

**Warwick District Council**

**Local Air Quality Management:**  
**Working Document (Draft Action Plan)**

**May 2007**

## CONTENTS

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
1.1	<i>Project Background.....</i>	<i>1</i>
1.2	<i>Legislative Background.....</i>	<i>3</i>
<b>2</b>	<b>Overview of Air Quality in Warwick District Council.....</b>	<b>4</b>
2.1	<i>Air Quality Management Areas.....</i>	<i>4</i>
2.2	<i>Source Apportionment and NOx Reduction.....</i>	<i>5</i>
2.3	<i>Monitoring Network.....</i>	<i>5</i>
2.3.1	<i>Continuous Monitoring Stations.....</i>	<i>5</i>
2.3.2	<i>NO<sub>2</sub> Diffusion Tubes.....</i>	<i>7</i>
<b>3</b>	<b>Existing Policies and Strategies to Improve Air Quality.....</b>	<b>10</b>
3.1	<i>Warwick District Local Plan.....</i>	<i>10</i>
3.2	<i>Warwickshire’s Local Transport Plan (2006 – 2011).....</i>	<i>11</i>
3.3	<i>Warwickshire Air Quality Strategy.....</i>	<i>11</i>
3.4	<i>Warwickshire Structure Plan (WASP).....</i>	<i>13</i>
3.5	<i>West Midlands Regional Assembly – Regional Spatial Strategy (RSS).....</i>	<i>14</i>
3.6	<i>West Midlands Regional Assembly – Regional Transport Strategy (RTS).....</i>	<i>14</i>
3.7	<i>Transport Delivery Plan (TDP).....</i>	<i>15</i>
3.8	<i>Regional Sustainable Development Framework.....</i>	<i>15</i>
3.9	<i>Warwickshire County Council Green Travel Plan.....</i>	<i>16</i>
<b>4</b>	<b>Financing.....</b>	<b>17</b>
<b>5</b>	<b>Consultation.....</b>	<b>18</b>
<b>6</b>	<b>Proposed Measures.....</b>	<b>19</b>
6.1	<i>Proposed Direct Measures for Existing AQMAs.....</i>	<i>19</i>
6.1.1	<i>Theme A1 – Reduction in Traffic Flows.....</i>	<i>19</i>
6.1.2	<i>Theme A2 – Reduction in Pollutant Emissions.....</i>	<i>21</i>
6.1.3	<i>Theme A3 – Encouragement of Public Transport Uptake.....</i>	<i>21</i>
6.2	<i>Proposed Indirect Measures to Improve Air Quality across Warwick District Council.....</i>	<i>23</i>
6.2.1	<i>Theme B1 – Reduction of the need to travel by car.....</i>	<i>23</i>
6.2.2	<i>Theme B2 – Reduction of background concentrations.....</i>	<i>24</i>
<b>7</b>	<b>Scenario Testing.....</b>	<b>27</b>
7.1	<i>Traffic Flows – High Street, Warwick.....</i>	<i>27</i>

<b>8</b>	<b>Implementation and Monitoring</b> .....	<b>30</b>
<b>9</b>	<b>Glossary of terms</b> .....	<b>31</b>
<b>10</b>	<b>References</b> .....	<b>31</b>

#### LIST OF TABLES

<b>Table 2.1</b>	<b>Summary of Air Quality Review and Assessment for Warwick District Council</b> .....	<b>4</b>
<b>Table 2.2</b>	<b>Minimum NO<sub>x</sub> and NO<sub>2</sub> Reduction required in 2005 based on Modelled (Verified) Data</b> .....	<b>5</b>
<b>Table 2.3</b>	<b>Continuous Monitoring Results (2006)</b> .....	<b>6</b>
<b>Table 2.4</b>	<b>Bias Adjustment Factors for Co-Located Diffusion Tubes (2006)</b> .....	<b>7</b>
<b>Table 2.5</b>	<b>NO<sub>2</sub> Diffusion Tube Results (2006)</b> .....	<b>8</b>
<b>Table 3.1</b>	<b>Air Quality Strategy – Targets and Indicators</b> .....	<b>12</b>
<b>Table 6.1</b>	<b>Action Plan of Direct Measures Proposed for the AQMA</b> .....	<b>24</b>
<b>Table 6.2</b>	<b>Action Plan of Indirect Measures to Improve Air Quality</b> .....	<b>26</b>
<b>Table 7.1</b>	<b>Predicted NO<sub>x</sub>/NO<sub>2</sub> based on Reduction AADT</b> .....	<b>27</b>

#### LIST OF FIGURES

<b>Figure 1.1</b>	<b>The Air Quality Strategy and other LTP Strategies</b> .....	<b>2</b>
<b>Figure 7.1</b>	<b>Diurnal Traffic Profile along High Street, Warwick</b> .....	<b>29</b>

#### LIST OF ACTIONS

<b>Action 1:</b>	<b>Highway Improvements and Traffic Management Measures</b> .....	<b>19</b>
<b>Action 2:</b>	<b>Leamington Urban Mixed Priority Scheme</b> .....	<b>20</b>
<b>Action 3:</b>	<b>Cycling Improvements</b> .....	<b>20</b>
<b>Action 4:</b>	<b>Powered Two Wheeler (PTW) Strategy</b> .....	<b>20</b>
<b>Action 5:</b>	<b>Intelligent Transport Systems (ITS) Strategy</b> .....	<b>21</b>
<b>Action 6:</b>	<b>Improving the Attractiveness of Public Transport</b> .....	<b>21</b>
<b>Action 7:</b>	<b>Public Transport Interchange Strategy</b> .....	<b>21</b>
<b>Action 7:</b>	<b>Bus Strategy</b> .....	<b>22</b>
<b>Action 9:</b>	<b>Bus Information Strategy</b> .....	<b>22</b>
<b>Action 10:</b>	<b>Passenger Rail Strategy</b> .....	<b>22</b>

**Action 11: Parking Strategy..... 23**  
**Action 12: Changing Travel Behaviour Strategy ..... 23**  
**Action 13: Cycling Strategy ..... 23**  
**Action 14: Safer Routes to School Strategy ..... 23**  
**Action 15: Land Use and Transportation Strategy..... 24**  
**Action 16: Sustainable Freight Distribution Strategy ..... 24**  
**Action 17: Local Air Quality Management and Pollution Control ..... 24**

## Executive Summary

This Air Quality Action Plan is the culmination of the second round of local air quality review and assessment for Warwick District Council (WDC). The process of Local Air Quality Management (LAQM) review and assessment has been set down in Part IV of the Environment Act 1995, which forms part of the Government's response to European Directives on Air Quality to which the UK Air Quality Strategy responds.

Following the Detailed Assessment in 2004 and the Department for Environment, Food and Rural Affairs (DEFRA) acceptance of the findings of the report, WDC declared AQMAs in Leamington Spa, Warwick and Barford. As such, the aim of this Action Plan is to identify how Warwick District Council will use its existing powers and work together with other organisations in pursuit of the annual mean Air Quality Objective for nitrogen dioxide. Measures are proposed to improve air quality both within the AQMAs and across the District as a whole.

Warwickshire County Council (WCC) is responsible for the management of the local road network and as such is responsible for any direct actions proposed for the AQMAs in order to reduce road traffic emissions. Warwick District Council will work together with the County Council to improve air quality within the AQMAs and throughout the District.

The direct measures proposed (or undertaken) within the AQMAs are:

- Construction of the Barford bypass
- Improving effectiveness of public transport (SPARK), including possible establishment of Park & Ride schemes
- Establishment of a demonstration Urban Mixed Priority Route scheme in Leamington Spa
- Improve the local urban cycle network, including National Cycle Network routes proposed by Sustrans
- Development of Intelligent Transport Systems (ITS), including car park management systems and Variable Message Signing
- Improve and promote bus services
- Improve and promote passenger rail services
- Sustainable Parking Strategy
- Powered Two Wheeler (PTW) Strategy

The indirect measures to improve air quality across the whole District are:

- Changing travel behaviour by working with the County Council by encouraging, for example, "Walk to School"
- Decrease the number of "utility" journeys made by car by encouraging walking and cycling
- Encourage new development in Warwickshire to be sustainable and the use of public transport, walking and cycling over personal car use
- Support of improvements to Junctions 13, 14 and 15 on the M40 where existing levels of traffic can affect travel habits and route choice.
- WDC to continue their commitment to local air quality monitoring

The proposed actions will help work towards the NO<sub>2</sub> annual mean objective.

It was not possible to assess the air quality impacts of all the measures to improve air quality within this Plan, through detailed modelling, so additional benefits beyond those

assessed may be achieved. A qualitative assessment of impacts of all measures has been included in the action plan summary tables by way of indication of potential benefits. The impacts of measures will be further considered through future progress reports.

