

**A CRITICAL EVALUATION OF  
LOCAL AIR QUALITY MANAGEMENT  
AND ITS CONTRIBUTION TO MEETING THE  
EU ANNUAL MEAN NITROGEN DIOXIDE  
LIMIT VALUE**

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## ABSTRACT

Local Air Quality Management (LAQM) was initially intended to play a supplementary role in assisting the UK government in achieving its European air quality obligations (Directive 2008/50/EC) through the implementation of action plans to reduce public exposure to local air pollution hotspots. Since the inception of LAQM in 1997, however, exceedences of health-based nitrogen dioxide objectives, primarily related to road traffic sources, has proved to be more widespread and intractable than previously anticipated. The failure of the UK government to achieve the EU annual mean limit value by the prescribed deadline of 1<sup>st</sup> January 2010 for 93% of the UK's Zones and Agglomerations has increased the emphasis on the role of LAQM. At the same time, the lack of revocations of local Air Quality Management Areas has called into question the efficacy of local authorities Air Quality Action Plans (AQAPs).

This research draws on the extensive body of evidence provided by the LAQM process since 1997 to establish if it possible to determine whether local AQAPs have been effective in achieving their aims and in improving air quality at a local level. By evaluating the degree of success achieved through individual AQAPs and then building an aggregate picture of progress to achievement of their goals, it has been possible to assess the effectiveness and efficiency of the LAQM regime as a national strategy to meet national air quality objectives and to contribute to EU air quality legislative requirements.

The key finding from this research is a confirmation of the thesis statement, i.e. that historically LAQM has not been a successful strategy in achieving selected EU limit values. An absence of adequate AQAP progress reporting and representatively sited robust monitoring data indicate that, collectively, the means to assess the effectiveness of LAQM in terms of reducing local concentrations of nitrogen dioxide does not currently exist.

The thesis offers nine recommendations for Defra and the Devolved Administrations to improve the effectiveness of LAQM in assisting with the achievement of the NO<sub>2</sub> annual mean EU limit value. They are proposed as solutions to the limitations and obstacles observed in undertaking this research, and in essence advocate a combined and coordinated national and local approach to reducing traffic-related nitrogen dioxide concentrations in order to achieve the EU limit value. The current revision of LAQM and the recent changes to the EU AAQD reporting requirements make this an opportune moment to instigate these proposed changes

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# CHAPTER 1. INTRODUCTION TO THE THESIS

## 1.1. Chapter overview

This chapter frames the research title, “*A Critical Evaluation of Local Air Quality Management and its Contribution to Meeting the EU Annual Mean Nitrogen Dioxide Limit Value*” and sets out the thesis statement and objectives. In response to these, the thesis critically evaluates the available evidence to establish if it is possible to determine whether implementation of local Air Quality Action Plans in the UK have been associated with changes in local concentrations of nitrogen dioxide (NO<sub>2</sub>) over the last 14 years and, thereby, whether Local Air Quality Management as whole can be considered to have been effective in contributing to meeting EU air quality legislation.

## 1.2. Framing the research

Since 1997, UK local authorities have been managing the quality of air in their jurisdictions against national health-based objectives for specific pollutants as part of the Local Air Quality Management (LAQM) process, prescribed by the *Environment Act* (1995) and a suite of national air quality strategy documents (Defra, 2007; Defra, 2003; Department for the Environment, Transport and the Regions, 2000; Department of the Environment, 1997) and subsequent air quality regulations. For the last 14 years, this LAQM process has involved measurement and reporting to Defra and the Devolved Administrations, known as the Review and Assessment stage, and Air Quality Action Planning to remediate any exceedences of the specified objectives designated as Air Quality Management Areas (AQMAs). There have been a number of reviews of the process, most recently from independent government consultants (Moorcroft and Dore, 2013; Faulkner and Russell, 2010), which have criticised the effectiveness of Action Planning to improve local air quality, given that the number of local authorities with AQMAs does not appear to be declining. There have, however, been no comprehensive published studies examining the effect of Action Plan implementation on measured local air quality.

LAQM was developed as a means to assist national government in meeting similar health-based air quality limit values set by the European Commission (EC) (Air Quality Framework Directive 96/62/EC and subsequent daughter directives). LAQM was intended to complement national measures, such as implementation of EU legislation (National Emission Ceiling Directive 2001/81/EC) to reduce emissions from various processes, including traffic. While industrial and domestic sources of emissions have reduced under the implementation of these national measures, traffic has continued to be an increasingly important source of health-damaging pollutants. Consequently, in

93% of the UK's Zones and Agglomerations, the UK government failed to meet the 2010 deadline for the limit values for nitrogen dioxide (NO<sub>2</sub>), one of the key indicators of traffic pollution and itself a health-damaging pollutant and also a precursor for tropospheric ozone (O<sub>3</sub>). The government's approach to meeting the EU Directive 2008/50/EC (which replaced Directive 96/62/EC) has been subject to two recent scrutiny reports from the Environmental Audit Committee (House of Commons Environmental Audit Committee, 2011; House of Commons Environmental Audit Committee, 2010), which recognised the important role that local authorities have to play in helping to reduce traffic pollution. In 2013, however, Defra issued a consultation on the future of LAQM, proposing a range of options including the removal of the role of local authorities in managing air quality (Defra, 2013a).

This research sets out to evaluate the effectiveness of LAQM, as evidenced over the last 14 years, as a means to improve local air quality and thereby to assist the UK government in meeting the EU annual mean limit value for NO<sub>2</sub>. This focused perspective does not seek to assess the worth of LAQM in terms of its wider benefits, but concentrates on its key role of reducing local air pollution hotspots with particular reference to the most significant problem faced by national government, the reduction of traffic-related NO<sub>2</sub>.

### **1.3. Thesis statement and objectives**

This research will draw on the extensive body of evidence provided by the LAQM process since 1997 to establish whether local Air Quality Action Plans (AQAPs) have been effective in achieving their aims and in improving air quality at a local level. By evaluating the degree of success achieved through individual AQAPs and then building an aggregate picture of progress to achievement of their goals, it will be possible to assess the effectiveness and efficiency of the LAQM regime as a national strategy to meet national air quality objectives and to contribute to EU air quality legislative requirements.

The thesis statement is as follows:

*Local Air Quality Action Plans are not successful in terms of reducing local concentrations of nitrogen dioxide. Therefore, Local Air Quality Management will not achieve the annual mean UK air quality objective and will not make an effective contribution to meeting the relevant EU limit value.*

The research objectives are therefore to:

Objective 1: Document the change in the concentration of annual mean nitrogen dioxide from road traffic using continuous monitoring data, in AQMAs declared in Round 1 of Review and Assessment;

Objective 2: Evaluate whether the measures included in the Air Quality Action Plans produced following Round 1 are being achieved and whether implementation is contributing to an improvement in local nitrogen dioxide concentrations.

#### **1.4. Summary**

This chapter has introduced the conceptualisation of the research title, framing the fundamental issues that need to be addressed and setting out the thesis statement that underpins the research, and the objectives that will be used to test the thesis. The following three chapters expand on the issues raised in section 1.2 in order to give context to the Methodology (Chapter 6) and Discussion (Chapter 8).



## **CHAPTER 2. INTRODUCTION TO AIR QUALITY POLICY RELEVANT TO THE UK**

### **2.1. Chapter overview**

This chapter provides a critical analysis of the policy context of local air quality management in Britain, to understand the progression, the role of its protagonists and the drivers and constraints that have steered implementation of the LAQM process to its current form. The chapter begins with a brief introduction to the political context of UK air pollution at the turn of the 21<sup>st</sup> century before going on to describe European and UK air quality policies, their implementation and an assessment of the current air quality management practice as an introduction to the aims and objectives of this thesis.

### **2.2. Introduction to traffic-related air pollution**

Air is essential for human life. In economic terms it is the ultimate 'public good' (Vogler, 2001) from which everyone can benefit without exclusivity. Conversely, air pollution is thus a 'public bad' (Kolstad, 2000), the ultimate costs of which are paid for through early death and/or ill-health by the most vulnerable (elderly and infants), resulting in financial burdens on health providers which, through taxation and alternative benefits foregone, affect all.

UK government has a responsibility to the European Union (European Commission Directorate-General Environment, 2010) and to the electorate (HM Government, 2010) to ensure environmental protection; i.e. to protect the environment from human impact and to protect human health from the effects of that impact. Internalising these negative externalities by enforcing pollution controls under the 'polluter pays principle' (OECD, 2001) is relatively simple where a specific polluter, e.g. an industrial point source, can be identified. Increasingly however, ambient air quality is being degraded through the transport choices of the wider population.

In typical use, vehicle engines do not burn fuel efficiently. Incomplete combustion of fossil fuels leads to the emission of particulate matter and other impurities in the fuel. The high temperatures in combustion also cause the oxidation of atmospheric nitrogen ( $N_2$ ) to nitric oxide (NO) and small quantities of nitrogen dioxide ( $NO_2$ ), collectively termed nitrogen oxides (NO<sub>x</sub>). Emissions of NO also rapidly react with atmospheric oxygen producing 'secondary  $NO_2$ ' (Colvile *et al.*, 2001). NO<sub>x</sub> also reacts photochemically with volatile organic compounds (VOCs) to produce tropospheric ozone. Typically ozone is considered a 'transboundary pollutant' as tropospheric

weather conditions can result in the reaction occurring many kilometres away from the main urban sources. In still conditions, however high ozone concentrations can cause urban smog.

There have been numerous social epidemiological papers published on the health effects of air pollution and others measuring and modelling public exposure and eliciting disease burden (morbidity) and mortality through accountability studies (Raaschou-Nielsen *et al.*, 2013; Zhang and Batterman, 2013; Yim and Barrett, 2012; Goodman *et al.*, 2011; Autrup, 2010; Sucharew *et al.*, 2010; Shin *et al.*, 2009; Brook, 2008; Craig *et al.*, 2008; O'Neill *et al.*, 2003; Mitchell, Namdeo and Kay, 2000). Particulate matter and ozone are deemed to be the most damaging pollutants for human health, causing respiratory and cardio-vascular symptoms. The chemical composition of particles is complex and varied, and the health impacts may be as much due to the heavy metals or less volatile organic compounds adsorbed on them, as to the size fraction. On inhalation, fine particulates can penetrate down to the alveoli and cross into the bloodstream causing pulmonary oxidative stress, which itself has been linked to long-term health effects such as cancer, Alzheimer's and premature death (Beelen *et al.*, 2013; Loomis *et al.*, 2013; Raaschou-Nielsen *et al.*, 2013; Shah *et al.*, 2013; Straif, Cohen, and Samet, 2013; Kelly and Fussell, 2011; Laumbach and Kipen, 2010; Sucharew *et al.*, 2010). Current estimates have suggested that exposure to anthropogenic particulate matter (PM<sub>2.5</sub>) may reduce birth-cohort life expectancy by an average of 1–12 months in the UK, presenting a greater mortality burden than passive smoking or road traffic accidents (COMEAP, 2010). Epidemiological studies have also established causal links between nitrogen dioxide, a toxic gas, and ill-health (Shah *et al.*, 2013, Suwanwaiphatthana, Ruangdej and Turner-Henson, 2010; Latza, Gerdes and Baur, 2009). Due to its ability to be relatively simply and cheaply monitored, nitrogen dioxide has traditionally been used as a useful proxy in estimating exposure to other traffic-related pollutants, especially particulate matter (Health Effects Institute Panel on the Health Effects of Traffic-Related Air Pollution, 2010).

Vehicle ownership has increased substantially since 1950 with the number of licensed vehicles in England rising from 4 million to 34.5 million in 2012 with an annual average growth rate of 3.6% 1950-2011 (Department for Transport, 2013a; Department for Transport, 2012). Vehicle usage has seen a greater increase: there has been a more than ten-fold increase in the annual vehicle miles travelled between 1949 and its peak in 2007 (28.9 – 314.1 billion vehicle miles), primarily due to increases in cars and taxis. Over the three years post-2007, the vehicle traffic volume showed an unprecedented fall, but has subsequently stabilised to 302.6 billion vehicle miles in 2012 (Department



for Transport, 2013b). Despite the recent slowdown, the Department for Transport's National Transport Model predicts a return to growth with the recovery of the economy, with an average 43% growth in traffic forecast 2010-2040 (Department for Transport, 2013c).

