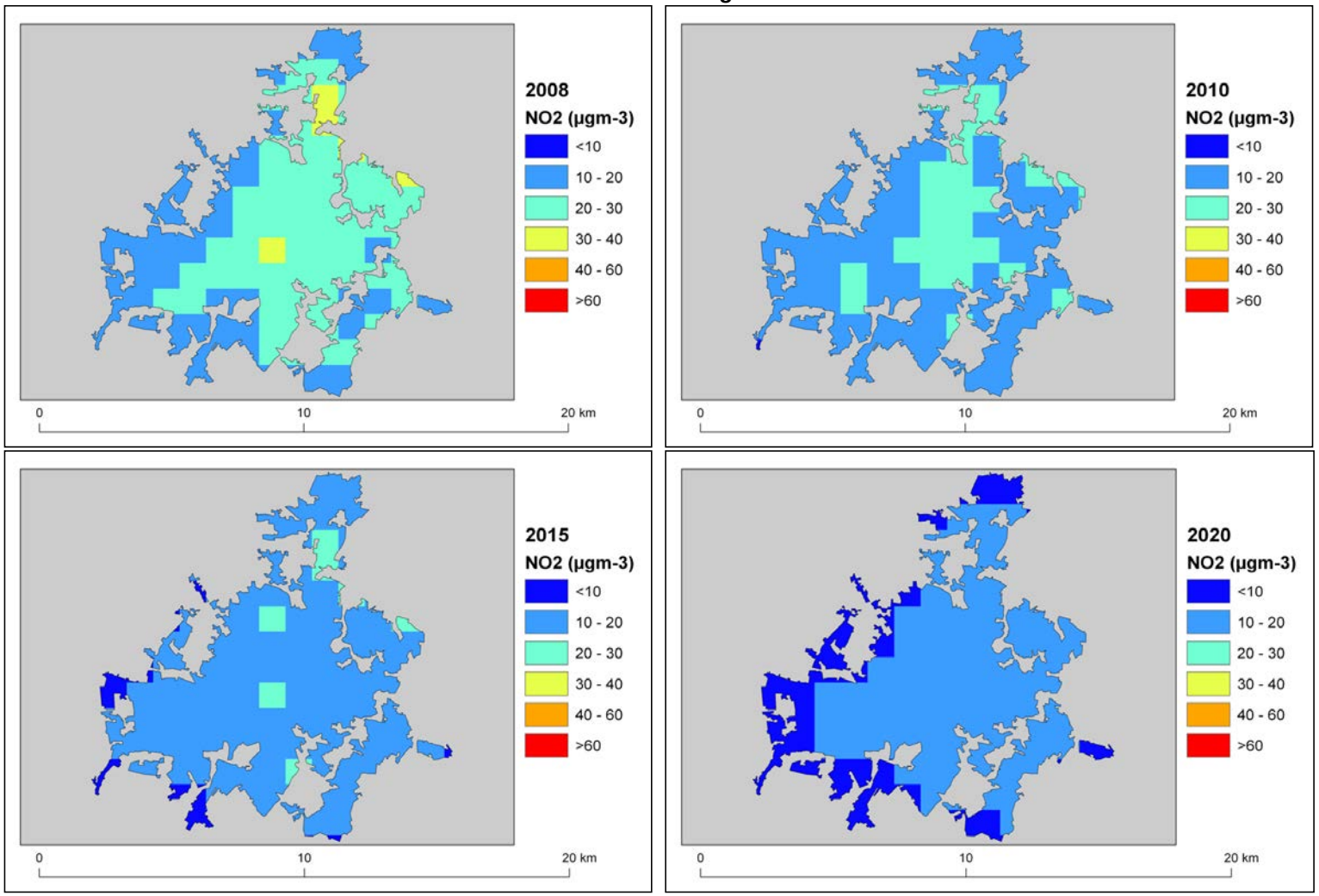