# **1 Introduction**

## **1.1 Project Background**

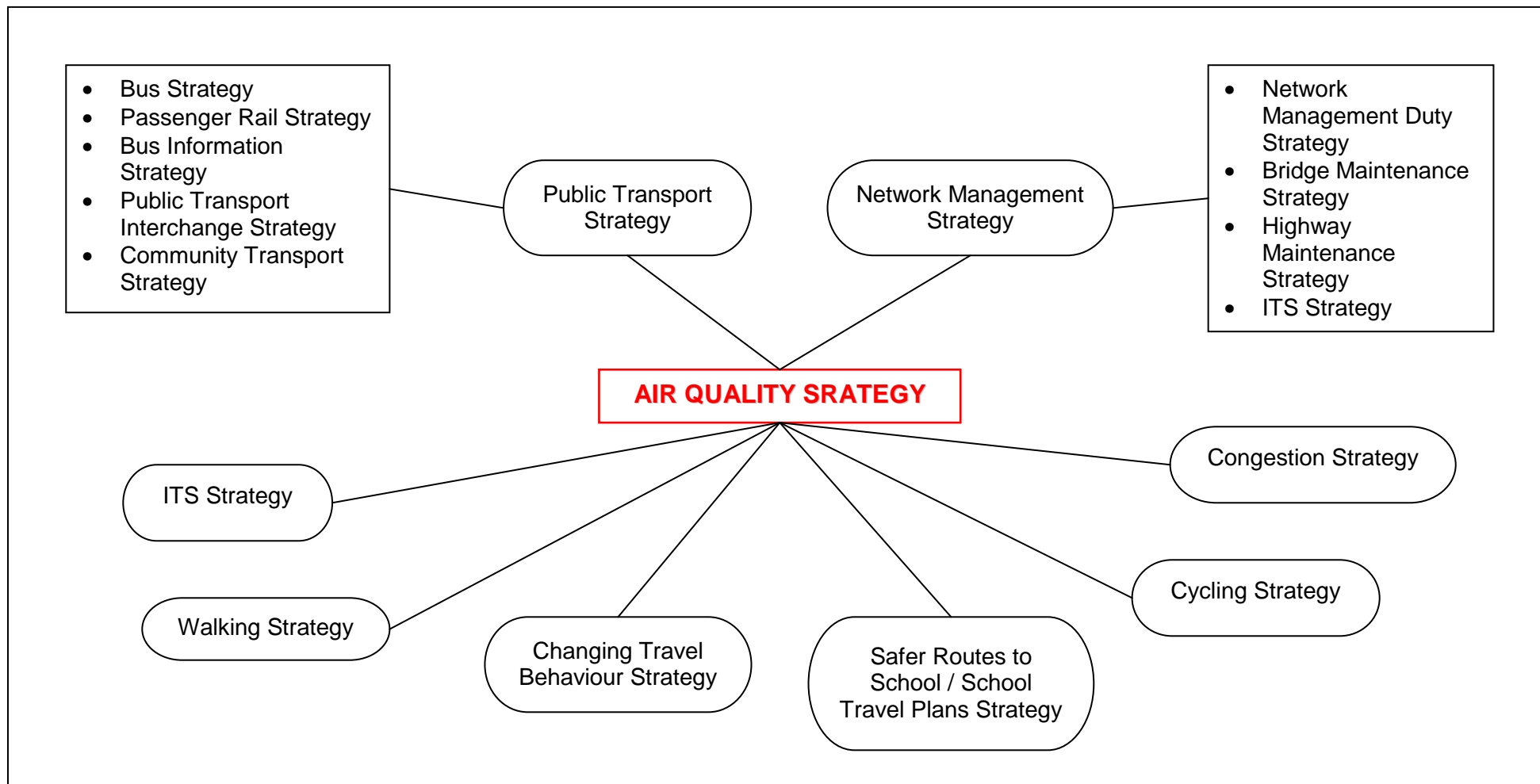
A working document relating ultimately to the completion of a Local Air Quality Management Action Plan for Leamington Spa and Warwick town centres has been devised. Consideration of the declared AQMA within Barford will also be made but in the context of the Barford bypass that is currently under construction.

This working document will review current measures undertaken by the Warwick District Council to tackle air quality, as well as a review of proposed measures, including those detailed within Warwickshire County Councils second local transport plan (LTP2) and local Air Quality Strategy. Clearly, the aims of the working document (and ultimately the Action Plan) will be to describe those measures and indicate how they may translate to achieving delivery of the Air Quality Strategy contained within the LTP2 and its five key areas for action. These are as follows:

1. Improving poor air quality through partnership working
2. Maintaining areas of good air quality
3. Education and information
4. Strategy review
5. Integration of air quality and transport planning goals

An Action Plan is required to be undertaken as part of the local authority's statutory duties as defined within Part IV of the Environment Act, 1995. Figure 1.1 illustrates the linkages between the Air Quality Strategy and other LTP strategies.

Figure 1.1 The Air Quality Strategy and other LTP Strategies



## 1.2 Legislative Background

Part IV of the Environment Act, 1995, places a statutory duty on local authorities to periodically review and assess the air quality within their area. This involves consideration of present and likely future air quality against air quality standards and objectives. Guidelines for the 'Review and Assessment' of local air quality were published in the 1997 National Air Quality Strategy (NAQS)<sup>1</sup> and associated guidance and technical guidance. In 2000, Government reviewed the NAQS and set down a revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland<sup>2</sup> (AQS). The Air Quality Strategy (AQS) along with its addendum<sup>3</sup> contains national air quality standards and objectives established by the Government to protect human health and set by Regulation<sup>456</sup>.

Where it appears that the air quality objectives will not be met by the designated target dates local authorities must declare an Air Quality Management Area (AQMA) and develop action plans in pursuit of the air quality objectives. Following declaration, Warwick District Council is required to develop an Action Plan for the AQMA within 12 – 18 months.

Policy Guidance LAQM.PG(03) was published by the Government in 2003, which included guidance on the development of action plans. The NSCA have published guidance 'Air Quality Action Plans (2000)' and 'Air Quality: Planning for Action (2001)'. These guidance documents have been taken into account in development of this Action Plan for WDC, alongside guidance provided by the Department for Environment, Food and Rural Affairs through its Air Quality Action Plan Help Desk, which provides examples of best practice and an Action Plan appraisal checklist.

---

<sup>1</sup> DoE (1997) The United Kingdom Nation Air Quality Strategy The Stationery Office

<sup>2</sup> DETR (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working together for Clean Air, The Stationery Office

<sup>3</sup> Defra (2002) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum, The Stationery Office

<sup>4</sup> DETR (2000) The Air Quality Regulations 2000, The Stationery Office

<sup>5</sup> Defra (2002) The Air Quality Regulations 2002, The Stationery Office

<sup>6</sup> Defra (2007), The Air Quality Standard Regulations 2007

## 2 Overview of Air Quality in Warwick District Council

The main sources of air pollution in Warwick and Leamington Spa are road traffic emissions. A summary of Warwick District Councils review and assessment of air quality (second round) is summarised briefly in Table 2.1.

**Table 2.1 Summary of Air Quality Review and Assessment for Warwick District Council**

USA (2003)	Detailed Assessment (2004)	Progress Report (2005)	Further Assessment (2006)
NO <sub>2</sub>	<p>Confirmed annual mean NO<sub>2</sub> concentrations were expected to exceed the AQS objective in each of the assessment areas.</p> <p>AQMAs declared in 2004 in Leamington Spa, Warwick and Barford</p>	<p>Recommended that the study area for the Further Assessment be increased to consider additional areas of monitored exceedences and re-assess the boundary of the existing AQMAs</p>	<p>Confirmed the AQMA in Warwick town centre requires extension to encompass roadside properties along Saltisford, Theatre Street, Bowling Green Street, West Street, St Nicholas Church Street, Smith Street and The Butts.</p> <p>The existing AQMA in Leamington Spa is required to be retained</p> <p>The Barford AQMA was not modelled due to the construction of a bypass (see Section 2.1)</p>
PM <sub>10</sub>	No Detailed Assessment required	<p>No exceedences of the PM<sub>10</sub> objective, although it is still a pollutant of some concern in the County.</p> <p>The remaining pollutants are not considered to be a concern within WDC</p>	No Further Assessment required
CO			
Benzene			
1,3 Butadiene			
Lead			
SO <sub>2</sub>			

### 2.1 Air Quality Management Areas

Following the Detailed Assessment in 2004 and the Department for Environment, Food and Rural Affairs (DEFRA) acceptance of the findings of the report, WDC declared AQMAs in Leamington Spa, Warwick and Barford.

Following declaration of the AQMAs, a Further Assessment of the AQMA in Barford was not carried out due to construction of a bypass. Given that the Barford AQMA was declared on the basis of road traffic sources, it was considered likely the annual mean NO<sub>2</sub> concentrations within Barford would decrease following completion of the bypass such that the annual mean objective would not be exceeded and the AQMA could be revoked.

In addition, following recommendations in the Progress Report 2005 to undertake additional diffusion tube monitoring in Kenilworth, based on subsequent exceedences of the annual mean objective at two monitoring locations, a Detailed Assessment of air quality in Kenilworth is to be undertaken. This draft Action Plan should be reviewed following the outcome of this Detailed Assessment.