**Table 2.1: Chronology of EU and UK legislation for air pollution (adapted from EPUK (2009))**

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This growth in traffic in the UK has resulted in transport emissions now overshadowing the industrial and domestic sources of air pollution that have dominated over the last 150 years. Emissions from these two sources have now largely been resolved through EU and UK legislation (Table 2.1) and changes in fuel use (Williams, 2004; Elsom, 1992). Transport emissions too have fallen over the last 30 years due to the introduction of catalytic converters for petrol vehicles and improved engine technology; however, in recent years this decline has faltered leading some to suggest that the growth in vehicle numbers has outpaced the rate of technological advance and that fundamental changes in transport policy will be required to improve air quality (Carslaw *et al.*, 2011; Royal Commission on Environmental Pollution; 2007; Tinch, 2001).

Politically, imposition of measures to restrict vehicle use is highly sensitive and a vociferous UK motoring lobby has arisen to defend the public's freedom and 'right to drive', opposing measures such as fuel levy increases and the introduction of congestion charging in major cities. Furthermore, transportation and economic growth and prosperity have been closely aligned over the last half century and limitations on one are often seen as detrimental to the other. This can result in potentially conflicting departmental objectives in central and local governments between the HM Treasury, planning and transportation on the one hand and environmental health and protection on the other (Begg and Gray, 2004).

Within this context, the following section will describe the air quality policies that have been introduced in Europe and the UK, primarily over the last 15-20 years, in response to accumulating evidence of the health effects of air pollution.

### **2.3. European air quality policy**

In 1987 the World Health Organisation (WHO) Regional Office for Europe produced a report advising governments on ambient and indoor air quality guidelines based on the effects on human health and ecosystems of some 28 pollutants. These guidelines were subsequently revised, but provided the basis for the health-based standards set in the European Air Quality Framework Directive (AQFD) 1996 (Council Directive 96/62/EC) (Krzyzanowski and Cohen, 2008).

The 1996 EU AQFD (Council Directive 96/62/EC) was developed as a holistic approach to air quality management across Europe. The aim was to harmonise approaches to monitoring and reporting of member states' air quality against set health-based standards in order to reduce pollution where necessary (Maynard and Cameron, 2001). The lack of a coherent policy framework for the EU air quality directives that had been enacted during the 1980s and early 1990s (Table 2.1) had

meant that member states that failed to meet limit values were typically not penalised and there was no incentive for consideration of long-term air quality objectives (Grant, Matthews and Newell, 2000). Council Directive 96/62/EC, which was introduced in September 1996, brought in 'long-term limit values' as well as 'current permitted values' and a requirement on member states to draw up plans with which to meet them. The first 'daughter' directive (Council Directive 1999/30/EC) was adopted in June 1999 and established health-based limit values for sulphur dioxide, nitrogen dioxide, PM<sub>10</sub> and lead, based on guidelines set by the WHO. The target date for these pollutants was 1<sup>st</sup> January 2005, or 2010 for nitrogen dioxide. Subsequent daughter directives were introduced in 2000, 2002 and 2004 to address benzene, carbon monoxide, ozone, heavy metals (arsenic, cadmium, nickel, and mercury) and polycyclic aromatic hydrocarbons (PAHs).

The AQFD and the first three daughter directives were subsumed into Directive 2008/50/EC on Ambient Air Quality and Clean Air for Europe, or the Ambient Air Quality Directive (AAQD), in May 2008. In addition to consolidating the previous directives, the AAQD also introduced a new air quality objective for PM<sub>2.5</sub> (fine particles) including the limit value and exposure related objectives, the possibility to discount natural sources of pollution when assessing compliance against limit values and the possibility for time extensions of three years (i.e. to June 2011 for PM<sub>10</sub>) and up to five years (i.e. to January 2015 for NO<sub>2</sub> and benzene) for complying with limit values, based on conditions and assessment by the European Commission. Member states were required to transpose the AAQD into national legislation before 11<sup>th</sup> June 2010.

On 12<sup>th</sup> December 2011, the Commission Implementing Decision 2011/850/EU set out new Implementing Provisions on Reporting (IPR) on the AAQD 2008/50/EC and 4<sup>th</sup> daughter directive 2004/107/EC. The IPR Decision established new prescriptive rules and guidance on annual electronic reporting of member states' assessment and management of ambient air quality, which applies from 1<sup>st</sup> January 2014. Reporting is now via the EIONET Air Quality Portal<sup>1</sup>, which replaces previous reporting mechanisms, however, the original guidance on assessment is retained<sup>2</sup>.

In addition to setting standards for ambient concentrations, as part of the EU's thematic strategy on air quality and a commitment to the United Nations Economic Commission

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<sup>1</sup><http://www.eionet.europa.eu/aqportal>

<sup>2</sup><http://ec.europa.eu/environment/air/pdf/guidanceunderairquality.pdf>

for Europe (UNECE) Convention on Long Range Transboundary Air Pollution (LRTAP), emissions ceilings were set for four pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds (VOCs) and ammonia) in October 2001 under the National Emissions Ceiling Directive (NECD) 2001/81/EC.

The AAQD, the fourth daughter directive and the NECD have all been subject to a review as part of the review of the EU Thematic Strategy on Air Pollution and related policies. A new Clean Air Policy Package was adopted on 18<sup>th</sup> December 2013, which includes:

- A Clean Air Programme for Europe, which describes the problem and sets out new interim objectives for reducing health and environmental impacts up to 2030. It also defines the necessary emission reduction requirements for the key pollutants and the policy agenda that will be necessary to achieve the objectives;
- A revised NECD, containing updated national ceilings (caps) for six key air pollutants (PM, SO<sub>2</sub>, NO<sub>x</sub>, VOCs, NH<sub>3</sub> and CH<sub>4</sub>) for 2020 and 2030;
- A new Directive for Medium-sized Combustion Plants between 1 and 50 MWth.
- A ratification proposal for the amended Gothenburg Protocol under the 1979 UNECE Convention on Long-Range Transboundary Air Pollution.

The air quality standards in the AAQD were not revised as many Member States are already facing infringement proceedings for failure to meet the existing standards, although it was recognised that they were insufficient in relation to the WHO air quality guidelines. It was anticipated that the stricter NECD caps would “pave the way for tightened standards ...at a later stage”, but that meanwhile the EC would consider simplifying implementation of the AAQD (European Commission, 2013).

#### **2.4. UK air quality policy**

The development of the European Air Quality Framework Directive mirrored changes in air quality legislation occurring in the UK at that time. As a member of the European Community, the UK Government is obliged to adhere to EU Directives and to transpose these into national legislation. Having reached the concurrent conclusion that piecemeal legislation was insufficient to meet the air quality problems caused by the growth in road traffic usage, in a pre-emptive move the UK Government brought in air quality legislation as part of the *Environment Act* (1995).

### **2.4.1. Responsibilities for air quality policy**

Until 1970, responsibility for air pollution control was divided among the ministries of transport, housing, local government, technology and agriculture, the Department of Social Services, the Board of Trade and the Secretaries of State for Scotland and Wales (McCormick, 1991). The formation of the Department of the Environment (DoE) brought air quality and transport together initially, though these departments were divided again in 1976. Despite enjoying a brief spell of centralised coordination as the Department for the Environment, Transport and the Regions (DETR) in the late 1990s, it could be argued that responsibility for air quality is almost as divided today as it was nearly 40 years ago (Appendix 1 Appendix 1:). Although the ultimate responsibility for air quality (and environmental policy generally) in England now lies with the Department for the Environment, Food and Rural Affairs (Defra)<sup>3</sup> and the Devolved Administrations of Scotland, Wales and Northern Ireland<sup>4</sup>, other central government departments share a role in improving air quality in the UK. For example, the Department for Transport (DfT), until 2010, had joint ownership of the air quality indicator in Public Service Agreement 28 with reference to traffic-related pollutants, NO<sub>2</sub> and PM<sub>10</sub> (HM Treasury, 2007)<sup>5</sup>. The Department for Communities and Local Government (DCLG) covers land-use planning, in which air quality was defined as a “material consideration” in development control decisions under PPS 23 (ODPM, 2004), now superseded by the National Planning Policy Framework. DCLG also has the remit for local government who have Defra-appointed local air quality management responsibilities. Though not formally accountable, the Department of Energy and Climate Change, Department of Health and Her Majesty's Treasury also have been recognised as responsible for ensuring air quality is integrated into wider policy (House of Commons Environmental Audit Committee, 2010).

### **2.4.2. Historical air quality policy**

Historically Britain's pollution control policy has focused on industrial and domestic sources. The introduction of the Clean Air Act in 1956, in response to the fatal London Smog of four years previous, gave local authorities the responsibility to declare Smoke

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<sup>3</sup> Formed from the merger of the Ministry for Agriculture, Fisheries and Food (MAFF) and the fall-out of the DETR break-up into the Department for Transport and the Local Regions (DTLR) in 2001, itself subsequently split into the Department for Transport (DfT) and the Office of the Deputy Prime Minister (ODPM) [latterly the Department for Communities and Local Government (DCLG)].

<sup>4</sup> Devolved administrations have their own national responsibility for air quality, though Defra are directly reportable to the European Union on behalf of the UK.

<sup>5</sup> Joint Public Service Agreements were abolished by the coalition government in 2010.

Control Areas and legislated against the use of non-compliant fuels and appliances in domestic properties within these areas. This was one of the rare occasions when the UK Government crossed the domestic threshold and attempted to control behaviour within people's homes (Brimblecombe, 1987). The reception and response to the Clean Air Act was eased with a coincident improvement in general living standards resulting from increased personal wealth and a widespread shift to cheaper gas for domestic heating and cooking (Williams, 2004; Brimblecombe, 1987).

The government's response to industrial pollution had tended towards "non-coercive, voluntary compliance" partnerships with industry relying on "flexibility and consensus" through the use of "Best Practicable Means" and codes of "good emissions conduct" (Heritier, Knill and Mingers, 1996). Public information on industrial practices and pollution was minimal or non-existent, while the apparent improvement in visible air quality since the introduction of the Clean Air Act assuaged any concern about air pollution. In the 1980s, UK environmental policies began to be influenced by European legislation with the introduction of Directives setting targets to reduce emissions of airborne pollutants (Table 2.1). The harmonisation of environmental regulation across Europe, which member states are obliged to follow, removed the stranglehold industry had held over national environmental policy development. Also at this time, a rise in green consumerism and lobbyist groups led the government to recognise the importance of consultation and a new more liberal disclosure regime resulted in public registers of permitted processes (Heritier, Knill and Mingers, 1996).

Though criticised as ineffectual and hampered by the Transport, Energy and Treasury ministers, the publication in 1990 of the government's environment strategy White Paper, 'This Common Inheritance', marked a turning point for air quality policy in Britain. The White Paper recognised the impact of traffic emissions on health and proposed the adoption of an effects-based approach in line with EC Directives, introducing the Bill that would subsequently be passed as the Environmental Protection Act 1990 (Department of the Environment, 1990).

The Environmental Protection Act repealed and replaced the previous Alkali Acts and introduced Integrated Pollution Control (IPC) and Local Authority Pollution Control (LAPC) regimes to manage respectively emissions from 'Part A' and 'Part B' prescribed

industrial processes<sup>6</sup>. Part B installations are now regulated under Local Authority Pollution Prevention and Control (LAPPC), which relates only to regulation of emissions to air. As with A(1) and A(2) installations, regulators must set permit conditions which are based on the use of 'Best Available Techniques' (BAT)<sup>7</sup>. Thus there is now a more stringent, 'polluter pays' approach to industrial pollution control, but with a more greatly devolved administration.