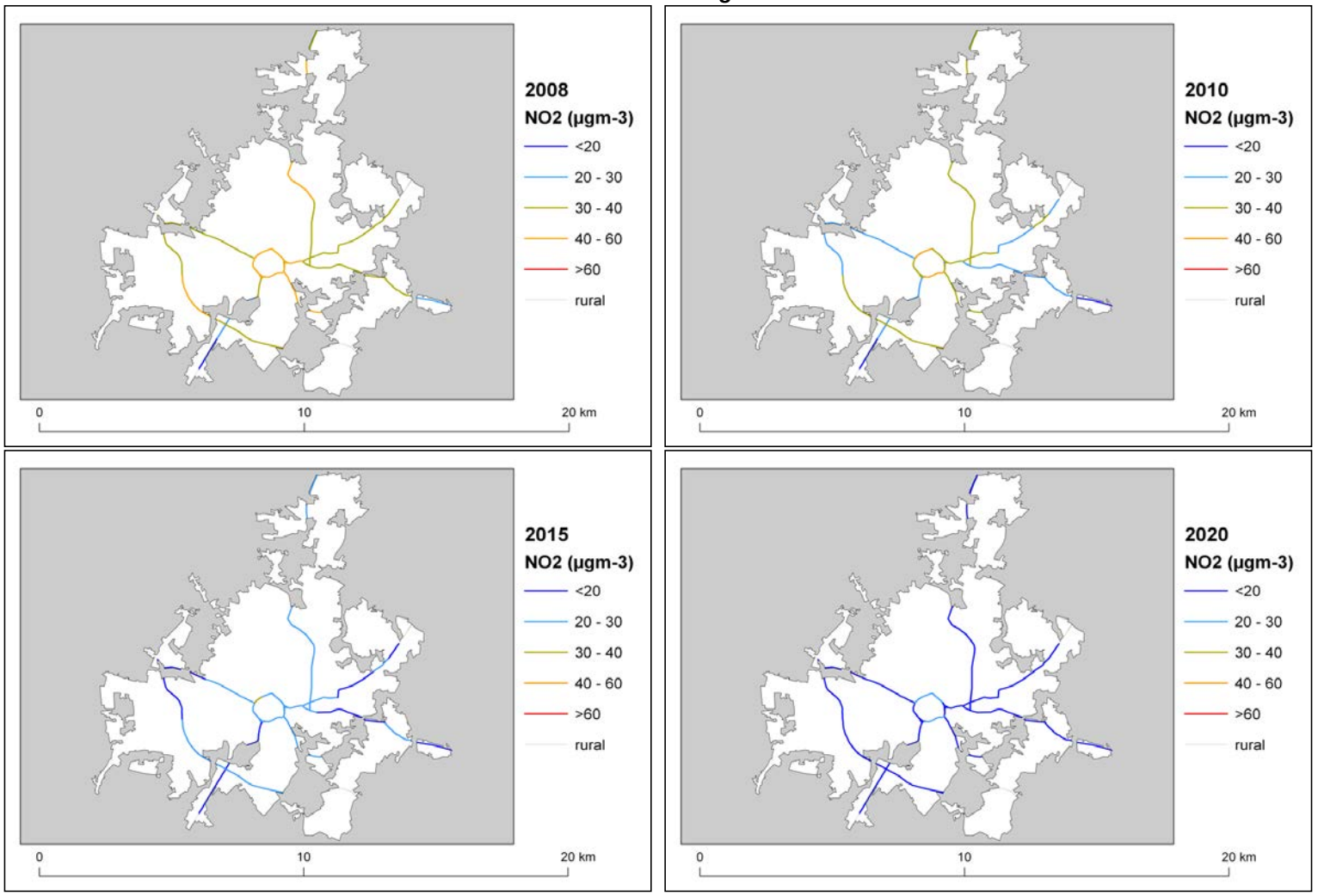