## 2.2 Source Apportionment and NO<sub>x</sub> Reduction

As part of the Further Assessment (2006), it was identified as part of the source apportionment work that for both the Warwick and Leamington Spa AQMAs, emissions from HGV traffic were significant, despite making up a relatively small proportion of the vehicle fleet. Along those streets in Warwick and Leamington Spa where predicted NO<sub>x</sub> concentrations are highest, the contribution from HGV traffic is highest (42.2%) along the High Street (junction with Wise Street) in Leamington Spa. This compares with 24.4% for LDV and 33.8% for background at the same location. The highest NO<sub>x</sub> contribution from HGV traffic in Warwick (26.3%) occurs along High Street (Jury Street), compared with 38.8% for LDV and 40.2% for background in the same location. A table presenting the source apportionment work carried out as part of the Further Assessment is provided in Appendix A.

The Further Assessment has also considered the NO<sub>2</sub> reduction (as NO<sub>x</sub>) required at the worst case receptors. These are detailed in Table 2.2. Within the Warwick AQMA, a minimum reduction of 27.7% in NO<sub>x</sub> is required. For the Leamington Spa AQMA, a minimum reduction of 33.9% in NO<sub>x</sub> is required.

**Table 2.2 Minimum NO<sub>x</sub> and NO<sub>2</sub> Reduction required in 2005 based on Modelled (Verified) Data**

Receptor Name	Predicted NO <sub>x</sub> 2005	NO <sub>x</sub> (equivalent to 40µg/m <sup>3</sup> NO <sub>2</sub> ) µg/m <sup>3</sup>	Reduction required		Predicted NO <sub>2</sub> 2005	NO <sub>2</sub> AQS objective µg/m <sup>3</sup>	Reduction required	
			µg/m <sup>3</sup>	%			µg/m <sup>3</sup>	%
Jury Street	106.4	76.9	29.5	27.7%	48.4	40.0	8.4	17.4%
Wise St	116.3	76.9	39.4	33.9%	51.3	40.0	11.3	22.0%

## 2.3 Monitoring Network

The monitoring network operated by Warwick District Council in 2006 consisted of two continuous NO<sub>x</sub>/NO<sub>2</sub> monitoring stations, including one AURN monitoring station (NO<sub>x</sub>/NO<sub>2</sub>, PM<sub>10</sub>, CO, O<sub>3</sub> and SO<sub>2</sub>), and 36 NO<sub>2</sub> diffusion tubes. Both continuous monitoring stations are operated and maintained by Warwick District Council.

The monitoring results from these sites are discussed and summarised in the following sections.

### 2.3.1 Continuous Monitoring Stations

Warwick District Council operates a continuous monitoring station installed at Pageant House, Jury Street, Warwick. The monitor was previously located at the junction between

High Street and Clemens Street, Leamington Spa, until April 2005. A summary of the data collected at this monitoring station is provided in Table 2.3. Table 2.3 also provides a summary of the data collected from the AURN monitoring station adjacent to Hamilton Terrace, Leamington Spa.

Continuous monitoring at Pageant House, Jury Street indicates an exceedence of the annual mean NO<sub>2</sub> objective in 2005. This continuous monitoring station is located within the current AQMA along Jury Street, Warwick.

The continuous AURN monitoring station at the rear of 10 Hamilton Terrace in Leamington Spa is classified as an urban background site. As such, measured concentrations in 2006 are significantly lower than the relevant AQS objectives for NO<sub>2</sub> and PM<sub>10</sub>.

**Table 2.3 Continuous Monitoring Results (2006)**

		<b>Hamilton Terrace</b>	<b>Pageant House</b>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Mean (µg/m <sup>3</sup> ) <sup>(a)</sup>	20.1	55.9
	Hourly mean > 200 µg/m <sup>3</sup> <sup>(b)</sup>	0	14
	Capture Rate	72.8	98.7
Particulates (PM <sub>10</sub> )	Annual Mean (µg/m <sup>3</sup> ) <sup>(c)</sup>	24.0	--
	24 hourly mean > 50 µg/m <sup>3</sup> <sup>(d)</sup>	10	--
	Capture Rate (%)	98.7	--
Sulphur Dioxide (SO <sub>2</sub> )	15-minute mean > 266 µg/m <sup>3</sup> <sup>(e)</sup>	0	--
	Hourly mean > 350 µg/m <sup>3</sup> <sup>(f)</sup>	0	--
	Daily mean > 125 µg/m <sup>3</sup> <sup>(g)</sup>	0	--
	Capture Rate (%)	87.0	--
Carbon Monoxide (CO)	Maximum Running 8 Hour Mean (mg/m <sup>3</sup> ) <sup>(h)</sup>	1.7	--
	Capture Rate (%)	98.7	--
Ozone (O <sub>3</sub> )	Annual mean of daily maximum 8-hour (µg/m <sup>3</sup> ) <sup>(i)</sup>	65	--
	Daily maximum 8-hour running mean > 100 µg/m <sup>3</sup> <sup>(j)</sup>	32	--
	Capture Rate (%)	98.4	--
(a) Annual mean objective 40 µg/m <sup>3</sup>		(f) Not to be exceeded on more than 24 occasions	
(b) Not to be exceeded on more than 18 occasions		(g) Not to be exceeded on more than 3 occasions	
(c) Annual mean objective 50 µg/m <sup>3</sup>		(h) Max running 8 hour mean 10 mg/m <sup>3</sup>	
(d) Not to be exceeded on more than 35 occasions		(i) 8 hour mean objective 100 µg/m <sup>3</sup>	
(e) Not to be exceeded on more than 35 occasions		(j) Not to be exceeded on more than 10 occasions	

### 2.3.2 NO<sub>2</sub> Diffusion Tubes

Warwick District Council has currently established 36 NO<sub>2</sub> diffusion tubes throughout the District. Details relating to the current set of diffusion tubes are provided in Table 2.5, with bias adjustment calculations provided in Table 2.4. Bias adjustment factors have been calculated based on co-located diffusion tubes at the Hamilton Terrace AURN site (Leamington Spa) and the Pageant House (Warwick) continuous monitoring stations.

**Table 2.4 Bias Adjustment Factors for Co-Located Diffusion Tubes (2006)**

Diffusion Tube	Unadjusted Mean [A]	Automatic Mean [B]	Bias	Bias Adjustment [B/A]
Hamilton Terrace 1	23.8	20.1 <sup>(a)</sup>	16.6% <sup>(b)</sup>	0.83 <sup>(b)</sup>
Hamilton Terrace 2	23.6			
Hamilton Terrace 3	25.0			
Pageant House 1	54.8	55.9	0.4% <sup>(c)</sup>	0.99 <sup>(c)</sup>
Pageant House 2	56.4			
Pageant House 3	56.9			
Average				0.91
(a) The capture rate for this monitoring station was less than 75% for 2006				
(b) Based on the average of Hamilton Terrace 1, 2 and 3 diffusion tube results (24.1 µg/m <sup>3</sup> )				
(c) Based on the average of Pageant House 1, 2 and 3 diffusion tube results (56.1 µg/m <sup>3</sup> )				

The bias adjustment derived from the Hamilton Terrace continuous monitoring station has been discounted due to the low capture rate from the site for 2006. Furthermore, the bias adjustment derived from the Pageant House continuous analyser (0.99) is consistent with the national average (0.98) taken from the Review and Assessment Helpdesk spreadsheet for bias adjustment factors for co-located studies using Gradko diffusion tubes and the 20% TEA in water methodology<sup>7</sup>. As such, all diffusion tubes located throughout Warwick District Council have been bias adjusted using a factor of 0.99. The NO<sub>2</sub> diffusion tube results for 2006 are provided in Table 2.5.

<sup>7</sup> <http://www.uwe.ac.uk/aqm/review/index.html>

Table 2.5 NO<sub>2</sub> Diffusion Tube Results (2006)