By the time the 1992 update on the White Paper was published, the government had identified that while emissions from industrial and domestic sources were declining, traffic numbers, and emissions, were increasing rapidly, leading to significant air pollution episodes. The report stated that technological improvements, such as tightened EC emissions standards for new vehicles, would need to be combined with traffic management options to reduce urban congestion, possibly including radical measures such as road-pricing, if emissions improvements were not to be undermined by increasing traffic growth. The government had also begun to demonstrate a commitment to understanding the science of urban air pollution with the extension of the urban air quality monitoring network, and the commissioning of the Expert Panel on Air Quality Standards (EPAQS) (Department of the Environment, 1992); EPAQS was to be further informed by the DoE's Quality of Urban Air Review Group (QUARG), and the Department of Health's Committee on the Medical Effects of Air Pollution (COMEAP) and Advisory Group on the Medical Aspects of Air Pollution Episodes (MAAPE).

In March 1994 the government published a discussion paper on ambient air quality standards and management proposing the basis for the Local Air Quality Management framework that is recognisable today (Department of the Environment, 1994). In essence, a series of health-based standards were to be set for pollutants following advice from EPAQS. Responsibility for meeting these standards, beyond the scope of national measures, would fall to local authority environmental health departments as a natural addition to their Smoke Control and LAPC requirements. As traffic was now recognised as the greatest source of air pollutants in urban areas, the report advised

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<sup>6</sup> IPC and LAPC have been replaced with the Environmental Permitting (England and Wales) Regulations 2007 (superseded by the Environmental Permitting (England and Wales) Regulations 2010) and the Pollution Prevention and Control (Scotland) Regulations 2000 under the Pollution Prevention and Control Act 1999, which implements Directive 96/61/EC on Integrated Pollution Prevention and Control (as well as the Waste Incineration Directive (WID), the Large Combustion Plants Directive (LCPD), Solvent Emissions Directive (SED), and Petrol Vapour Recovery (PVRI)), and gives local authorities additional responsibility for 'Part A(2)' processes.

<sup>7</sup> Previously 'Best Available Technique Not Entailing Excessive Cost' (BATNEEC).



that local air quality management should be integrated with transport and land-use planning as implicitly linked policy areas. These recommendations were taken forward in the subsequent strategic policy document published the following January, which stated that the consultation feedback on the 1994 discussion paper was strongly in favour of a coordinated framework approach (Department of the Environment, 1995). The government promised to pass the air quality management framework into legislation and to publish a National Air Quality Strategy and guidance for local authorities to begin implementation of their new air quality management duties over the following two years. The *Environment Act* (1995) was thus introduced six months later.

### **2.4.3. The Environment Act (1995)**

The *Environment Act* (1995), which created the Environment Agency for England and Wales (EA) and the Scottish Environment Protection Agency (SEPA), also included new arrangements for air quality in Part IV. Part IV (sections 80-91) set out the new legislative requirements for the Secretary of State, the Environment Agency and local authorities in relation to Local Air Quality Management (LAQM). The Act includes a statutory duty on the Secretary of State to publish a national Air Quality Strategy to include standards and objectives for specific pollutants. The Act also imposes a requirement on local authorities to review and assess air quality in their areas against these objectives. Where these reviews and assessments reveal that an air quality objective is not likely to be met by the deadline specified for its attainment in the strategy, a local authority is obliged to designate an Air Quality Management Area and develop an action plan “...in pursuit of the achievement of air quality standards and objectives in the designated area...” (*Environment Act* (1995)). The Act provides the Secretary of State and SEPA with reserve powers to ensure that local authorities comply with their requirements under the Act, but there is no specific reference made to enforcement of the achievement of air quality objectives as it was recognised that local authorities could not be held solely responsible for their local air quality.

#### **2.4.3.1. National Air Quality Strategy and Regulations**

The first National Air Quality Strategy, which was published in March 1997, established health-based standards for eight air pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, particulates (PM<sub>10</sub>) and sulphur dioxide) based on advice from EPAQS (Department of the Environment, 1997). In the 1997 Air Quality Regulations these standards were translated into air quality objectives for seven of the eight pollutants that local authorities were to work towards achieving by 31<sup>st</sup> December 2005. Ozone, as a transboundary pollutant, was considered to be outside the scope of LAQM and so was not included in the Regulations.



In January 2000 the Air Quality Strategy and Regulations were revised and updated to take account of the EU Air Quality Framework's first 'daughter' directive (1999/30/EC) on sulphur dioxide, nitrogen dioxide, PM<sub>10</sub> and lead, resulting in a tightening of the hourly objective for nitrogen dioxide from 287 µg/m<sup>3</sup> to 200 µg/m<sup>3</sup> (Department for the Environment, Transport and the Regions, 2000). An addendum to the Air Quality Strategy was published in February 2003 to revise objectives for carbon monoxide and benzene in line with the second EU 'daughter' directive (2000/69/EC), and to introduce an objective for polycyclic aromatic hydrocarbons (PAHs) and a new objective for PM<sub>10</sub>. The new objectives for PAHs and PM<sub>10</sub> were not brought into the Air Quality Regulations for LAQM, except in Scotland where the PM<sub>10</sub> 24-hour objectives were tightened from 2010 (Defra, 2003). The latest update to the Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in July 2007, following an evaluation of the strategy. The new strategy retained existing air quality objectives but replaced the provisional 2010 PM<sub>10</sub> objective (except in Scotland) with an exposure reduction approach for PM<sub>2.5</sub>. This was set as an annual mean objective of 25 µg/m<sup>3</sup> (12 µg/m<sup>3</sup> in Scotland) accompanied by a 15% reduction in Background Urban concentrations to be achievable by 2020 (Longhurst *et al.*, 2009; Defra, 2007). Again, this objective was not brought into the Air Quality Regulations and therefore local authorities are not currently required to consider PM<sub>2.5</sub> (Defra, 2009).

#### **2.4.3.2. Statutory and non-statutory LAQM guidance**

As required under section 88(1) of the *Environment Act* (1995), to assist local authorities in undertaking their LAQM duties the Secretary of State published a set of four guidance documents, as hard copy, in 1997. These documents covered: the 'Framework for review and assessment of air quality' (LAQM.G1(97)); 'Development of local air quality strategies' (LAQM.G2(97)); 'Air quality and traffic management' (LAQM.G3(97)) and 'Air quality and land use planning' (LAQM.G4(97)). These were followed in 1998 by four technical guidance documents: 'Monitoring for air quality reviews and assessments' (LAQM.TG1(98)); 'Preparation and use of atmospheric emissions inventories' (LAQM.TG2(98)); 'Selection and use of dispersion models' (LAQM.TG3(98)) and 'Review and Assessment: Pollutant Specific Guidance' (LAQM.TG4(98)).

In 2000, both sets of guidance documents were updated under the same themes in line with the updated Air Quality Strategy. In 2003 the documents were again updated but

published in two single documents: Policy Guidance (LAQM.PG(03))<sup>8</sup> and Technical Guidance (LAQM.TG(03)). LAQM.PG(03) provided guidance on the legislative background and reporting requirements of LAQM, designation of AQMAs and preparation of Air Quality Action Plans (AQAPs), consultation and liaison, development of local and regional air quality strategies and information on integration of air quality and transport and air quality and land-use planning. LAQM.TG(03) gave more practical guidance on the review and assessment of each of the seven pollutants of concern, with Annexes on monitoring and emissions estimation.

In December 2003 additional guidance was published on producing Progress Reports to include a requirement to update on the implementation and effectiveness of AQAPs. An addendum to LAQM.PG(03) for English local authorities, LAQM.PGA(05) was published in March 2005. LAQM.PGA(05) provided guidance for local authorities on evaluating the cost effectiveness and wider scale issues of AQAPs and on integrating Action Plans for traffic-related AQMAs into the Local Transport Plan. The guidance also implemented an Order, made under section 6 of the Local Government Act 2000, to relieve the bureaucratic burden on local authorities under the Government's "Freedoms and Flexibilities" agenda (Lifting the Burdens Task Force, 2007). The Order precluded local authorities rated as "excellent" under the Comprehensive Performance Assessment (CPA)<sup>9</sup> from the requirement to prepare AQAPs or Local Transport Plans.

With each iteration, the guidance documents were developed based on the experience gained from the implementation of LAQM which was fed back through the evaluative reports of the process using local authority questionnaires (Air Quality Management Resource Centre (University of the West of England) and Air Quality Consultants Ltd, 2007). The most recent update to the Policy and Technical Guidance documents took place in February 2009 and signified a substantial change to the Review and Assessment process, moving from a pollutant by pollutant assessment of local air quality to an assessment by source. Feedback from local authorities who had previously found the process repetitious and time-consuming was taken into consideration together with recognition of the need to relieve burden (Lifting the

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<sup>8</sup> Separate Policy Guidance documents were published in England and Wales, Scotland and Northern Ireland.

<sup>9</sup> The Comprehensive Performance Assessment (CPA) was replaced by the Comprehensive Area Agreement (CAA) in February 2009, redesignating "excellent" authorities as "4\*" authorities. At the time of writing the CAA is being abandoned thereby removing any exemption local authorities may have previously had on preparing Air Quality Action Plans or Local Transport Plans.

Burdens Task Force, 2007). In addition, a number of previously unassessed sources, e.g. biomass, poultry farms and moving locomotives, had been identified since the previous update as having the potential to lead to exceedences of the air quality objectives, and were therefore added to the assessment process.

In addition to the statutory guidance from DETR and Defra, there have been a number of supplementary guidance documents published by Environmental Protection UK<sup>10</sup> to assist local authorities with the LAQM process (Appendix 1Appendix 2:) (Environmental Protection UK, 2010; Environmental Protection UK and Local Authorities Coordinators of Regulatory Services, 2009; NSCA, 2004; NSCA, 2001; NSCA, 2000a; NSCA, 2000b; NSCA, 1999). Although not official guidance, the documents were produced by a committee of relevant experts in consultation with Defra and the Devolved Administrations and are still widely used by local authorities to provide more detailed assistance with specific aspects of the process, e.g. declaring AQMAs, developing Action Plans, and assessing the potential air quality impacts of new development.

#### **2.4.4. LAQM consultation (2013)**

Following publication of a commissioned report on the effectiveness of LAQM Action Planning (Moorcroft and Dore, 2013), Defra issued a consultation on the future of LAQM in England in July 2013 (Defra, 2013a). The consultation proposed four options, ranging from 'business as usual' to the abolition of the LAQM regime, offering a 'preferred option' (Option 3) which would remove the Review and Assessment responsibilities on local authorities, resulting in a reliance on national monitoring and modelling, and focusing on the Action Planning element of LAQM.

The aims behind the proposed options were fourfold. Firstly, to reduce confusion by consolidating the two sets of Air Quality Regulations, the national Air Quality Standards Regulations 2010, which transposes EU air quality legislation and are applicable to the UK Government, and the Air Quality (England) Regulations 2000 (amended 2002), which set out the air quality objectives applicable to local authorities under LAQM. Secondly, to clarify the roles and responsibilities of local government and other stakeholders with regard to improving air quality. Thirdly, to reduce the reporting burden on local authorities, with the intention that this would facilitate their focus on action planning; and fourthly, to ensure that local authorities have access to evidence-based measures to improve air quality. While the aims were laudable, the implications

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<sup>10</sup> Formerly the National Society for Clean Air and Environmental Protection.

for the Defra preferred option generated a heated response amongst air quality professionals and practitioners with 232 substantive responses (including from 133 local authorities) and over 18,000 petition responses (Defra, 2013b). The University's response to the consultation, led by the author, can be found in full in Appendix 1Appendix 13:.

Defra published a summary of the consultation responses and its reply on 13<sup>th</sup> December 2013 (Defra, 2013b), in which they stated that they will consult on the changes to regulations and guidance by mid-late 2014 to be implemented a year later. In summary Defra's reply to the consultation responses was:

- **Aim 1:** Defra will review the range of air quality objectives that apply to local authorities, taking into account the relevance of these objectives for health protection, and the levels assessed in recent years.
- **Aim 2:** Defra will review the need for additional guidance on these duties as part of its review of guidance to local authorities in fulfilling their duties under the Act.
- **Aim 3:** Defra will make proposals to introduce regular annual reporting on air quality for local authorities, taking into account comments made and following further discussions with stakeholders on the content of such reports. Defra will take account of the support for retaining AQMAs and will also review guidance on declaration/revocation procedures in order to reduce administrative burdens, taking into account matters of health impacts through exposure to air pollution and scope for measures.
- **Aim 4:** Defra will continue to explore (with delivery partners and stakeholders) way of improving and disseminating evidence-based measures, including supporting innovative schemes.