Figure 7. Roadside baseline projections of annual mean NO_2 concentrations in 2010, 2015 and 2020. 2008 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.



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Decision 2004/224/EC. Commission Decision of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air. From the Official Journal of the European Union, 6.3.2004, En series, L68/27

Decision 2004/461/EC. Commission Decision of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council. From the Official Journal of the European Union, 30.4.2004, En series, L 156/78

UK technical report, UK overview document and List of UK and National measures are available at http://www.defra.gov.uk/environment/quality/air/air-quality/eu/

CDR Central Data Repository. http://cdr.eionet.europa.eu/

Air Quality Directive 2008/50/EC. Council Directive 2008/50/EC, of 21 May 2008. On ambient air quality and cleaner air for Europe. From the Official Journal of the European Union, 11.6.2008, En series, L152/1

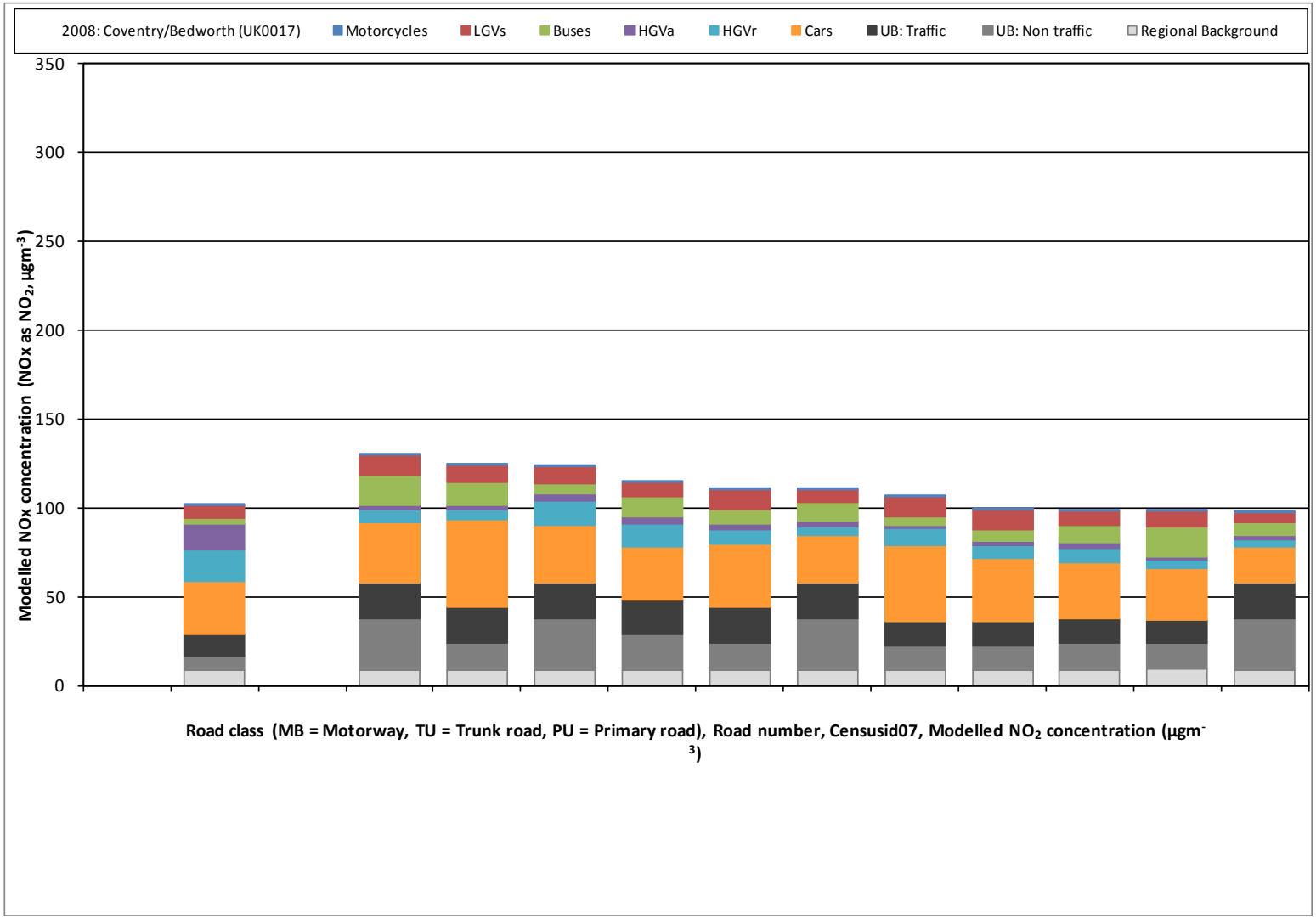
1st Daughter Directive 1999/30/EC. Council Directive 1999/30/EC, of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (The First Daughter Directive). From the Official Journal of the European Communities, 29.6.1999, En Series, L163/41.