ID	Location	No Months	Unadjusted Mean	Mean	Bias Adjustment Factor	Bias Adjusted Mean
<b>WARWICK</b>						
1	Church St	12	24.4	n/a	0.99	24.1
2	St Marys Churchyard	10	22.5	n/a	0.99	22.2
3	Saltisford/Northgate	12	51.6	n/a	0.99	<b>51.1</b>
4	The Butts	11	44.9	n/a	0.99	<b>44.5</b>
5	Coventry Road	12	47.6	n/a	0.99	<b>47.1</b>
6	Bowling Green St	12	49.6	n/a	0.99	<b>49.1</b>
7	Theatre St	12	39.8	n/a	0.99	39.4
8	Pageant House 1	12	54.8	56.1	0.99	<b>55.5</b>
9	Pageant House 2	12	56.4			
10	Pageant House 3	12	56.9			
11	Jury Street	12	53.9	n/a	0.99	<b>53.4</b>
<b>LEAMINGTON SPA</b>						
12	Hamilton Terrace 1	12	23.8	24.1	0.99	23.9
13	Hamilton Terrace 2	12	23.6			
14	Hamilton Terrace 3	12	25.0			
15	High St	12	50.7	n/a	0.99	<b>50.2</b>
16	Spencer St	12	41.5	n/a	0.99	<b>41.1</b>
17	Farley St	12	31.2	n/a	0.99	30.9
18	Clemens St	10	27.1	n/a	0.99	26.8
19	George St	12	30.9	n/a	0.99	30.6
20	Wise St	12	63.6	n/a	0.99	<b>62.9</b>
21	Tachbrook Rd 1	4	38.6	38.2	0.99	37.8
22	Tachbrook Rd 2	4	37.8			
23	Old Warwick Rd 1	4	45.3	42.4	0.99	<b>42.0</b>
24	Old Warwick Rd 2	4	39.5			
25	<i>Bath Street (Old)<sup>(a)</sup></i>	8	37.6	n/a	0.99	37.2
	<i>Bath Street (Old)<sup>(b)</sup></i>	5	42.2	n/a	0.99	<b>41.8</b>
	<i>Bath Street (New)<sup>(c)</sup></i>	3	57.1	n/a	0.99	<b>56.5</b>
26	Clapham Terrace 1	12	22.4	22.1	0.99	21.9
27	Clapham Terrace 2	12	21.8			
28	New Street	12	26.0	n/a	0.99	25.7
<b>BARFORD</b>						
29	Barford 1	12	51.4	48.8	0.99	<b>48.3</b>
30	Barford 2	12	47.8			
31	Barford 3	12	47.1			
<b>KENILWORTH</b>						
32	Bertie Rd	9	22.2	n/a	0.99	22.0
33	Barrow Rd	8	46.7	n/a	0.99	<b>46.3</b>
34	New St	8	37.0	n/a	0.99	36.6
35	Fieldgate Lane	12	42.1	n/a	0.99	<b>41.7</b>
36	Warwick Rd	12	43.8	n/a	0.99	<b>43.3</b>
<p>(a) Includes monitoring data in June, July and August when Bath Street was closed.                      (b) Excludes monitoring data in June, July and August when Bath Street was closed.                      (c) The diffusion tube along Bath Street was relocated at the end of August 2006. Current Bath Street data should be used and interpreted with caution</p>						

The monitored concentrations in Warwick, Leamington Spa, Barford and Kenilworth are discussed below.

### ***Warwick***

Concentrations monitored within the AQMA, at Pageant House and Jury Street (kerbside) sites were above the AQS objective for 2006, confirming the need for the existing AQMA. However, monitoring data outside the AQMA (the Saltisford / Northgate junction, the Butts, the St. Johns / Coventry Road junction and Bowling Green St) also indicates an exceedence of the AQS objective for 2006. In addition, monitoring along Theatre St is marginally lower the annual mean AQS objective. With the exception of Jury Street (kerbside), all these diffusion tubes are close to the façades of residential properties. Therefore concentrations are likely to exceed the objectives at these properties.

Concentrations monitored at Church Street and St Mary's Churchyard in 2006, are well below the annual mean AQS objective of 40 µg/m<sup>3</sup>.

### ***Leamington Spa***

Annual mean NO<sub>2</sub> concentrations monitored in 2006 along the High Street, within the AQMA, are above the AQS objective. The concentration measured in 2006 at Wise Street, just within the western boundary of the AQMA, is well above the AQS objective at 52.7 µg/m<sup>3</sup>.

Concentrations measured in 2006 along Bath Street indicate that prior to being moved at the end of August 2006, the concentrations monitored were below the AQS objective (based on 8 months monitoring). However, in its new location (approximately 10 m north northeast of its previous position), monitoring over the remaining 4 months of the year show an exceedence of the AQS annual mean objective.

Concentrations at all other sites, including Spencer Street and Clemens Street (within the AQMA) are below the AQS objective.

### ***Barford and Kenilworth***

Concentrations monitored within the AQMA in Barford exceed the AQS objective for NO<sub>2</sub>. Whilst this confirms the current need for the declared AQMA, consideration of the proposed bypass should be factored in relation to any further decisions relating to this AQMA.

With the exception of Bertie Road and New Street, concentrations monitored in Kenilworth in 2006 approach or exceed the annual mean AQS objective.

### 3 Existing Policies and Strategies to Improve Air Quality

There are a number of related policies and strategies at the local and regional level that can be tied in directly with the aims of the Air Quality Action Plan, and will help contribute to overall improvements in air quality across Warwick District Council.

#### 3.1 Warwick District Local Plan

The Local Plan details the land use planning policies and proposals for the District. The Local Plan conforms to strategic planning policies, as set out in the Warwickshire Structure Plan (WASP) prepared by Warwickshire County Council and the Regional Planning Guidance (by way of the Regional Spatial Strategy) prepared by the West Midlands Regional Assembly.

It is fundamental to the achievement of the aims of the Air Quality Action Plan to have a Local Plan that recognises the importance of air quality in terms of the environmental impact of development and the need for sustainable transport measures. Warwick District Local Plan (2005) incorporates relevant policies of WASP and Regional Spatial Strategy (RSS), and addresses air quality issues through the following policies within the Core Strategy and Development Policies chapters (summarised):

#### **Chapter 3: Core Strategy**

##### **Objective 2F: To protect and improve air quality**

[*Warwick District Council*] will seek to maintain and improve local air quality by guiding and controlling the location of new development, particularly where this would have an impact upon public health or the natural environment.

#### **Chapter 4: Development Policies**

**DP2 Amenity**<sup>8</sup>: Development will not be permitted which has an unacceptable adverse impact on the amenity of nearby uses and residents, and/or does not provide acceptable standards of amenity for future users/occupiers of the development. This policy is applicable to all development proposals, including extensions and changes of use

**DP7 Traffic Generation**: Development will not be permitted which generates significant road traffic movements unless practicable and effective measures are taken to avoid adverse impact from traffic generation

**DP9 Pollution Control**: Development will only be permitted which does not give rise to soil contamination or air, noise, radiation, light or water pollution where the level of discharge, emissions or contamination could cause harm to sensitive receptors

---

<sup>8</sup> 'Amenity' is defined as the extent to which people are able to enjoy public places and their own dwellings without undue disturbance or intrusion from nearby uses. Examples of disturbance and intrusion include air pollution

In addition to a policy on Pollution the Local Plan includes strategies and policies with the following aims:

- to reduce the need to travel
- to promote the use of more sustainable travel options
- to ensure the prudent use of scarce resources, and limit and reduce the impacts of climate change
- to protect and enhance the natural environment
- to promote sustainable tourism

### **3.2 Warwickshire's Local Transport Plan (2006 – 2011)**

Warwickshire County Council is responsible for preparing the Local Transport Plan. This document sets out the transport improvements that are due to come forward over the next five years. These improvements are set within the context of the four Shared Priorities for Transport, these being:

- Delivering accessibility;
- Tackling congestion;
- Better air quality; and
- Making roads safer.

The LTP provides the main emphasis for those measures detailed in Section 6.

### **3.3 Warwickshire Air Quality Strategy**

Formally, the Warwickshire Air Quality Strategy sits within the LTP (see Section 1.1) as a Core Strategy (along with Accessibility, Road Safety and Congestion). As part of the Air Quality Strategy, a number of targets and indicators have been set. These are detailed in Table 3.1.

**Table 3.1 Air Quality Strategy – Targets and Indicators**

<b>Local Target/Indicator</b>	<b>Performance Indicator</b>	<b>Source of Data</b>	<b>Frequency of Monitoring</b>
Target (LTP8): Reduce the number of exceedences of the national air quality standards and objectives between 2005 and 2010	Monitored and modelled pollutant levels across the County. The revocation of AQMAs.	Countywide air quality monitoring stations	Annual
Target: Retain traffic volumes at 2004 levels in the urban areas of Nuneaton, Rugby, Warwick and Leamington Spa	Road traffic levels on local road networks	Road traffic surveys. Traffic modelling	Annual
Local Indicator: Ensure that air pollutant levels do not exceed national standards in the County where they occur	Air quality assessment of major transport proposals within Warwickshire	Countywide air quality monitoring stations. Regular and continued dialogue with the District/Borough Councils	Annual

Such measures have been set within the context of other LTP strategies that will have a significant impact of air quality, most notably:

- Congestion Strategy;
- Sustainable Freight Distribution Strategy;
- Public Transport Strategy, which includes Bus Strategy, Passenger Rail Strategy, Bus Information Strategy and the Public Transport Interchange Strategy;
- Cycling Strategy;
- Walking Strategy;
- Safer Routes to School/School Travel Plan Strategy;
- Changing Travel Behaviour Strategy; and
- Land Use and Transportation Strategy.

### 3.4 Warwickshire Structure Plan (WASP)

The Warwickshire Structure Plan (WASP) for the period 1996-2011 was adopted by Warwickshire County Council in August 2001. WASP is the strategic land use plan for Warwickshire and forms part of the statutory development plan for the county. In relation to air quality, relevant objectives contained within WASP are as follows:

- reduce the distances people need to travel, whilst acknowledging the continuing role of commuting in the County and the need to facilitate this through transport improvement
- protect from unnecessary harm, the environment and our cultural, historical and social heritage
- support walking, cycling and public transport as alternatives to the private car
- maintain and improve a regional and county strategic transport network
- encourage new tourism, recreation and leisure initiatives where these are compatible with the built and natural environment
- encourage the use of renewable natural resources, and conserve non-renewable resources.