In general, Defra appeared to have taken on-board the concerns of respondents and weakened their position on their preferred proposed option. However, their reply is arguably insubstantial and non-committal, reflecting in part that this is only the first part in the consultation process, the second part of which will consult on the revised guidance and regulations in late-2014. The long consultation process (set to resolve in late-2015) has the potential to temporarily reduce the effectiveness of LAQM in the interim as local authorities are placed in a 'limbo-state' in which their commitment to the current regime is effectively undermined by the potential for 'imminent' change. The

announcement that the changes are now unlikely to come into effect before the May 2015 General Election are also concerning should the incoming Parliament choose to repeal the decisions passed, meaning that local authorities cannot take assurance from any emergent policies in the interim.

## **2.5. Summary**

This chapter has set out the increasing problem of traffic-related air pollution and critically appraised air quality policy development within the EU and UK contexts. It has introduced the concept of Local Air Quality Management in the UK and its component parts, Review and Assessment and Action Planning, which underpin the bilinear enquiry of this research: changes in locally monitored concentrations of nitrogen dioxide and the implementation of measures to reduce them. These areas will be discussed respectively in more depth in the following two chapters.



## **CHAPTER 3. REVIEW AND ASSESSMENT**

### **3.1. Chapter overview**

The purpose of this chapter is to underpin the first line of enquiry of this research, which examines the monitoring data to determine whether there have been any significant changes in the road-contribution of concentrations of ambient nitrogen dioxide. This chapter critically reviews the monitoring and modelling data available to local authorities and the changing reporting requirements, collectively referred to as Review and Assessment.

### **3.2. Monitoring and modelling requirements**

Local authorities are obliged to assess air quality in their jurisdictions, either by monitoring or modelling, as advised in the current Technical Guidance documents (Defra, 2009). Marsden and Bell (2001) provides a comprehensive evaluation of monitoring and modelling tools that were available to local authorities in Round 1, specifically relating to assessment of road traffic pollution. The two main monitoring methods available are passive diffusion tubes and automatic chemiluminescence continuous monitors. The former are relatively inexpensive and can be easily sited in hotspot areas, but suffer from a relatively high level of uncertainty in the data ( $\sim\pm 25\%$ ) (Defra, 2009). Automatic monitors, conversely, are expensive and difficult to site, requiring access to power, security and sufficient space, but provide finer resolution temporal data with a lower level of uncertainty ( $\sim\pm 15\%$ ) (Defra, 2009). Defra operate a network of automatic monitors at a range of locations across the UK known as the Automatic Urban and Rural Network (AURN), which are used to report concentrations to the European Commission, in line with assessment criteria prescribed by the Air Quality Directives, as well as for local authorities' and public use. Site types may be Urban (Kerbside, Roadside, Centre, Background, Industrial), Suburban, Rural, Remote and Special. Urban Kerbside and Roadside sites may be considered more typical of traffic-affected sites, whereas Urban Centre and Background sites represent general concentrations within the urban area, with no direct source affecting them. Siting criteria for AURN monitors for EU assessment differ to LAQM Technical Guidance for local authorities (Table 6.3, p. 63).

Prior to the deadline for the NO<sub>2</sub> annual mean objective, local authorities would have been required to predict whether the objective was likely to be exceeded by 2005. For many local authorities this meant undertaking dispersion modelling to forecast NO<sub>2</sub> concentrations based on modelled baseline data and estimated future years' emissions factors. Although dispersion models must be verified and adjusted against local

monitoring data, modelling is inherently uncertain, requiring numerous assumptions and estimations (Colvile *et al.*, 2002). It is for that reason that, once the objective deadline had passed, local authorities were advised to rely more on monitoring data in their assessment of likely exceedences, although dispersion modelling continues to be used by many to determine the spatial extent of any exceedences on which to base their AQMA consultations. Defra also undertake modelling for a variety of purposes, including for compliance assessment against the EU limit values to complement the AURN monitoring. The scale of background modelling (based on a 1 km grid of the UK) is coarser than local dispersion modelling and therefore does not reflect local hotspot concentrations, whereas the roadside concentrations modelled are based on Highways Agency traffic data and restricted to selected routes of the strategic network and are, therefore, not relevant for the majority of local roads or de-trunked motorways (Defra, 2013c).

### **3.3. Reporting requirements**

Since the LAQM process began in 1997, local authorities have undertaken four complete rounds of Review and Assessment and embarked on a fifth in April 2012. Under section 82 of the *Environment Act (Part IV)* (1995) local authorities are required to periodically review and assess air quality in their areas against the air quality objectives for the seven pollutants of concern specified in the Air Quality Regulations. Where the objectives are unlikely to be met by the date specified, the local authority must declare an Air Quality Management Area (AQMA) and work towards meeting the objectives through the implementation of an Air Quality Action Plan (AQAP). The Review and Assessment process includes the initial screening of sources and pollutants, an assessment of potential exposure against the objectives, and a more detailed assessment to determine the likelihood that the objective(s) will not be met and the extent of the area of any exceedence(s) prior to declaration of an AQMA. The declaration of the AQMA and the subsequent Action Plan do not form part of the Review and Assessment process; these aspects are described separately in Chapter 4. There is a fourth stage of further assessment to be undertaken within 12 months of declaration which is intended to determine the proportionate sources of emissions and to calculate the likely time period required to achieve the objective (Figure 3.1).



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**Figure 3.1: LAQM reporting schematic (Round 1) (derived from LAQM.G1(00))**

With the understanding gained from experience and the development of new guidance documents, the process of Review and Assessment has changed subtly with each of the assessment rounds. The first set of guidance documents provided in 1997 state that local authorities were to undertake a phased, three-stage approach to review and assessment commensurate with necessity. All local authorities (or collaborative groups of local authorities) were obliged to undertake the first stage, which comprises a comprehensive review of sources of pollutants of concern that could have a significant impact with the potential for exposure of individuals within their locality. Where such

sources were identified, the authority should proceed to a second screening stage. The stage 2 review and assessment was intended to estimate, using simple monitoring or modelling techniques, whether there was likely to be an exceedence of the air quality objectives for any specified pollutant. A significant risk of an exceedence then led to a third stage review and assessment. The third stage made use of more sophisticated monitoring and modelling to make a detailed and accurate assessment of whether an air quality objective would not be met by 2005. The assessment included an estimation of the magnitude and geographical extent of any exceedence. If breaches of the objectives were predicted to occur by the 2005 deadline specified in the Air Quality Strategy, an AQMA was declared (Figure 3.1).

No statutory timescales were imposed for completion of Review and Assessment duties in Round 1 and the frequency of reporting was left to the local authorities' discretion. It was advised, however, that local authorities were expected to have completed the first round of reports within two years of Part IV of the *Environment Act* (1995) coming into force, and that all local authorities should have completed a further round of Review and Assessment by the objective deadline of 2005. The second set of guidance documents, published in March 2000, recognised the difficulties local authorities were having in achieving this deadline and provided a suggested timescale for submission of the final stage first draft report by June 2000 with a recommendation that where possible local authorities should aim to submit sooner. This timeframe was subsequently relaxed again to December 2000 (Laxen *et al.*, 2002).

Most local authorities began the Review and Assessment process at the beginning of 1998 and, although only 54% managed to achieve the December 2000 deadline, 98% had completed Round 1 by the end of 2001 (Appendix 3. Table 1) (Laxen *et al.*, 2002). It was initially anticipated that many local authorities would not proceed beyond the Stage 1 assessment and that only large metropolitan areas and cities would be likely to declare AQMAs (Bartlett *et al.*, 1997). According to the evaluation report of the first round of Review and Assessment, 71% of local authorities proceeded to a Stage 3 assessment and 22% went on to declare an AQMA, 95% of which were for exceedences of the annual mean objective for nitrogen dioxide and more than 50% for the PM<sub>10</sub> 24-hour mean objective, primarily from road traffic sources (Chatterton *et al.*, 2004; Laxen *et al.*, 2002). The cut-off period for these statistics is not clear as a number of reports and AQMA Orders relating to Round 1 were submitted subsequent to the reporting deadline, and continued to be submitted by some local authorities into the period for Round 2.

Following the evaluation report, more prescriptive and detailed guidance documents were published in February 2003 prior to commencement of the second round of Review and Assessment. Acting on recommendations in the evaluation report, the structure of Review and Assessment was changed in Round 2 from a three-stage to a two-stage approach (Figure 3.2). Stages 1 and 2 were merged into a combined Updating and Screening Assessment (USA), intended to update on changes since the previous round and to conclude on the requirement to proceed to a Detailed Assessment (DA) (previously Stage 3) for any likely exceedences of the objectives. The DA also allowed local authorities to assess the need to revoke or amend any AQMA declared. The Round 2 USA was due for submission to Defra by May 2003 and any resulting DA was to be submitted by the end of April 2004. Subsequent rounds of Review and Assessment have followed the same structure on a rolling three-year cycle reporting in April of each year.

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**Figure 3.2: LAQM reporting schematic (Rounds 2 and 3) (derived from LAQM.PG(03))**

A further recommendation of the evaluation report enacted in Round 2 was that local authorities should produce Progress Reports (PRs) in years when they neither submit a USA or DA. This would provide continuity between the rounds and maintain the profile of LAQM in busy, and often stretched, Environmental Health departments. Local authorities were also expected to submit their reports to statutory consultees under Schedule 11 of the *Environment Act* (1995) and to consult more widely with the public,

local businesses, regional development agencies and other local authority departments on the preparation of their DAs.

During Round 2, half of local authorities in Britain proceeded to a DA following submission of their USA and 57% of these led to AQMA declarations, indicating that exceedences of the objectives were found that had not been identified in Round 1 (Appendix 3. Table 2). There are a number of potential reasons for this. These include the experience gained by local authorities in recognising potential sources; increased air pollutant monitoring surveys; more prescriptive Technical Guidance, LAQM.TG(03), which targeted attention on hotspot locations where pollutant concentrations are likely to be highest (an approach which was advocated as more cost-effective than a blanket review); and falsely optimistic projected concentrations based on flawed emissions factors (Chatterton *et al.*, 2006; Hassan *et al.*, 2006). As in Round 1, the majority of DAs were produced for exceedences of the nitrogen dioxide and PM<sub>10</sub> objectives from road traffic sources. There were a few localised exceedences of sulphur dioxide and benzene objectives in Round 2 but no exceedences were reported of the other objectives (1,3-butadiene, carbon monoxide and lead) indicating that objectives for these pollutants have been met. By the beginning of Round 3 (April 2006), 191 (47%) local authorities had declared AQMAs (Air Quality Management Resource Centre (University of the West of England) and Air Quality Consultants Ltd, 2007).

Round 3 continued in the same reporting format as Round 2 with the submission of USAs due in April 2006, DAs or PRs due the following April and the final PR of the Round due April 2008 (Figure 3.2). The air quality objective deadlines became live in 2005 and the reliance on monitoring data, as opposed to modelled predictions, revealed that new sites of exceedence were continuing to be found. 53% of LAs submitted a DA in Round 3, and ~65% of those relating to nitrogen dioxide required an AQMA (Appendix 3. Table 3) (Barnes *et al.*, 2010a).