List of Annexes

Annex 1: Source apportionment graphs
Annex 2: Tables of measures

Annex 1: Source apportionment graphs

Figure A1.1 Annual mean roadside NO_X source apportionment plots for all roads exceeding the annual mean NO_2 limit value in 2008



Annex 2: Tables of measures

Table A2.1 Relevant Local Authority measures taken before or during 2010 within Coventry/Bedworth (UK0017)

LA (a)	Measure code (b)	Title	Description	Other information
Coventry	Local_Coventry_B1	Continue domestic energy efficiency programme	CCC will continue to enforce the provisions of the Clean Air Act 1993 as applied to stack height provision and dark smoke offences	• Type: Education/information • Sources affected: Commercial and residential sources • Spatial scale: local • Implementation date: 2006 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_B2	Develop an energy efficiency strategy for own buildings	Housing and Policy Services to continue its programme of energy efficiency improvements in the domestic sector. CCC (City Development Directorate) are to develop an energy strategy	• Type: Education/information • Sources affected: Commercial and residential sources • Spatial scale: local • Implementation date: 2006 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_H1	Commitment to various targets through ISO 14001 for the Public Protection Division	CCC has adopted ISO14001 within its Public Protection Division with commitments to the following: • Investigate and compile an action plan to minimise our use of energy • Investigate the feasibility of reducing emissions from private vehicles for commuting • Reduce the air emissions from City Council vehicles by 5% from the 2005 baseline by the end of 2007 • Reduce air emissions from the use of grounds maintenance vehicles by 10% from a 2005 baseline by the end of 2007 • Reduce air emissions from the use of grass/hedge trimmers by 10% from 2005 baseline by the end of 2007 • Investigate the feasibility of reducing air emissions from the cremation of cadavers	• Type: Other • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_G1	Continue to promote cycling	CCC will continue to promote cycling as a lower polluting means of transport including new cycle lanes as part of the National Cycle Network and the local cycle network, and cycle parking	• Type: Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : Yes

LA (a)	Measure code (b)	Title	Description	Other information
				• Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_G2	Continue to promote walking	CCC will continue to promote walking as a lower polluting means of transport.	• Type: Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : Yes • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_A1	Improve council fleet	Currently fleet management is undertaken across the council. It is suggested that through procurement, emissions are taken into consideration on purchase.	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_B3	Continue use of electric vehicles	CCC will continue to pursue the current research and development projects aimed at encouraging low emission vehicles.	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_A2	Bus operators will continue to clean fleets	The bus operators will continue modernisation of the bus fleets with low emission vehicles. The introduction of increasingly stringent European emissions standards mean that new buses are increasingly cleaner. This can be encouraged through voluntary schemes, or implemented through Bus Quality Partnerships for the commercial bus services.	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E1	Continue strategy of encouraging city centre living and mixed use developments	CCC's development plan policy states that mitigation measures will be secured through emphasis on sustainable developments and through mitigation measures secured through planning obligations and or conditions.	• Type: Other • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1

LA (a)	Measure code (b)	Title	Description	Other information
Coventry	Local_Coventry_D1	On-street parking enforcement	Decriminalised parking powers will be used by CCC to reduce illegal parking which restricts traffic flows	• Type: Economic/fiscal; Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_D2	Revised parking arrangements	Revised layouts will be implemented by CCC to restrict the potential for obstructive parking	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_D3	Review off-street parking charges	CCC will review off street parking tariffs in the Ball Hill area	• Type: Economic/fiscal; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E2	Continue general highway improvements	Traffic management schemes will be undertaken by CCC to deliver minor highway improvement works such as road markings, sign and junction improvements.	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E3	Junction improvements in AQMAs	CCC are to propose the restriction of some turning movements on Clay Lane / Brays Lane to ease traffic flows and reduce delays and congestion. CCC will investigate junction improvement to reduce congestion and emissions	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E4	Coventry Station	A transport hub at the station has been an aspiration since the Coventry Development Plan 2001. The hub	• Type: Technical • Sources affected: Transport