As an extension to Policy ER.1 (which seeks to apply international, national and regional policy framework to the environmental resources within Warwickshire), Policy ER.2 is intended to be applied through more detailed local plan policies and reflect environmental assessment requirements in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 1999, and other Government guidance. Policy ER.2 is summarised below:

#### **Policy ER.2: Environmental Impact of Development**

*“The environmental impact of all proposed development on human beings, soil, fauna, flora, water, air, climate, the landscape, geology, cultural heritage and material assets must be thoroughly assessed, and measures secured to mitigate adverse environmental effects to acceptable levels. Local plans should include policies to ensure this takes place. The impact of existing sources of environmental pollution on the occupants of any proposed new development should also be taken into account. All assessment of environmental impact should take account of, and where possible seek to reduce, uncertainty over the implications of the proposed development. If adverse impacts cannot be mitigated to acceptable levels, development will not be permitted.”*

### **3.5 West Midlands Regional Assembly – Regional Spatial Strategy (RSS)**

Formerly referred to as the Regional Planning Guidance for the West Midlands (RPG 11) and published in June 2004, the West Midlands Regional Spatial Strategy (RSS) covers a wide range of subjects including housing, economic development, the built, historic and natural environment, renewable energy, minerals, waste and transport. The Strategy seeks to establish a more balanced and sustainable pattern of development by way of local authority development plans and local transport plans.

There are a number of strategic objectives that make up the focus of the RSS. However, in relation to this Draft Action Plan, the RSS provides a context for policies relating to the conservation of the environment and the improvement of the Region's transport systems.

For example, Policy QE4 states the following:

**Policy QE4: Greenery, Urban Greenspace and Public Spaces**

*“Local authorities and others should also encourage patterns of development which maintain and improve air quality and minimise the impact of noise upon public space.”*

The RSS includes both the Regional Transport Strategy and the Transport Deliver Plan (see Sections 3.6 and 3.7, respectively) and is currently being reviewed. The scale of development proposed for Warwick District the RSS may have a significant impact on Air Quality in Leamington Spa and Warwick. However, any such changes will need to be reviewed in future rounds of the Air Quality Review and Assessment process once the revised RSS has been published.

### **3.6 West Midlands Regional Assembly – Regional Transport Strategy (RTS)**

The Regional Transport Strategy (RTS) forms part of the Regional Strategy for the West Midlands (published in June 2004).

The aim of the RTS can be summarised as providing a strategic framework for Regional and local transport planning in the West Midlands by:

- ensuring better integration between transport policies and priorities and the wider Spatial Strategy;
- bringing together the outcomes of the multi-modal studies affecting the Region; and
- steering the development of the Region's LTPs

A major theme of the RTS (and this Draft Action Plan) is the need for behavioural change across the Region. As such, the RTS puts forward a number of measures aimed at changing behavioural travel patterns. These are as follows:

- measures to reduce the need to travel;
- well located facilities;

- provision of good quality, well designed walking and cycling facilities;
- promotion of travel awareness initiatives;
- better public transport;
- introduction of well-designed Park & Ride schemes;
- improved provisions for powered two-wheelers and taxis;
- better management of public and private car parking; and
- consideration of appropriate demand management measures.

These measures are formalised through Policies T1 to T8 in the RTS, with wider policies relating to “Transport and Accessibility” covered in Policies T9 to T12.

### **3.7 Transport Delivery Plan (TDP)**

By way of achieving an ongoing review of the RTS the West Midlands Assembly has established an active Transport Partnership (including local authorities, the Highways Agency, the Department for Transport, Centro, the business community, Birmingham International Airport, the freight industry and bus and rail industries), and a Transport Delivery Plan was produced in March 2005.

The current version of the TDP focuses on the status and progress of implementing each of the RTS Priorities for Investment (as detailed under Policy T12), with the aim of ensuring that the RSS policies are reflected in other plans and strategies such as LTPs. Interventions under T12 include changing travel behaviour, local congestion charging studies and strategic Park & Ride schemes.

### **3.8 Regional Sustainable Development Framework**

The Regional Sustainable Development Framework has been designed such that it helps all strategies, policies and plans to contribute to a sustainable future for the West Midlands at all levels (regional, sub-regional and local). The main objectives of the Regional SDF are centred on the key regional priorities relating to society, the environment, resources and the economy. These objectives are as follows:

- Sustainable consumption and production;
- Climate change and energy;
- Natural resource protection and environmental enhancement; and
- Sustainable communities.

More specifically (with regard to air quality), Objective 3.3 states the following:

*“Minimise air, water, soil, light and noise pollution levels and create good quality air, water and soils”*

### **3.9 Warwickshire County Council Green Travel Plan**

Warwickshire County Council established a Green Travel Plan in July 2004. The overall aim of the Travel Plan is to ensure that staff working at the Warwickshire County Council headquarters use modes of transport other than cars in order to get to and from work. Such a Plan portrays an outgoing, proactive image of the Council and that its own employees are able to lead by example, providing positive publicity throughout the County and a better response by members of the public in relation to those measures discussed in this document.

The five key objectives that the Green Travel Plan incorporates are as follows:

- to set out measures that will enable the organisation to meet the target car/employee ratio as set out by WCC for other businesses in the area;
- to enhance the organisations corporate social responsibility and environmental image;
- to encourage the use of more sustainable modes of transport;
- to reduce unnecessary travel; and
- to ensure that all staff are aware of the Travel Plan.

The core measures adopted as part of the Green Travel Plan aim to reduce the use of cars, where possible, by way of increasing the number of people walking, cycling, using motorcycles, using public transport, and the number of people lift sharing. Integral to these objectives is the promotion of the Councils commitment to the Green Travel Plan, both internally (to employees) and externally (to visitors to the Councils offices in Warwick).

A monitoring strategy has also been defined that will allow the objectives of the Green Transport Plan to be assessed.

## **4 Financing**

One of the key changes to the way that transport improvements are now funded has been the move towards the provision of 'planning guideline' figures from the Department for Transport, which have a five-year time horizon. This has allowed Transport Authorities to establish more robust plans with a greater degree of certainty regarding their funding.

The LTP contains a Delivery Strategy, which sets out the measures and improvements that will be funded over the period 2006-11. Following receipt of the annual LTP settlement from Government in December, the Transport Capital Programme for the forthcoming year is established and agreed by the County Council's Cabinet. A significant number of the schemes set out in section 6 of this Action Plan will be brought forward via this process.

**Further consultation required here with WCC/WDC before completion of final AQAP**

## 5 Consultation

Under Schedule 11 of the Act, Local Authorities are required to consult on their draft LAQM Action Plan. It is important for the success of the Action Plan to have involvement by all local stakeholders including local residents, community groups and local businesses in the drawing up the Action Plan in addition to their active participation in achieving the action plan measures. The Action Plan has been drawn up for consultation with relevant environmental health and transport representatives from WDC and WCC.

The following is a list of statutory and non-statutory consultees to which this draft Plan will be sent:

- The Secretary of State
- The Environment Agency
- The Highways Agency
- Primary Care Trusts
- WDC and WCC Councillors and Officers
- Neighbouring local authorities
- Local residents within and bordering the AQMA
- Relevant local businesses, community groups and forums
- Other relevant local stakeholders

All comments from both Statutory and non-statutory consultee's received on the draft Action Plan will be considered and incorporated where appropriate into the final Action Plan. The timescale for consultation shall be a minimum of 8 weeks.

## 6 Proposed Measures

The two sections below outline the proposed direct measures for the Warwick, Leamington Spa and Barford AQMAs and indirect measures to improve air quality throughout the whole Warwick District Council area. Measures which have already been introduced e.g. the Barford bypass, are also included.

Direct measures to reduce NO<sub>2</sub> concentrations within the AQMAs concentrate on the dominant sources of emissions – road traffic. Direct measures incorporate the following themes:

- Theme A1: Reduction of traffic flows within the AQMAs
- Theme A2: Reduction of pollutant emissions within the AQMAs
- Theme A3: Encouragement of public transport uptake

Indirect measures target those general emissions within an area that aim to further reduce background levels of pollution above and beyond that likely to be achieved by existing national and international agreements. Indirect measures incorporate the following themes:

- Theme B1: Reduction of the need to travel by car
- Theme B2: Reduction of background concentrations

Unless stated otherwise, all those actions discussed in the following Sections are reflected in Warwick District Councils Local Plan (as discussed in Section 3.1), which itself conforms to the RSS, the WASP and the LTP2.

### 6.1 Proposed Direct Measures for Existing AQMAs

The following provides a number of action plan measures that have been proposed to reduce NO<sub>x</sub>/NO<sub>2</sub> emissions from traffic in the Warwick, Leamington Spa and Barford AQMAs in pursuit of the NO<sub>2</sub> annual mean Air Quality Objective. A summary of the measures is provided in Table 6.1.