In February 2009, just before the Round 4 USA deadline in April 2009, the Policy Guidance (LAQM.PG(09)) and Technical Guidance (LAQM.TG(09)) were revised. The changes, particularly for USAs, were substantial, reflecting a change from the repetitious assessment of sources by pollutant, to a more refined assessment of specific pollutants (focusing on NO<sub>2</sub> and PM<sub>10</sub>) by source. There were also a number of new sources added (e.g. narrow congested roads with <10k vpd), which some local authorities had identified as having the potential to cause exceedences of the air quality objectives. One further amendment to the reporting structure in the revised guidance was the requirement for a PR to be produced in all years that a USA was not

due, even when a DA was being produced (Figure 3.3). As a result of the delayed publication of the revised guidance and the substantial changes that they required, local authorities were given some leeway in submitting their Round 4 USAs on time. To assist local authorities with the additional reporting burden, templates were also produced for the USAs and PRs. A further change affecting this Round was the structural changes to local government in England that were enacted in 2009, in which nine unitary authorities were created from previous two-tier authorities. As of November 2010, 96% of USAs had been appraised and 40% of those local authorities were proceeding to a DA (Appendix 3. Table 4), the majority of which were for NO<sub>2</sub>, on the basis of monitoring data and road transport in response to the new assessment criteria that had been introduced in LAQM.TG(09) (Barnes *et al.*, 2010b).

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**Figure 3.3: LAQM reporting schematic (Round 4 onwards) (derived from LAQM.PG(09))**

As these report statistics indicate, five years after the deadlines prescribed in the Air Quality Regulations had passed, exceedences of objectives for traffic-related pollutants did not appear to be diminishing. The rate of AQMA declarations has slowed since the initial Round (Appendix 1 Appendix 4:), and although some of these have been amended, there have been very few complete revocations, especially where traffic is the primary source, and none for NO<sub>2</sub> on the basis of the implementation of AQAPs (Moorcroft and Dore, 2013).

### **3.4. Summary**

This chapter has critiqued the role that local authorities have played in monitoring and modelling and reporting on air quality in their areas through Review and Assessment. The following chapter critically examines the actions taken in pursuit of the air quality limit values and objectives, nationally and locally, and considers the criticisms that action planning has received in reviews of LAQM.

## CHAPTER 4. ACTION PLANNING

### 4.1. Chapter overview

This chapter will begin with a critical examination of the National Air Quality Strategy which sets out the roles of central and local government in reducing air pollution. These respective roles are then examined in more detail to indicate the types of measures that were implemented by each, before critically discussing some of the assessments that have been made of the current process and presenting these in the context of international experiences of local air quality management.

### 4.2. National Air Quality Strategy

The first National Air Quality Strategy (NAQS) stated the government's expectation that universally applied policies should be sufficient to achieve the air quality objectives for most of the country and that the role of LAQM should be in supplementing and "fine tuning" central policies at local hotspots where national measures would be too blunt or expensive (Department of the Environment, 1997). The NAQS predicted that emissions and fuel quality standards would almost achieve the lower threshold of the estimated 48-62% NO<sub>x</sub> emissions reductions required to meet the 2005 objective deadline, but that more stringent standards and a reliance on local measures would be required to prevent a renewed increase in emissions resulting from the predicted growth in vehicle use post-2010.

By 2004, a year before the objective dates were reached, an evaluation of the NAQS suggested that national policies may have reached their limit with respect to reductions in ambient nitrogen dioxide concentrations and that local measures were likely to be a more cost-effective way to meet the air quality objectives in remaining urban road traffic hotspots (Watkiss *et al.*, 2004). Alternatively, the report suggested, a more cost-effective strategy would be for national measures to focus on NO<sub>x</sub> emissions, rather than NO<sub>2</sub>, to reduce the regional health and ecosystem effects of nitrates and ozone.

Emissions reduction strategies encompassing technical controls, such as vehicle emissions and fuel quality standards, and economic instruments, such as reduced duty on cleaner fuels have been employed through the implementation of EU Directives and UK legislation (Table 2.1). Despite recognition that achievement of the air quality objectives would require "substantial reductions from the transport sector", the government did not propose to set sectoral targets for reduction of emissions that may conflict with and inhibit the emphasis on cost-effectiveness of implementations (Department of the Environment, 1997).

The greatest emissions reductions have been for lead, sulphur dioxide and benzene achieved through fuel quality standards imposed by Europe. Together with incentivising reductions in fuel duty, these pollutants were virtually eliminated from vehicle emissions by 2001 (Watkiss *et al.*, 2004). Possibly the most important implementation for reductions of nitrogen dioxide and PM<sub>10</sub> has been the adoption of European emission standards. Between 1990 and 2011, UK NO<sub>x</sub> emissions reportedly fell by 64%, largely as a result of new fuel and engine technologies (Defra, 2013d). However, recent evidence suggests that those NO<sub>x</sub> estimates may be understated by as much as 25% as NO<sub>x</sub> and primary NO<sub>2</sub> emissions from Euro standard vehicle classes have not reduced by as much as predicted, and that the greatest decreases in nitrogen dioxide expected with the latter Euro standards has been confounded by an increase in the proportion of primary NO<sub>2</sub> from diesel vehicles effectively caused by the implementation of these technologies (Carslaw and Rhys-Tyler, 2013; Beevers *et al.*, 2012; Brunekreef *et al.*, 2012; Carslaw *et al.*, 2011; Rhys-Tyler, Legassick and Bell, 2011; Williams and Carslaw, 2011; Carslaw, Beevers and Bell, 2007).

#### **4.3. National air quality action plans**

The UK failed to meet the 1<sup>st</sup> January 2005 deadline for achieving the EU limit values for PM<sub>10</sub> in eight of its 43 zones. In May 2008 Defra applied to extend the deadline for compliance to June 2011, following provision made in the AAQD 2008/50/EC permitting member states to do so. Having twice failed to meet EU deadlines for submission of supporting evidence, Defra's application was eventually rejected for areas of Greater London in December 2009. In May 2010, Defra submitted an update outlining further actions to meet the PM<sub>10</sub> limits in London by June 2011. In March 2011, the update was accepted on the condition that short-term measures were included in the London Action Plan. This short-term Action Plan was submitted in December 2010 and accepted in July 2011. In their latest Compliance Assessment report to the EC, Defra stated that during 2012 all zones met the limit value for daily mean concentration of PM<sub>10</sub> particulate matter, after the permissible subtraction of the contribution from natural sources.

In January 2010 the EU limit values for nitrogen dioxide also became due. In September 2011, Defra submitted a Time Extension Notification (TEN) to the European Commission which set out Action Plans for 23 Zones and Agglomerations with measures to reduce concentrations of NO<sub>2</sub> by 2015 (Defra, 2011). (An additional 17 Zones and Agglomerations that were not likely to achieve the limit value within the allowable extension period were not included in the application.) For the first time these national Action Plans included AQAPs developed by local authorities and an explicit



intention to promote the uptake of local LEZs. However, to date, no specific incentives or prioritisation strategy have been forthcoming with implementation ultimately left to local authorities' discretion. On 25<sup>th</sup> June 2012, the European Commission announced their rejection of the UK's TEN for 12 of the Zones and Agglomerations (52% of those included in the application) due to unsubstantiated action plans (European Commission 2012). At the time of writing it is not yet clear what the implications of this will be, nor how this finding will affect the 17 Zones and Agglomerations that were not included in the TEN. However, there is the risk of financial penalties on the UK Government until they are able to demonstrate compliance.

The UK Government also faced legal action from the environmental law group ClientEarth, which took the Secretary of State of the Environment, Food and Rural Affairs to the High Court and the Court of Appeal for breaching the UK's constitutional duty to adhere to Directive 2008/50/EC. The Courts, ruled that the decision to take action against the government rested with the EC; however, in May 2013, the Supreme Court upheld ClientEarth's claim that the Government was in breach of the Directive (*R v Secretary of State for the Environment, Food and Rural Affairs* [2013] UKSC 25) and referred questions about the intended interpretation of Article 23 of the Directive 2008/50/EC (Court of Justice of the European Union, 2013).

Defra (2011) claim that the main reason for the continued exceedences is due to the failure of Euro standard engines to achieve the expected reduction in NO<sub>x</sub> and, significantly, primary NO<sub>2</sub>, in real-world cycles. Older Euro standard vehicles' (1 and 2) emissions are falling, while the use of oxidation catalysts and particle filters in (Euro 3, 4, III and IV) vehicles and the greater proportion of diesel engines (14% in 2000, up to 46% in 2010) has increased primary NO<sub>2</sub> emissions. Carlaw *et al.*, (2011) note that, due to slow vehicle fleet turnover, many of these vehicles are likely to remain in circulation for the next 10 years and it is therefore critical that forthcoming Euro 6 (from September 2014) and EURO VI (from 31<sup>st</sup> December 2013) standard engines perform better in real-world cycles than their predecessors.

There were a number of proposed and existing measures included in Defra's TEN application for NO<sub>2</sub> which are purported to have, albeit unquantified, air quality benefits, including:

- Grants to encourage modal shift of freight from road to rail and water.
- Grants to encourage retrofit of emissions reduction technologies for freight vehicles.

- Guidance and research on out-of-hours delivery scheduling and freight consolidation schemes.
- Rail subsidies to incentivise passenger modal shift.
- Franchise requirements to minimise rail impact on air quality.
- Merchant Shipping Regulations to reduce emissions in line with Annex VI of the MARPOL convention.
- Vehicle emission testing.
- Tax incentives and certification for HDVs and buses to encourage uptake of newer Euro standard engines.
- Green Bus Fund to replace older buses with Euro 5 (hybrid/electric) vehicles.
- Grants to encourage implementation of smart and integrated public transport ticketing.
- Free bus travel for older people.
- Grants to facilitate commuter and school travel cycling.
- Research, guidance and grants to assist local authorities in implementing 'smarter choices' measures as part of sustainable travel plans, e.g. Local Sustainable Transport Fund.
- Integrated Transport Block Capital Grant/ Local Transport Plan Framework funding.
- National Indicator 194 on PM<sub>10</sub> and NO<sub>x</sub> emissions from local authority operations.
- Motorway Active Traffic Management to reduce congestion.
- Support for the Local Air Quality Management Framework.
- Grants and research to encourage alternatively fuelled vehicles and infrastructure.
- Fuel duty incentives for ultra-low sulphur fuel.
- Guidance to assist local authorities in managing industrial emissions through IPPC.
- A range of incentive schemes to reduce domestic and organisational energy use and promote alternative energy sources, e.g. Renewable Heat Incentives, boiler scrappage and forthcoming smart meters.

This list represents schemes across the UK or in England implemented from 1999 or proposed for imminent and future implementation (Defra, 2011). As expected many of the schemes are transport related incentive schemes aimed at freight, bus companies, local authorities and the general public to encourage use of cleaner fuels and

technologies and sustainable modal shift. It is not possible to assess the potential air quality impact as the majority of the measures presented are not quantified, and probably not quantifiable with any degree of accuracy. Many of the schemes are led by DfT or DECC, and most of the measures listed have an alternative primary focus, e.g. reducing congestion or CO<sub>2</sub>, with air quality benefits as ancillary. The only measure exclusively targeted at improving air quality is the support of the LAQM Framework.

#### **4.4. Local air quality action planning**

NCSA guidance published at the end of Round 1 provided practical ideas and methodologies for local authorities in constructing Action Plans, including a wall chart of suggested measures (NCSA, 2001; NCSA, 2000b). The Action Plan should focus on the source, as identified in the Stage 4 report, and measures should be prioritised for implementation according to their cost effectiveness, predicted air quality improvement, non-air quality impacts, how they would be perceived by stakeholders and the practicability of implementation (Appendix 1 Appendix 5:). Consultation and steering groups were advocated from the outset to gain support from the public, politicians, local commercial interests and participants who would be key players in the implementation of measures. Suggested traffic measures ranged from Compulsory Purchase Orders, Low Emission Zones and traffic management schemes, to Green Travel Plans and Bus Quality Partnerships. Clearly the ability of local authorities to implement some of these measures would be dependent on available resources (Appendix 1 Appendix 6:).