LA (a)	Measure code (b)	Title	Description	Other information
		transport hub	forms part of the comprehensive redevelopment of the station area.	• Spatial scale: local • Implementation date: 2007 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_F1	Raise awareness of AQ issues through newsletters and displays	CCC will continue to raise awareness of Air Quality through the Light-Art-Installation on the top of Coventry Point. CCC will continue to raise public awareness of air pollution through newsletters and displays around the city.	• Type: Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : Yes • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_F2	Provide teaching package for Key Stage 3 on AQ and Coventry	CCC will provide education on sustainability to schools in Coventry. This can cover air pollution issues, as well as providing info about the cities' environment as a whole	• Type: Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E5	Showcase bus routes	CCC is investing heavily in the development of 7 bus showcase corridors across the city in order to increase modal shift to public transport. Improvements include new shelters, buses, bus lanes and real time information at bus stops	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2004 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_D4	Bus lane enforcement	CCC will use parking attendants (Phase 1) to enforce parking in bus lanes and then CCTV (phase 2) to enforce bus lane usage and parking	• Type: Economic/fiscal; Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2004 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_A4	Investigation of taxi fleet improvements	CCC are implementing ongoing work in improving the taxi fleet through the licensing regime	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007

LA (a)	Measure code (b)	Title	Description	Other information
				• Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E6	P&R site investigation	CCC is examining two park and ride schemes in the east and west of the city	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2008 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_A3	Red routes (no stopping)	CCC will be developing a network of strategic red routes (no stopping) as part of the prime lines project	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2005 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_G3	Reconfigure Pool Meadow bus station	Greater use of Pool Meadow Bus Station by creating a two-way bus and bicycle only route across the currently pedestrianised areas under the Frank Whittle Arch between Hale Street and Fairfax Street. This will reduce the number of stops and buses in Burges	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_H2	Consider changing taxi rank location in AQMA 1 as part of access study	CCC will consider changing the location of taxi ranks as part of the review of access into this area of the city centre for both public transport and private vehicles	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E7	Continue route resigning	Review of strategic routing into/ out of city centre	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Medium term • Regulatory: No

LA (a)	Measure code (b)	Title	Description	Other information
				• Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_F3	VMS to promote PT and non-polluting modes to motorists	CCC will use VMS to show a comparison of bus speeds against traffic speeds and also real time air quality information to help persuade people to use public transport and alternative routes.	• Type: Technical; Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : Yes • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E8	Review of strategic routes in/out city	Review of strategic routing into/ out of city centre	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Medium term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_E9	Integrated traffic control system	Improved signalisation of the junction will be implemented to ease the passage of vehicles and reduce delay and congestion	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Long term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_H3	Feasibility study into long-terms options for cutting congestion	Draft report published September 2006 on potential options. Further investigation to be carried out and drawn together.	• Type: Technical • Sources affected: Transport • Spatial scale: local • Implementation date: 2006 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : No • Reference (d): Local_zone17_Coventry_AQActionplan_1
Coventry	Local_Coventry_G4	Travel Plans	CCC will continue to require green travel plans with all major planning applications as well as continue to work with schools on school-based travel plans. CCC will continue to invest in encouraging employees in the city to use more sustainable forms of travel to get to school and back, through safer routes for walking and cycling	• Type: Education/information • Sources affected: Transport • Spatial scale: local • Implementation date: 2007 • Reduction timescale: Short term • Regulatory: No • Smarter Choices (c) : Yes • Reference (d): Local_zone17_Coventry_AQActionplan_1

(a) Name of responsible Local Authority.
(b) The Letter in the measure code indicates the main source sector that will be affected by the measure. Letters are assigned as follows: A - measures to reduce emissions from mobile sources, B - measures to reduce emissions from stationary sources, C - fuels and petrol stations, D - Economic incentives to reduce emissions (e.g. congestion charging, controlled parking zones), E - measures related to traffic planning/redesigning infrastructure, F - information/educational measures, G - change of transport mode (e.g. scheme to encourage people out of cars and onto bikes), H - Other.
(c) Measures have been classified as 'smarter choices' or not based on expert judgement
(d) References available for download from: http://uk-air.defra.gov.uk/library/NO_2ten/