#### 6.1.1 Theme A1 – Reduction in Traffic Flows

##### Action 1: Highway Improvements and Traffic Management Measures

Such measures include the construction of the Barford bypass. Following completion of the bypass, traffic flows through Barford should reduce significantly resulting in a reduction of NO<sub>2</sub> at relevant receptors. Continued monitoring will confirm this and allow for the potential revocation of the Barford AQMA.

Such measures aim to improve the road network within Warwick District despite there being little scope to improve highway capacity within urban areas such as Warwick and Leamington Spa. Measures will be implemented by way of continued support for improvements to Junctions 13, 14 and 15 on the M40 (by way of Route Management Strategies along the M40 and A46) where existing levels of traffic can affect travel habits and route choice in and around Warwick and Leamington Spa.

Warwickshire County Council is also assessing the causes of queuing traffic at Junction 14 of the M40 (from the exit slip to Greys Mallory roundabout and at the roundabout itself). Alleviating congestion in this area could have a significant impact on travel patterns throughout Warwick and Leamington, and thus on the AQMA's.

In the particular case of Warwick, there is an ongoing project to look at various traffic management measures to reduce the amount of traffic in the town centre. A Forum of local residents and other stakeholders have drawn up a series of proposals for various town centre streets, and officers are being asked to investigate a number of different demand management measures to complement these. The effectiveness of these measures in improving air quality needs to be assessed as part of the decision making process.

### **Action 2: Leamington Urban Mixed Priority Scheme**

An Urban Mixed Priority Scheme has been established in Leamington Spa (with considerable financial support from this Department for Transport funded initiative) to make the town centre safer for people walking and cycling. The scheme covers the following roads within Leamington Spa town centre: The Parade, Victoria Terrace, Bath Street and Clarendon Avenue. Measures to improve the area for pedestrians and cyclists have included the following:

- widening footways;
- raised platforms at pedestrian crossing points;
- upgrading traffic signals;
- installing new signals at the junction of the Parade and Clarendon Avenue;
- rationalising street furniture and road signs; and
- creating a 20 mph speed limit for vehicles

### **Action 3: Cycling Improvements**

The main focus of the proposals in the LTP is the development of the urban cycle network within Warwick and Leamington Spa, in line with the County Council's Cycling Strategy. The development of such a network aims to increase the number of utility trips undertaken by bike.

In addition, as part of the continued development of the local and regional cycle route network, Warwick District Council, Warwickshire County Council and Sustrans will work closely to improve the National Cycle Network routes between Warwick and Kenilworth, Warwick and Stratford, and Leamington Spa and Rugby.

### **Action 4: Powered Two Wheeler (PTW) Strategy**

The PTW Strategy includes the establishment of dedicated secure on or off-street PTW parking facilities in Leamington Spa and Warwick.

## **6.1.2 Theme A2 – Reduction in Pollutant Emissions**

### **Action 5: Intelligent Transport Systems (ITS) Strategy**

There are proposals in the second LTP which have the potential to improve local air quality through ITS. The ITS Strategy includes such measures as urban traffic control, car park management, bus priority and travel information.

Following the success of ITS within Stratford upon Avon, a timetable of implementation has been drawn up for the entire county, including Leamington Spa and Warwick. Not all those measures included within the Stratford ITS will be rolled out across every town in Warwickshire. There are four key projects which will be implemented within the Warwick District area as a result of the ITS Strategy. These are as follows:

- Warwick car park management and information system;
- Leamington car park management and information system;
- Provision of free text Variable Message Signing in Warwick/Leamington Spa, to advise on incidents and congestion; and
- Provision of Real Time information on Travel Coventry Service 12 between Leamington Spa and Warwick University/Coventry.

## **6.1.3 Theme A3 – Encouragement of Public Transport Uptake**

### **Action 6: Improving the Attractiveness of Public Transport**

The aim of the scheme is to achieve a 'step change' in the attractiveness of public transport in the Warwick, Leamington Spa and Whitnash area. SPARK (Leamington **Spa** and **Warwick**) will deliver a fully integrated and improved public transport network that will focus on the co-ordinated provision of Park and Ride , high quality bus services, real time information and integrated ticketing

### **Action 7: Public Transport Interchange Strategy**

The Public Transport Interchange Strategy aims to contribute towards the achievement of those objectives in the LTP by promoting a passenger transport network which offers the following:

- better accessibility, both in terms of physical access to transport and its availability, to the widest cross section of the population;
- more travel choices to access work, services and leisure activities;
- an attractive and sustainable travel alternative to the car thereby helping to reduce traffic congestion and pollution levels and improving air quality and the environment; and
- better integration with other modes of transport.

In summary, the Public Transport Interchange Strategy aims to deliver measures and schemes to make interchanging easier by the development and promotion of several initiatives such as the building of infrastructure and 'soft' measures including the provision of better travel/passenger information.

### **Action 8: Bus Strategy**

The Bus Strategy will contribute to achieving the objectives of the LTP by promoting a bus network, which provides an attractive and sustainable travel alternative to the car thereby helping to reduce traffic congestion and pollution levels and improving air quality and the environment. The strategy outlines an aspirational minimum frequency of buses between 06:00 and 23.00 on any given day in Leamington Spa, Warwick and Kenilworth, and other urban centres such as Coventry, Nuneaton, Bedworth and Stratford-upon-Avon.

### **Action 9: Bus Information Strategy**

The Bus Information Strategy will contribute to achieving the objectives in the LTP by promoting a transport network which offers the following:

- better accessibility to the widest cross section of the population;
- more travel choices to access work, services and leisure activities;
- an attractive and sustainable travel alternative to the car thereby helping to reduce traffic congestion and pollution levels and improving air quality and the environment; and,
- better integration with other modes of transport.

### **Action 10: Passenger Rail Strategy**

As with the Bus Strategy, the Passenger Rail Strategy will also contribute to achieving the objectives of the LTP by promoting a passenger rail network, which provides an attractive and sustainable travel alternative to the car thereby helping to reduce traffic congestion and pollution levels and improving air quality and the environment.

The West Midlands "Route Utilisation Strategies" (RUS), published prior to the abolition of the Strategic Rail Authority (SRA) in 2005, presents solutions to the principal issues that face the railways in the West Midlands. These are identified as improving performance, managing peak passenger demand and crowding, responding to forecast growth and managing growing and changing freight demand. The West Midlands RUS also acknowledges the need for a new station at Kenilworth, and improved infrastructure between Leamington Spa and Coventry.

In relation to the proposed Kenilworth station, this is a key LTP proposal. As such, Warwickshire County Council is working with the new operator of the Cross Country franchise (Arriva) to deliver the scheme. In addition, the Warwick District Council Local Plan safeguards the site for the station.

### **Action 11: Parking Strategy**

The establishment of a Parking Strategy provides an opportunity to integrate a number of different mechanisms, such as the use of Intelligent Traffic Systems (ITS) to provide better information in relation to town centre car parking, the introduction of Decriminalised Parking Enforcement (DPE) in order to tackle on-street parking issues and improve traffic levels, and the introduction of Park & Ride schemes.

## **6.2 Proposed Indirect Measures to Improve Air Quality across Warwick District Council**

There are a number of indirect measures that can be implemented by both the District and County Council that can improve air quality throughout Warwick District. These will reduce background pollution concentrations and indirectly will work towards achieving the Air Quality Objectives within the AQMAs. A summary of the measures is provided in Table 6.2.

### **6.2.1 Theme B1 – Reduction of the need to travel by car**

#### **Action 12: Changing Travel Behaviour Strategy**

The LTP2 contains a strategy with the aim to reduce the impact of cars on the environment by promoting and encouraging different modes of transport. The strategy will focus largely on school journeys (e.g. “Walk to School” initiatives) as well as journeys to and from work, with the aim of maintaining the proportion of car (sole passenger) journeys to school at the 2005/2006 level (15%).

#### **Action 13: Cycling Strategy**

Warwickshire’s Cycling Strategy contains a number of objectives aimed at improving the safety and quality of the cycling environment, whilst at the same time promoting cycling as an attractive mode of transport. One of the key goals of such a strategy is to increase the number of “utility” journeys made by cycling, these being journeys to school, work, the shops, the rail station and other locations/facilities. Proposed methods for increasing the number of people opting to use bicycles include the development of town cycle route network maps, prioritising routes, safer routes to school, advisory cycle routes (along less congested roads where dedicated cycle routes do not exist), rural cycle routes, canal towpaths and development of the Sustrans National Cycle Network.

In addition, proposed strategic cycle routes for Warwick and Leamington Spa in particular are discussed under Action 3.

#### **Action 14: Safer Routes to School Strategy**

As part of the Safer Routes to Schools initiative, schools are encouraged to write a School Travel Plan. Where a new school is being built, a School Travel Plan is required as part of the submission for planning approval. Funding is also available for schools with approved School Travel Plans to upgrade facilities that will encourage the use of sustainable travel, such as the provision of cycle storage and lockers. Safer Routes to School are normally only developed for schools that have produced a travel plan.