Defra have offered financial support to local authorities in England for LAQM since the programme began in 1997. Initially a total budget of ~£2 million per annum was made available through Supplementary Credits Approvals (SCAs) and latterly Supported Capital Expenditure (Revenue) (SCE(R)). In 2006/07, this changed to a direct grant scheme (under section 31 of the Local Government Act 2003), though the available funds remained largely unchanged<sup>11</sup>. This funding is intended to support capital expenditure, in particular in implementing Air Quality Action Plan measures. Recipients of air quality grants are required to submit reports to Defra indicating progress made on the proposed plan for which funding was provided to ensure they are delivering value for money. Contributions have also been made for revenue expenditure throughout the

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<sup>11</sup>In 2011/12, Defra provided over £3 million in funding to local authorities, covering 77 projects, with a further £3 million in 2012/13, funding 71 projects (Beattie *et al.*, 2013). Initial funds of just £1 million have been awarded for 2013/14, funding 28 local authorities between £10,000 and £60,000 each (Defra, 2013e).

programme via the Revenue Support Grant (RSG) Settlement. Local authorities are also able to obtain financial contributions towards specific measures from local developers by agreement under section 106 of the Town and Country Planning Act 1990, as stated in Planning Policy Guidance 23; Annex 1: Pollution Control, Air and Water Quality Planning Obligation, now superseded by the National Planning Policy Framework.

#### **4.4.1. Evaluations of local air quality action planning**

The 2010 'Review of Local Air Quality Management' (Faulkner and Russell, 2010, p.5) highlighted that, in contrast to the structured reporting mechanism of the diagnostic Review and Assessment process, "...the action planning and delivery elements of LAQM are not thought to be working well". Based on local authority questionnaire responses, conducted by UWE as part of the LAQM Review, and discussions with other key players in air quality policy, the consultants highlighted insufficient political and public support, a necessary reliance on other departments and agencies, and inadequate powers or resources as the main reasons behind the failure of action planning to deliver air quality improvements. However, the consultants also suggested that the burden of responsibility for reducing air pollutants may be misplaced, indicating that a stronger lead from central government was required to reassess the contribution that local government could reasonably be expected to make, and prescriptive guidance and support to allow them to implement those measures that are considered to be within the scope of local authorities (Barnes *et al.*, 2013; Hayes, Chatterton and Laxen, 2009).

The shortcomings of the action planning process were not a recent revelation however; as the specified attainment dates for the PM<sub>10</sub> (31<sup>st</sup> December 2004) and nitrogen dioxide (31<sup>st</sup> December 2005) UK objectives passed it had become apparent that progress was not occurring at the required pace (Hassan *et al.*, 2006; Longhurst *et al.*, 2006). This was further demonstrated by the lack of AQMA revocations on the basis of action plan implementation (Moorcroft and Dore, 2013; Chatterton *et al.*, 2006). Local authority respondents to the 2004 and 2007 evaluations of action planning support had cited an inability to engage both internal and external stakeholders in developing and implementing action plans, insufficient powers and resources and a lack of political support and technical guidance as hindering factors (Bureau Veritas and Transport Travel Research Ltd, 2007; Hassan *et al.*, 2006). Some contributory factors are discussed below.

1) Measures outside the remit of local authorities (lack of external collaboration)

Local authorities do not have the means to implement all measures included in the Action Plans. Some measures are attributed to outside agencies and require the engagement of these organisations with local authorities for the latter to determine whether the measures have been implemented and to assess their likely impact. In many cases the impact of measures outside of their remit may be too complex for local authorities to be able to assess with any degree of accuracy (Bureau Veritas and Transport Travel Research Ltd, 2007). This is particularly the case in considering measures to reduce traffic-related pollutants. Management of local roads is the responsibility of county or unitary authorities, and thus will require communication and cooperation from transport planners from within their own and neighbouring authorities, which in itself may be challenging (Olowoporoku *et al.*, 2010; Beattie *et al.*, 2006). However, control over these roads is also influenced by the national road network of motorways and A-roads, which themselves can contribute towards air quality exceedences at relevant receptors. These roads are managed by regional Highways Agency offices under the auspices of the Department for Transport (DfT), whose national transport policies ultimately govern the volume and quality of traffic on the roads (Chatterton *et al.*, 2006).

2) Lack of managerial frameworks (lack of internal collaboration)

Respondents to the 2007 evaluation of action planning support reported that one of the main limitations to the effectiveness of action plans was the lack of liaison and commitment from internal departments and members. Again, this was particularly so in the case of action plans that had been developed in conjunction with the Local Transport Plan where it was felt that the main transport agenda had already been set through the Local Transport Plans based on local political decisions rather than single issues such as air quality. These issues were reiterated in the 2010 internal review of LAQM, in which respondents' concerns included a reliance on other departments and agencies, and inadequate powers or resources (Faulkner and Russell, 2010).

According to (Beattie, 2003, p.236), the majority of local authorities do not have the strategic managerial frameworks in place necessary to implement review and assessment and, in particular, action planning effectively. Insufficient time is allowed to develop frameworks to enable measures designed to improve air quality to be implemented effectively. Among Beattie's recommendations was a suggestion that local authorities should adopt a more corporate strategic approach to air quality management and change their focus from review and assessment to the implementation of 'solutions packages'. The 2010 LAQM Review in-house consultants

supported the need for cross-departmental cooperation, highlighting ‘health’, ‘transport’, ‘land-use planning’ and ‘climate change’ as the four policy areas most closely linked to air quality, but suggesting that the lead for this should be national (Faulkner and Russell, 2010). The House of Commons Environmental Audit Committee also recognised the need for interdepartmental cooperation at a national level (House of Commons Environmental Audit Committee, 2010). Defra and DfT were, until the termination of Public Service Agreement 28, the only government departments with a remit for air quality. However, in their 2010 Air Quality report the EAC MPs also strongly implicate DCLG, DoH, DECC and the Treasury in contributing to air quality problems, and therefore their solutions.

### 3) Emphasis on review and assessment over action planning

Some criticism was received by the In House Policy Consultants’ responsible for the 2010 LAQM review regarding the burden of review and assessment reporting on local authorities. Although the level of central reporting was identified as contrary to government policies advocating devolved responsibility for local policies, it was recognised as a valuable and necessary diagnostic tool, requiring only modest reform. This point especially has renewed relevance in relation to the current LAQM consultation discussed in section 2.4.4.

### 4) Difficulties prioritising measures on the basis of cost-effectiveness assessments

According to the Defra evaluation of action planning support (Bureau Veritas and Transport Travel Research Ltd, 2007), a slim majority of local authorities (57%) had managed to undertake a simple cost-effectiveness exercise to prioritise measures within their action plan. Those that had not, reported the following barriers:

- a. a lack of guidance at the time of drafting the Plan (this may be particularly relevant to early Air Quality Action Plans),
- b. reliance on information from external agencies,
- c. the complexity of undertaking an assessment of air quality impacts, and
- d. a lack of statutory responsibility to meet national air quality objectives.

A further review undertaken in 2011 (Hindley, Clegg and Whall, 2011) similarly revealed that the situation had not improved, highlighting the availability and accessibility of information to support AQAP development as problematic, and an absence of real-life examples demonstrating the emissions reduction or air quality improvement. The report recommended that Defra consider developing measures-based Action Plan tools to assist local authorities in identifying measures suited to their particular circumstances.

Local authorities are not legally obliged to achieve the national air quality objectives. They are, however, required to work towards meeting the objectives by drawing up air quality action plans which set out the measures they intend to take in pursuit of them. The legislation was framed in this way because, in the government's view, it would be unreasonable to put a legal requirement on local authorities to achieve the objectives, because so many of the sources of emissions are outside of their direct control. This is particularly the case where a likely exceedence is due to traffic on a trunk road or motorway, or to emissions from an industrial process regulated by the Environment Agency.

During the 2010 LAQM Review, and previous action planning evaluation surveys, some local authorities and commentators suggested that it is this lack of judicial power behind action plan measures that has undermined their effectiveness, as it is perceived by stakeholders as devaluing the importance of air quality management (Hayes *et al.*, 2009a). The 2010 Review consultants echoed the sentiments of central government stated above (Faulkner and Russell, 2010), though MP Jim Fitzpatrick suggested that those local authorities that had failed to meet the LAQM objectives should contribute to the fine that the UK government may be subject to for failing to meet the EU limit values for PM<sub>10</sub> and NO<sub>2</sub> (Pease, 2009), perhaps foretelling the *Localism Act* (2011) clause which has now set that possibility in law. Whether this risk of fiscal redress will raise the profile of air quality management in local authorities sufficient to prioritise AQAP measures remains to be seen, particularly given the financial burden already imposed by the Comprehensive Spending Review and the removal of many transport initiative funds.

In 2013, nine Defra grant-funded AQAP measures were reviewed (Beattie *et al.*, 2013), including two from Oxford City Council and City of York Council (referred to later in this thesis as case study local authorities). A recurrent theme that was noted by the authors was the difficulty in quantifying the air quality impacts of measures with a large proportion of the measures reviewed unlikely to have a direct impact on air pollutant concentrations, calling into question the intended purpose of the Defra air quality grant.

#### **4.4.1.1. SMART objectives**

Local authorities are expected to identify the required reduction in pollutant concentration and to estimate a timescale for achievement. They are also expected to evaluate Action Plan measures using indicators, such as traffic flow and journey times, to determine whether anticipated aims are being achieved. As highlighted above, many



local authorities have found difficulties in implementing these requirements, which could be likened to the definition of 'SMART objectives'.

The earliest cited use of the term 'SMART objectives' is (Doran, 1981). Using the acronym SMART, Doran (1981) suggests that effective objectives should be:

- Specific – target a specific area for improvement
- Measureable – quantify or at least suggest an indicator of progress
- Assignable – specify who will do it
- Realistic – state what results can realistically be achieved, given available resources
- Time-related – specify when the result(s) can be achieved.

Doran (1981) does not suggest that all five criteria should be applicable to all objectives, but that the closer objectives adhere to the components of the acronym the smarter the objective will be.

The SMART approach to goal setting has been adopted and adapted by advocates in numerous disciplines, e.g. public relations (Langley, 2009), professional development (Tofade *et al.*, 2012), education (Jung, 2007) and medicine (Kollef, 2007). Few, if any, examples, however, could be found for its application to environmental management plans, including air quality action plans.

The original definitions of the acronym have often been amended to suit the specific users' needs, e.g. Achievable instead of Assignable, Relevant instead of Realistic, and Tangible for Time-related; however some have challenged the prescriptive nature of SMART objectives altogether as being restrictive, limiting and outdated (Brown, 2012; Dryburgh, 2011).

#### **4.5. International air quality management experiences**

While the focus of this research is on UK local air quality management, it is useful to contextualise this experience from an international perspective. As has been reported in Chapter 2, the impacts of air pollution, and traffic-related pollution specifically, has been widely demonstrated through the numerous social epidemiological papers published on the health effects of air pollution, public exposure and accountability studies (Raaschou-Nielsen *et al.*, 2013; Zhang and Batterman, 2013; Yim and Barrett, 2012; Goodman *et al.*, 2011; Autrup, 2010; Sucharew *et al.*, 2010; Shin *et al.*, 2009; Brook, 2008; Craig *et al.*, 2008; O'Neill *et al.*, 2003; Mitchell, Namdeo and Kay, 2000). Few, however, have sought to measure the impact of interventions on local air quality,



and those that have, have mainly relied on modelling studies (Acero *et al.*, 2012; Giannouli *et al.*, 2011; D'Elia *et al.*, 2009; Fernández-Bremauntz, 2008).

Problems identified in these papers include poor implementation of air pollution measures due to a lack of resources and interest by local authorities in Mexico (Fernández-Bremauntz, 2008); adoption of measures that did not result in large reductions in pollutants (i.e. Low Emission Zones (LEZ)) and a lack of implementation of measures that were considered to have greater impact (i.e. incentives for new diesel heavy duty vehicles) in Italy (D'Elia *et al.*, 2009); and poor planning of a small-scale LEZ in Spain such that it was influenced by emissions generated outside (Acero *et al.*, 2012). These reports of lack of resources and implementation of measures with alternative political priorities accord with the UK experiences highlighted previously in this chapter, and reveal that management of local air quality faces similar challenges in urban areas globally.