## **6.2.2 Theme B2 – Reduction of background concentrations**

### **Action 15: Land Use and Transportation Strategy**

The principal aim of the Land Use and Transportation Strategy is to encourage new development in Warwickshire to be sustainable. Two key elements of the Strategy relate to the reduction in the need to travel and reducing the reliance on the use of cars by promoting improvements to public transport, walking and cycling. These elements are clearly outlined within a number of other Actions contained within this Draft Action Plan. Successful implementation of such strategies would not only have a positive impact on Leamington Spa and Warwick town centres, but also other areas within Warwickshire that would benefit from a reduction in background concentrations.

### **Action 16: Sustainable Freight Distribution Strategy**

As a way of working towards a sustainable freight distribution network in Warwickshire, the Freight Quality Partnership (FQP) was established in 2002. Through this Partnership, a number of measures have been proposed that are aimed to progress the LTP strategy in relation to freight distribution whilst achieving a balance between improving the local economy and protecting the environment. These measures include the production of freight route maps, zoning systems in urban areas to direct heavy goods vehicles, defining and enforcing delivery times, reviewing parking and loading restrictions, consolidation areas where goods are transferred to smaller deliver vehicles, and reducing the amount of HGV traffic through environmentally sensitive areas e.g. AQMAs. Such a strategy also includes the encouragement of switching from road to rail for the movement of freight.

### **Action 17: Local Air Quality Management and Pollution Control**

The air quality monitoring network in WDC provides more accurate information and understanding of air quality within the District. Continuous monitoring stations are installed at two sites within the District to monitor NO<sub>2</sub> concentrations so that modelled predictions can be verified and the progression of action plan measures can be monitored and assessed (the Leamington Spa AURN site also monitors ozone, carbon monoxide, sulphur dioxide and particulates). This is supplemented by NO<sub>2</sub> passive diffusion tubes throughout the District, a large number of which are within the declared AQMAs in Warwick and Leamington Spa.

WDC should continue their commitment to local air quality monitoring within the District to ensure a high standard of data is achieved to assess against air quality objectives

**Table 6.1 Action Plan of Direct Measures Proposed for the AQMA**

Action	Description	Organisation responsible	Date to be achieved by	Cost	Air quality improvement in AQMA	Other potential impacts	Rank (based on cost-effectiveness)
1	Construction of the Barford bypass, review of junction improvements along the M40	WCC			Potentially high	Potential increase in road traffic fatalities and/or reduced safety due to upward changes in traffic speed. Change in traffic habits due to decrease in congestion	
2	The establishment of an Urban Mixed Priority scheme in Leamington Spa	WCC			Medium	Potential increase in road traffic elsewhere. Costs to business	
3	Improve the Urban Cycle Network within Warwick and Leamington Spa. Improve National Cycle Network routes between Warwick and Kenilworth, Warwick and Stratford, and Leamington Spa and Rugby	WCC, WDC, Sustrans			Low		
4	Dedicated secure on and off street PTW parking facilities in Leamington Spa and Warwick	WCC, WDC			Low	Potential increase in accidents, injuries	
5	Development of Intelligent Transport Systems (ITS) in Warwick and Leamington Spa	WCC			Medium		
6	Improving the attractiveness of public transport in Warwick and Leamington Spa (SPARK), including the possible establishment of Park and Ride schemes	WCC, WDC			Medium/High		
7	Public Transport Interchange Strategy	WCC			Low to medium		

Action	Description	Organisation responsible	Date to be achieved by	Cost	Air quality improvement in AQMA	Other potential impacts	Rank (based on cost-effectiveness)
8	Improve (and promote) bus services between Leamington Spa, Warwick and Kenilworth	WCC			Low to medium		
9	Bus Information Strategy	WCC			Low to medium		
10	Promotion of a passenger rail network which provides an attractive and sustainable alternative to the car, including a new station at Kenilworth and improved infrastructure between Leamington Spa and Coventry	WCC			Medium	Potential issues for parking associated with a new station at Kenilworth, and capacity parking at existing stations	
11	Establishment of a Parking Strategy provides an opportunity to integrate a number of different mechanisms, such as the use of Intelligent Traffic Systems (ITS)	WCC			Medium	Potential effectiveness may be reduced with new car parks in central locations	
<p><b>The costs are provided as: 'Low' (up to £1 million); 'Moderate' (between £1 million – £5 million); and, 'High' (greater than £5 million) and are indicative based on professional judgement (to be updated with further consultation with WCC)</b></p> <p>The air quality improvements are provided as: 'Low' (&lt;0.2µg/m<sup>3</sup>); 'Moderate' (between 0.2 – 1 µg/m<sup>3</sup>); and, 'High' (greater than 1 µg/m<sup>3</sup>) and are indicative based on professional judgement</p>							

**Table 6.2 Action Plan of Indirect Measures to Improve Air Quality**

<b>Proposed measure</b>	<b>Description</b>	<b>Organisation responsible</b>	<b>Indicator</b>	<b>Date to be achieved by</b>
12	Reducing the impact of cars on the environment by promoting and encouraging different modes of transport	WCC, WDC	Percentage modal shift from car to other forms of transport	Ongoing
13	Improving the safety and quality of cycling routes across the county, and decrease the number of "utility" journeys	WCC, WDC, Sustrans	Percentage modal shift to cycling/walking, No. miles new cycle lanes/routes	Ongoing
14	Encouragement for Schools to write a School Travel Plan (to be included in planning applications for new schools)	Local schools	Percentage modal shift from car to other forms of transport. Reduction in reported accidents	Ongoing
15	Land Use and Transportation Strategy that encourages new development in Warwickshire to be sustainable and promote the use of public transport over personal car use.	WCC	No. planning applications where improvements secured	Ongoing
16	Sustainable Freight Distribution Strategy, to be managed and reviewed by the Freight Quality Partnership. Includes a rail freight strategy to encourage road to rail freight transport	WCC, Highways Agency, DfT, Network Rail	Improvement in efficiency and dissemination in freight transport	Ongoing
17	WDC will continue their commitment to local air quality monitoring within the District to ensure a high standard of data is achieved to assess against air quality objectives	WDC	No. monitoring sites, percentage data capture	Ongoing

## 7 Scenario Testing

**This section will be amended following quantification of some of the proposed measures upon completion of the final AQAP**

### 7.1 Traffic Flows – High Street, Warwick

In order to put some of those measures discussed in Section 6 into context, a brief study was undertaken looking at the proposed impact of changes in traffic flows and traffic profiles along High Street, one of the busiest roads in Warwick. Such an assessment will provide some clarity as to the levels of traffic reduction required (along High Street, Warwick, at least) or changes in traffic composition or profiles, in order for the AQS objective for NO<sub>2</sub> to be met at sensitive receptors along this road.

As part of this study, the most recently available traffic count data has been used (i.e. that which was used in the Further Assessment). This data was based on vehicle count data taken along High Street, Warwick, between Wednesday 30<sup>th</sup> November 2005 and Thursday 8<sup>th</sup> December 2005. Updated traffic count data along High Street was available between 9<sup>th</sup> January 2006 and 1<sup>st</sup> February 2006. However, it was noted that there were roadwork's occurring along High Street during this period. As such, the data would not be representative of typical traffic flows along this particular road.

#### Scenario 1: Percentage Reduction to Total Traffic

Using the Annual Average Daily Traffic (AADT) flows for High Street, Warwick, the reduction in predicted concentrations of NO<sub>x</sub>/NO<sub>2</sub> at Pageant House has been determined based on an AADT reduction of 5%, 10%, 20% and 30%. The reduction in AADT is provided in Table 7.1 along with the predicted NO<sub>x</sub>/NO<sub>2</sub> concentration. It has been assumed for this Scenario that percentage HGV will remain at 2.8%.

**Table 7.1 Predicted NO<sub>x</sub>/NO<sub>2</sub> based on Reduction AADT**

	Modelled as part of Further Assessment	5%	10%	20%	30%
AADT	18356	17438	16520	14685	12849
LDV	17850	16950	16058	14274	12489
HGV	506	488	463	411	360
NO <sub>2</sub>	<b>46.4</b>	<b>45.9</b>	<b>45.3</b>	<b>43.9</b>	<b>42.4</b>
NO <sub>x</sub>	97.1	94.7	92	86.6	81.2

Based on 2005 traffic data, not even a 30% reduction in traffic along High Street, Warwick would result in concentrations less than the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup>. This figure has not taken account of updated vehicle emission rates<sup>9</sup>, reduction in background concentration and changes in traffic flows beyond 2005. However, vehicle emissions are expected to reduce as technologies improve, together with background concentrations of NO<sub>x</sub>/NO<sub>2</sub>. As such, a reduction of greater than 30% (along High Street, Warwick) is seen as a conservative estimate of the reduction required in order to meet the AQS objective. In

---

<sup>9</sup> Updated vehicle emission rates are expected at some point in 2007

addition, given the high NO<sub>2</sub> concentrations along High Street compared to other areas within Warwick and Leamington Spa, such a reduction may also result in the AQS being met elsewhere.