The lack of available literature that has comprehensively linked implementation of local action plan measures with changes in monitored local concentrations of air pollution, however, clearly demonstrates that this thesis presents a novel approach for examining the effectiveness of local air quality action planning.

#### **4.6. Summary**

This chapter has critiqued the respective roles of national and local government in the UK with respect to air quality action planning and highlighted some of the challenges faced by local authorities, including difficulties quantifying action plan measures, inadequate power and resources to implement significant actions, a reliance on departments and organisations with other priorities and a lack of political and public support. These are issues that have also been shown to be evident in other countries.

While this research is a retrospective critique of the effectiveness of local Air Quality Action Plans, future air quality policy will have implications for the recommendations made thereon. Whatever the future of LAQM, the government will still have an immediate obligation to meet the EU limit values. This research will help to identify whether limited local government resources are an effective means of achieving this, or indeed whether they are vital to improving public health at a local level.



## CHAPTER 5. CRITICAL REVIEW OF THE METHODOLOGY

### 5.1. Chapter overview

This chapter sets out the philosophical perspective of the methodology before critically discussing the specific research methods used, including rationales for the sample selection.

### 5.2. Philosophical distinctions

There are traditionally two main epistemological approaches to conducting research: a positivist approach of scientific enquiry whereby the researcher identifies a clear research question from a review of the relevant literature and formulates an experimental design to statistically test a hypothesis that will seek to *deduce* an answer to that question; or an interpretivist approach, e.g. phenomenology, whereby the researcher empathetically explores subjective phenomena through interviews or case studies and seeks to *induce* a hypothesis based on generalisations drawn from observations of usually, single or small group cases (Saunders, Lewis and Thornhill, 2012). These are two fundamentally different concepts, the methods of which are typically associated with physical science and social science respectively. Both approaches have their advantages and disadvantages. For example, positivism could be accused of falsely standardising the world in order to make generalisations that are meaningless in an ever-changing and subjective reality. Interpretivism, however, can be described as lacking scientific rigour and therefore having little or no wider objective application. Viewed from opposing perspectives, the criticisms aimed at one viewpoint are taken as the strengths of their own, i.e. a positivist approach facilitates comparability through scientific rigour enabling reproducibility, whereas an interpretivist approach provides greater insight and therefore understanding of a particular issue.

Despite the fundamental nature of these opposing viewpoints, one could argue that it is meaningless to artificially divide research into these philosophical constructs as they can and do each exist simultaneously and so are not mutually exclusive and can indeed be complementary. While the epistemology traditionally underpins the nature of the research question and defines the methodological approach, it could also be the case that the research question proposed defies strict definition and transcends this simplistic (false) dichotomy. This 'pragmatist' viewpoint is the precursor for the 'mixed methods' or 'triangulation' approach (Fielding, 2012; Saunders, Lewis and Thornhill, 2012; Åsberg, Hummerdal and Dekker, 2011; Hagger and Chatzisarantis, 2011; Fielding, 2010; Hesse-Biber, 2010; Symonds and Gorard, 2010; Bryman, Becker and

Sempik, 2008; Bryman, 2007; Johnson, Onwuegbuzie and Turner, 2007; Prakash *et al.*, 2007; Kelle, 2006; Brannen, 2005).

### **5.3. Research methods**

Much research in air quality management has utilised this triangulation approach, complementing quantitative report appraisals and questionnaire data with qualitative case studies and interviews (Olowoporoku, 2010; Gegisian, 2007; Hassan, 2006; Leksmono, 2005; Redder, 2004; Woodfield, 2004; Beattie, 2003). As a discipline that comprises science and policy, this combined approach is well-suited to air quality management enabling practitioners' experiences to inform conclusions drawn on the data.

Ultimately, this study has adopted a positivist approach, examining available data and deductive reasoning in response to Objective 1 (i.e. to determine trends in local NO<sub>2</sub>), pragmatically tempered with interpretivist perspectives recognising the value of personal experience and the experiences of the case study local authorities in response to Objective 2 (i.e. assessing whether AQAP measures have been implemented). Interviews and questionnaires were not utilised. This was partly due to the period of time covered by the research in relation to the turnover of employees in air quality management practitioner roles, which would make it difficult to identify individuals with whom to conduct interviews with the necessary length of experience to reflect on the implementation of Round 1 Action Plans. Also, a substantial questionnaire study of air quality management practitioners was undertaken by the AQMRC, UWE, Bristol, in late 2009 as part of an independent review of the LAQM process (Barnes *et al.*, 2013; Faulkner and Russell, 2010; Hayes, Chatterton and Laxen, 2009) and it was not considered that an additional survey would add significant value.

The timescale for the data used in this research covers 12 years, beginning in 2000 with the first AQMAs declared as a result of predicted exceedences of the national air quality objectives in Round 1 of the Review and Assessment process, and charting the progress of the resulting Action Plans and measured pollutant concentrations through Rounds 2, 3 and 4 and the beginning of Round 5 (up to 2013). The following sections critically analyse the methods employed to address the research areas identified above, beginning with a critique of the sample selection.

#### **5.3.1. Sample selection**

Objective 1 states that the research will document the change in the concentration of annual mean nitrogen dioxide from road traffic using continuous monitoring data, in

AQMAs declared in England following Round 1 of Review and Assessment. The premise behind this sample selection was to ensure comparability between the findings, i.e. by focusing on a single pollutant objective (annual mean NO<sub>2</sub>), single pollutant source (road traffic), single monitoring method (chemiluminescence) and single country (England); and to maximise the available data to analyse trends, i.e. by using only those AQMAs declared early in the LAQM process (from Round 1). This section critically examines the criteria for this sample selection.

#### **5.3.1.1. Pollutant source and objective**

119 local authorities in the UK declared AQMAs from Round 1, 91% of which were for nitrogen dioxide and 74% exclusively for traffic sources. Traffic remains the most important source of local air pollutants with 94% AQMAs currently declared for exceedences of the nitrogen dioxide annual mean objective relating to traffic (Chatterton *et al.*, 2004). The majority of AQMAs have been declared for nitrogen dioxide annual mean and 40 out of 43 UK Zones and Agglomerations failed to meet the 2010 EU limit value for annual mean NO<sub>2</sub>. Therefore, to provide a robust dataset for further analysis and to ensure the relevance and applicability of the research, the method will focus on AQMAs that have been declared on the basis of the nitrogen dioxide annual mean objective.

#### **5.3.1.2. Monitoring method and sites**

As discussed in Section 2.2, nitrogen dioxide is a health-damaging pollutant, but also acts as a proxy for other traffic-related pollutants and it is easier and less expensive to monitor than PM<sub>10</sub>. As also discussed in Section 3.2, nitrogen dioxide annual mean concentrations may be obtained from monitoring using automatic monitors, e.g. chemiluminescence analysers, or passive diffusion tubes or modelling. Automatic monitors are more expensive and less straightforward to site than diffusion tubes, but there are higher levels of uncertainty in diffusion tube data (~±25%) compared to that from automatic monitors (~±15%). Modelling data, as discussed in Section 3.2, typically has greater levels of uncertainty than monitoring data due to the numerous estimates and assumptions inherent in the methodology.

Defra and the Devolved Administrations (DAs) have operated a national Automatic Urban and Rural Network (AURN) of analysers since 1987 with a standardised Quality Assurance/Quality Control process (Defra, no date). Data from these sites are used to report to the European Commission as part of Defra's Compliance Reporting. To minimise the level of uncertainty between data relating to different AQMAs, AURN data were used wherever possible in this study. As fixed monitors, long-term data from

these sites are also more likely to be available. Data for AURN sites were obtained from the Air Quality Data Archive<sup>12</sup>.

In order to identify trends in local concentrations of nitrogen dioxide (as per Stedman *et al.* (2013) (see section 8.4.2.3, p. 183), it is necessary to obtain annual mean concentrations of nitrogen dioxide at nearest roadside and background monitoring sites. Background concentrations are largely unaffected by local measures to improve air quality, but reflect the implementation of national measures, regional climatology and annual meteorological variability in nitrogen dioxide. In order to determine the effect of local traffic measures it is therefore necessary to discount the background concentration and compare only the local source element of the roadside annual mean. There may be other extraneous factors that affect the comparability of nitrogen dioxide concentrations, e.g. site type (kerbside/roadside, urban/rural). These data were also recorded for sub-analyses of the data.

#### **5.3.1.3. Country**

One factor that may affect the availability and comparability of data are the differences between the operational timescales for LAQM between England and the Devolved Administrations. Northern Ireland, for example, did not join the LAQM process until the latter stage of Round 2 and, although Scotland, Wales and the Greater London Authorities operate on the same basic timescale as England, their Regulations and policy guidance documents vary and so practices are not wholly comparable (e.g. local authorities in England can link their AQAP and LTP). This research therefore focuses on England (excluding London) as having the largest available dataset from which to draw and the broadest applicability.

#### **5.3.1.4. Baseline**

Prior to declaration of an AQMA in Round 1, an exceedence of the pollutant was predicted based on local authority monitoring and dispersion modelling presented in a Stage 3 (S3) report (Figure 3.1, p. 23). The details and conclusions from these reports were stored in a Microsoft Access database of report appraisals held by UWE under the Defra and the Devolved Administrations Review and Assessment appraisal contract. In order to carry out analyses between data relating to different AQMAs, comparable monitoring periods for these data were therefore required. In addition, for a valid assessment of the monitoring data against the AQAP implementation, there would

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<sup>12</sup> <http://uk-air.defra.gov.uk/data/>

need to be sufficient duration for the AQAP measures to be implemented. Therefore it is necessary to identify the largest number of AQMAs declared at as early a stage in the LAQM process as possible, i.e. Round 1. The majority of S3 reports were completed in 2000 and 2001 and a preliminary examination of these reports in the Review and Assessment database was (initially) used to determine the monitoring periods and the Round 1 baseline local authorities.

### **5.3.2. Geographical Information Systems (GIS)**

Geographical Information Systems (GIS) were first developed more than 50 years ago, and have steadily gained status, *inter alia*, as a means to undertake spatial analysis of data (Goodchild and Haining, 2004). In air pollution studies, GIS has been widely used for a variety of purposes. From interpolating monitoring data to model spatial distribution of pollutants (Chattopadhyay, Gupta and Saha, 2010), to land-use regression analysis (Gulliver *et al.*, 2011), epidemiology and public exposure assessments (Merbitz *et al.*, 2012; Krajenta *et al.*, 2010), economic analyses for crop damage (Vlachokostas *et al.*, 2010), public participation (Cinderby, Snell and Forrester, 2008; Cinderby and Forrester, 2005) and as a management system (Elbir *et al.*, 2010; Puliafito, Guevara and Puliafito, 2003; Jensen *et al.*, 2001).

The use of GIS in this research is necessary in order to (ultimately) identify the relevant baseline AQMAs (verified against the Round 1 baseline identified using the Review and Assessment databases) and to determine spatial relationships between data, e.g. monitoring sites and AQMAs, and the locations of AQAP measures to AQMAs. GIS provides the analysis tools to be able to express those relationships, e.g. 'spatial join', 'buffer', 'intersect', 'summarise'. The relational database aspects of the GIS facilitate the implementation of these spatial relationship tools. Data management tools, e.g. 'select by location/attribute' and 'definition query', enable further interrogation of the attributes of these spatial datasets.

One of the key limitations of GIS is access to spatial datasets. These can be produced from primary sources, but more often, as in this case, secondary sources will need to be sought. Access to metadata for secondary sources is important in order to ascertain the original purpose of the data, the scale, projection, units, author, date, etc. so that the validity and applicability of the data for the required purpose can be verified. Often, however, metadata is not available and users must use their own judgement and interrogation of the data to determine its suitability and accuracy. There is therefore a reliance on the accuracy and completeness of secondary spatial data sources. Defra is the source for the AQMA and AURN spatial datasets in this study and, as official data,

there is an implicit assumption that the data provided should be valid and accurate. In practice, however, inaccuracies were observed in the AQMA and also the Zones and Agglomerations digital datasets provided by Defra (see Sections 8.2.1 and 8.2.2).