### **Scenario 2: Percentage Reduction in HGV Traffic**

Based on 2005 traffic data, HGVs comprise only 2.8% of the traffic composition along High Street, Warwick. Given that the HGV proportion of the traffic composition is already relatively low, any further reductions are unlikely to reduce those predicted concentrations detailed in Table 7.1 below the AQS objective. As such, it is clear that the focus of the Action Plan should be towards non-HGV traffic. This is reflected throughout this document and Section 6 in particular, where measures have been proposed that relate specifically to the movement of non-HGV traffic e.g. school journeys, journeys to and from work, and efforts to change behavioural patterns in relation to the use of cars for such purposes.

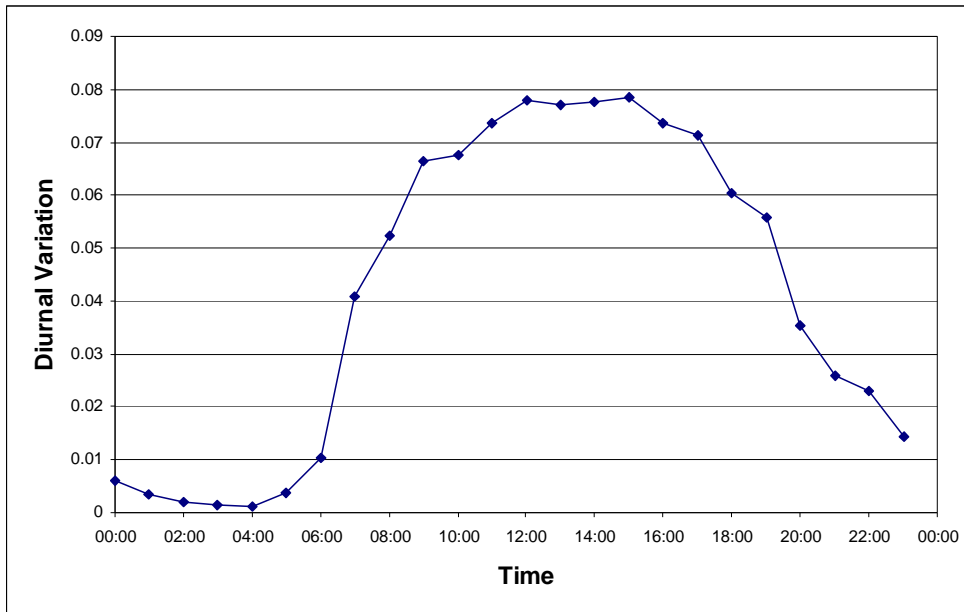
However, as indicated in the LAQM Further Assessment (2006) and summarised in Section 2.2 of this Action Plan, emissions from HGV traffic along the High Street in Leamington Spa represent a higher proportion of the total predicted NO<sub>x</sub> concentrations than those from LDV traffic. Whilst a reduction in the movement of HGV traffic along the High Street, Leamington Spa, should be addressed where possible through proposed measures within this Action Plan (e.g. Action 16 – Sustainable Freight Distribution), this contribution does not reflect the general trend in Warwick and Leamington Spa where for the majority of roads the contribution from LDV traffic is higher than that from HGV traffic. As such, the focus of this Action Plan should remain with non-HGV traffic.

### **Scenario 3 Diurnal Traffic Profile**

Graphical representation of the diurnal traffic profile (based on vehicle count data taken along High Street, Warwick, between Wednesday 30<sup>th</sup> November 2005 and Thursday 8<sup>th</sup> December 2005) is provided in Figure 7.1. The diurnal profile represents the variation in traffic throughout the period of monitoring. Since monitoring has occurred over 9 days, a diurnal profile can be generated for each separate day, weekdays only, weekends only, or in the case of Figure 7.1, a seven day average (Monday to Sunday).

The profile clearly indicates that the bulk of traffic movements along High Street, Warwick, occur between 07:00 and 19:00, with peak traffic movements occurring between 12:00 and 15:00.

**Figure 7.1 Diurnal Traffic Profile along High Street, Warwick**



Any measures aimed at reducing the amount of traffic using High Street, Warwick, should clearly be directed at journeys undertaken between 07:00 and 19:00. This period would include journeys to and from school and work, both of which have been addressed at numerous points throughout Section 6. Other broader measures would reduce traffic movements (particularly by car) throughout the remaining parts of the day.

## **8 Implementation and Monitoring**

Warwick District Council will work jointly on the action plan measures with the relevant partners including WCC, transport operators, schools and local businesses. To secure the necessary air quality improvements there must be involvement by all local stakeholders and WDC should actively work to encourage community participation in the process.

The implementation and effectiveness of the Action Plan will be carefully monitored through monitoring of NO<sub>2</sub> at relevant receptor locations within the relevant AQMAs. In addition, traffic flow changes on the key roads will also be assessed through the review and assessment process, and the uptake of local measures such as the Urban Mixed Priority Route will be monitored. Indicators have been provided for the indirect measures to be undertaken by the Council to monitor progress annually.

There will be regular review and assessment of the action plan proposals to evaluate progress and this will be reported annually.

## 9 Glossary of terms

Abbreviation	Full name
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ATM	Active Traffic Management
BAT	Best Available Technology
DEFRA	Department for Environment, food and Rural Affairs
DETR	Department for Transport and Regions
DOE	Department of the Environment
HGV	Heavy goods vehicles
WCC	Warwickshire County Council
LAQM	Local air quality management
LDF	Local Development Framework
LTP	Local Transport Plan
WDC	Warwick District Council
NAQS	National Air Quality Strategy
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Oxides of nitrogen
NSCA	National Society for Clean Air
PM <sub>10</sub>	Fine particle matter less than 10µm diameter
ppb	Parts per billion
SO <sub>2</sub>	Sulphur dioxide
µg/m <sup>3</sup>	Micrograms per cubic metre

**To be completed with Final AQAP**

## 10 References

**To be completed with Final AQAP**

## **Appendix A**

**Table A1: Source Apportionment of NO<sub>x</sub> (Warwick AQMA)**

Location	Predicted Total NO <sub>2</sub> 2005 (µg/m <sup>3</sup> )	Predicted Total NO <sub>x</sub> 2005 (µg/m <sup>3</sup> )	Contribution (µg/m <sup>3</sup> )			Contribution (%)		
			Background	LDV	HDV	Background	LDV	HDV
Saltisford (between West Rock roundabout & Parkes Street)	46.0	96.4	38.5	33.4	24.6	40.0%	34.7%	25.5%
Theatre St (between Cocksparrow St & Linen St)	40.1	73.7	38.5	21.0	14.2	52.2%	28.5%	19.3%
Bowling Green St (Junction with High St & West St)	43.4	85.6	38.5	28.0	19.1	45.0%	32.7%	22.3%
West Street	40.4	73.9	38.5	20.5	14.9	52.1%	27.7%	20.2%
High St	49.2	110.2	38.5	42.8	29.0	34.9%	38.8%	26.3%
Jury St (near Castle St, The Butts & Smith St Junction)	46.0	95.8	38.5	34.3	23.0	40.2%	35.8%	24.1%
The Butts	40.7	75.1	38.5	21.9	14.7	51.3%	29.1%	19.6%
Smith Street	34.4	58.2	38.5	12.0	7.6	66.2%	20.6%	13.1%
St Nicolas Church Street	47.0	98.5	38.5	36.0	24.1	39.1%	36.6%	24.5%
Castle Lodge Roundabout	37.7	68.9	38.5	20.2	10.3	55.9%	29.3%	14.9%

**Table A2: Source Apportionment of NO<sub>x</sub> (Leamington AQMA)**

Location	Predicted Total NO <sub>2</sub> 2005 (µg/m <sup>3</sup> )	Predicted Total NO <sub>x</sub> 2005 (µg/m <sup>3</sup> )	Contribution (µg/m <sup>3</sup> )			Contribution (%)		
			Background	LDV	HDV	Background	LDV	HDV
High St (Junction with Church St, Bath St & Clemens St)	36.9	64.5	38.5	11.3	14.7	59.7%	17.6%	22.8%
High St (Junction with George St & Althorpe St)	36.6	63.6	38.5	10.2	14.9	60.5%	16.1%	23.4%
High St (between St Marys Rd & Farley St)	30.8	48.7	38.5	4.9	5.4	79.0%	10.1%	11.0%
High St (Junction with Wise Street)	50.6	114.0	38.5	27.8	48.1	33.8%	24.4%	42.2%
High St/Old Warwick Road	32.1	52.2	38.5	6.1	7.7	73.8%	11.6%	14.8%
Bath St (between Regent Place & Gloucester St)	40.3	73.0	38.5	20.1	14.5	52.7%	27.6%	19.8%
Clemens St (between Clemens St & Tower St)	33.1	53.3	38.5	6.2	8.7	72.2%	11.6%	16.3%
Clemens St (adjacent to Charlotte St)	28.2	43.0	38.5	2.3	2.2	89.5%	5.3%	5.2%
Church St (Junction with Regent Place, Church St & Chapel St)	31.1	48.9	38.5	5.6	4.8	78.7%	11.4%	9.9%