### **5.3.3. Case studies**

Objective 2 states that the research will evaluate whether the measures included in the Air Quality Action Plans produced following Round 1 are being achieved and whether implementation is contributing to an improvement in nitrogen dioxide concentrations. All local authorities in England (except those rated as “excellent” authorities) were required to submit Air Quality Action Plans (AQAP) 12-18 months after the declaration of an AQMA, with subsequent revisions submitted as necessary. Action Plan Progress Reports (AQAP-PR) were required to be submitted annually following submission of the final Action Plan. Final Action Plans for those AQMAs identified in Round 1 as declared for traffic-related nitrogen dioxide annual mean objective, were examined and compared with subsequent Action Plan Progress Reports to identify which measures had been completed. AQMAs may be amended or even revoked if air quality reports show that there is no longer an exceedence of the declared objective. Records of AQMA amendments and revocations were therefore checked for those LAs identified in Objective 1. The reason for any amendment or revocation was clarified in the Review and Assessment reports.

The obvious potential limitation of this plan is the availability of data in the form of AQAPs and AQAP PRs to ascertain whether there has been any implementation of measures. There will need to be sufficient time allowed between the publication of the AQAP and the final AQAP PR for any measure to be implemented and for the effect to be measurable. Linked to this limitation, therefore, there is a secondary limitation regarding the availability of relevant monitoring sites and adequate data. There is a risk that in attempting to standardise the input data to this research to facilitate comparability and applicability, that only a small number of case study AQMAs/local authorities will qualify, resulting in conclusions being drawn on a small-scale sample. Clearly, absence of data cannot be corrected for, however a clear justification for the selection of available data has been provided to counter the potential loss of applicability.

### **5.3.4. Evaluation of AQAP measures**

In addition to addressing the two key objectives, further research has been undertaken to seek to evaluate the AQAP measures against Defra’s specified requirements as set out in the statutory guidance. The SMART approach, identified in section 4.4.1.1, in



many ways, accords with Defra's statutory guidance LAQM.PG(03), to which all of the case study local authorities would have had to have regard in preparing their initial AQAPs. LAQM.PG(03) states that an air quality action plan must include the following (italic text added):

- quantification of the source contributions to the predicted exceedences of the objectives; this will allow the action plan measures to be effectively targeted; [*Specific*]
- evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility; [*Realistic*]
- how the local authority will use its powers and also work in conjunction with other organisations in **pursuit** of the air quality objectives; [*Assignable*]
- clear timescales in which the authority and other organisations and agencies propose to implement the measures within its plan; [*Time-related*]
- quantification of the expected impacts of the proposed measures and, where possible, an indication as to whether the measures will be sufficient to meet the air quality objectives; [*Realistic*] and
- how the local authority intends to monitor and evaluate the effectiveness of the plan. [*Measurable*]

It is postulated that well-formulated and considered AQAP measures are more likely to be successfully implemented. Given the difficulties, previously identified in section 4.4.1, that local authorities have experienced in quantifying measures, undertaking cost-effectiveness and engaging responsible partners to implement measures, it is proposed that each of the AQAP measures identified in this research would be assessed against the SMART criteria above to determine whether these are limiting factors in their implementation.

### **5.3.5. Personal experience**

Given that this research draws on nearly ten years of personal experience of working in air quality management research, it is recognised that it is not possible, nor would be desirable, to be entirely objective in the interpretation of the findings. While the input data has been standardised, as described above and in Chapter 6, to ensure that the deductive reasoning behind the conclusions drawn is valid and applicable, the use of insights that have been gained from practical work experience are acknowledged. This experience includes acting as a Review and Assessment report appraiser from 2008-2010, assisting local authorities with their LAQM statutory duties (including production

of AQAPs) over the last ten years, and being actively involved in developing and disseminating statutory and non-statutory guidance, as well as supporting the European Commission in developing revised air quality policy. It is therefore necessary to state this explicitly and accept that this personal experience complements the positivist leanings implicit in this research.

#### **5.4. Summary**

This chapter has placed the methodology within an epistemological context, framing the approach to the thesis statement and research objectives, and setting out a rationale and critique of the research methods presented in the following chapter.

## CHAPTER 6. METHODOLOGY

### 6.1. Chapter overview

This chapter sets out the tasks that were undertaken in implementing the methodology (Figure 6.1). There are two main sources of data to be utilised: monitoring data and Air Quality Action Plan reports. As discussed in Section 5.3.1, in order to ensure a homogeneous and manageable sample to facilitate analysis, this research focused on AQMAs declared for the NO<sub>2</sub> annual mean objective from road traffic sources, being the predominant pollutant and source for which AQMAs have been declared. This research also focuses on England (excluding London) as having the largest available dataset from which to draw and the broadest applicability. The first stage, however, was to identify those local authorities that had prepared Action Plans on the basis of traffic-related nitrogen dioxide exceedences identified in England in Round 1 (Figure 6.2).

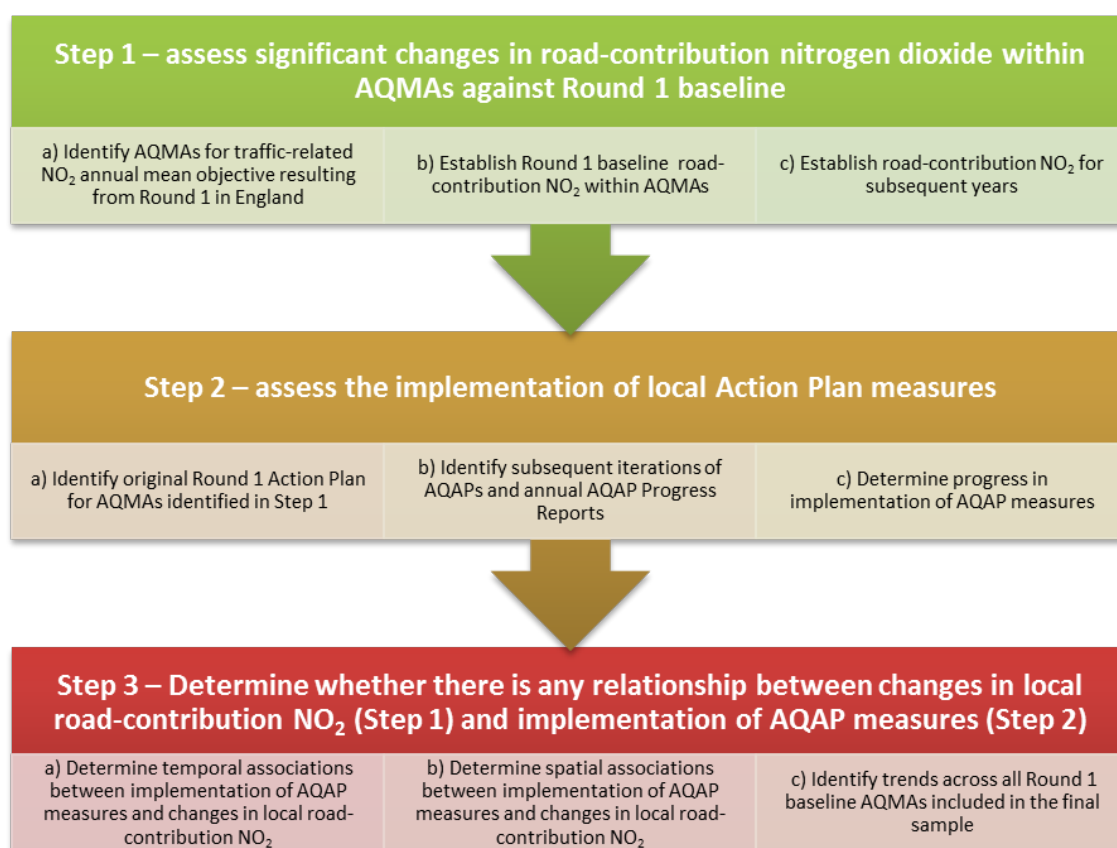
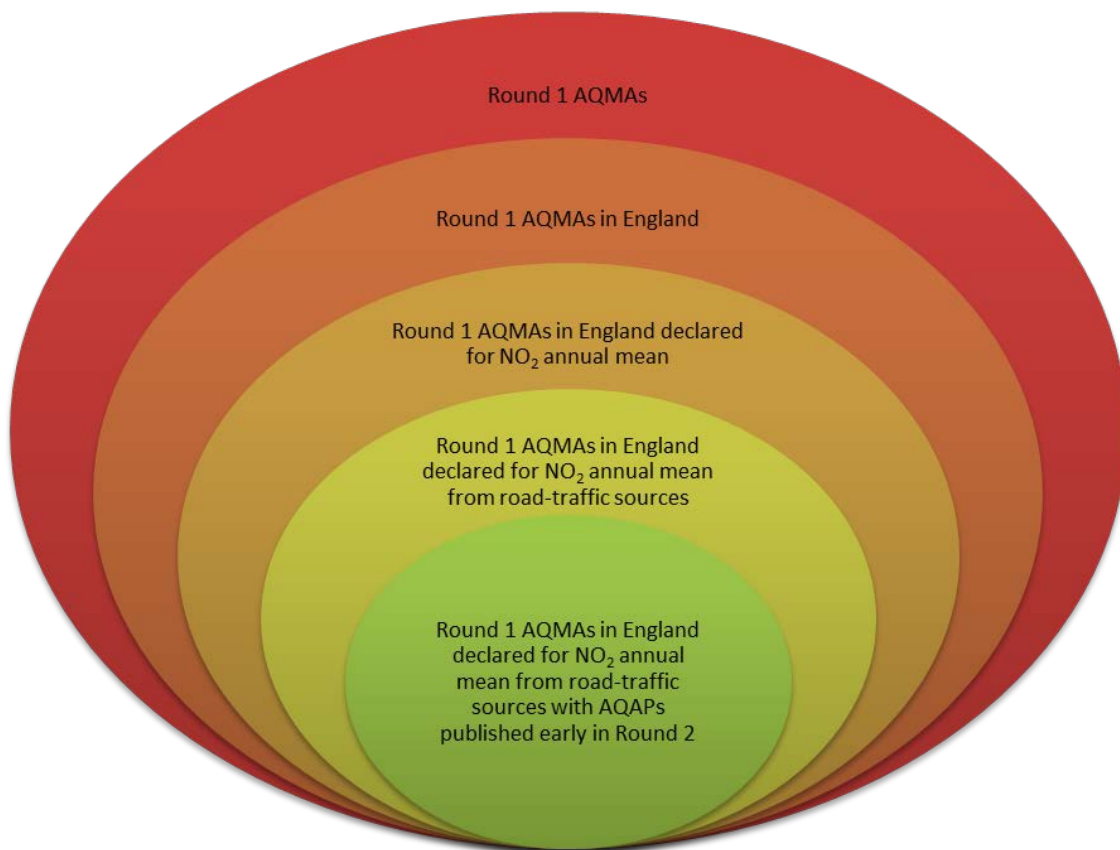


Figure 6.1: Methodology flow diagram



**Figure 6.2: Filtering process applied to the selection of Air Quality Action Plans to be reviewed**

## **6.2. Identifying the Round 1 baseline**

This section describes two approaches, using (a) the Access databases maintained by UWE under the Defra and the Devolved Administrations Review and Assessment contract (Figure 6.3) and (b) the GIS dataset of AQMAs provided by Defra, to identify those local authorities in England that had declared AQMA(s) for NO<sub>2</sub> annual mean objective in Round 1 (Figure 6.4), i.e. the Round 1 baseline.

### **6.2.1. Identifying LAs in England requiring an AQMA for NO<sub>2</sub> annual mean objective following their S3 report from the Round 1 and AQMA databases**

The Round 1 Access database comprises a number of Tables which were completed by the appraisal team as reports were received and appraised. Unlike the databases used in later Rounds, the Round 1 database did not use a front-end form for data entry and viewing so the data was only available directly from the database Tables. The Tables used to determine those Local Authorities proceeding to an AQMA from their Round 1 Stage 3 report were 'Progress Report – England' and 'P1 Designated

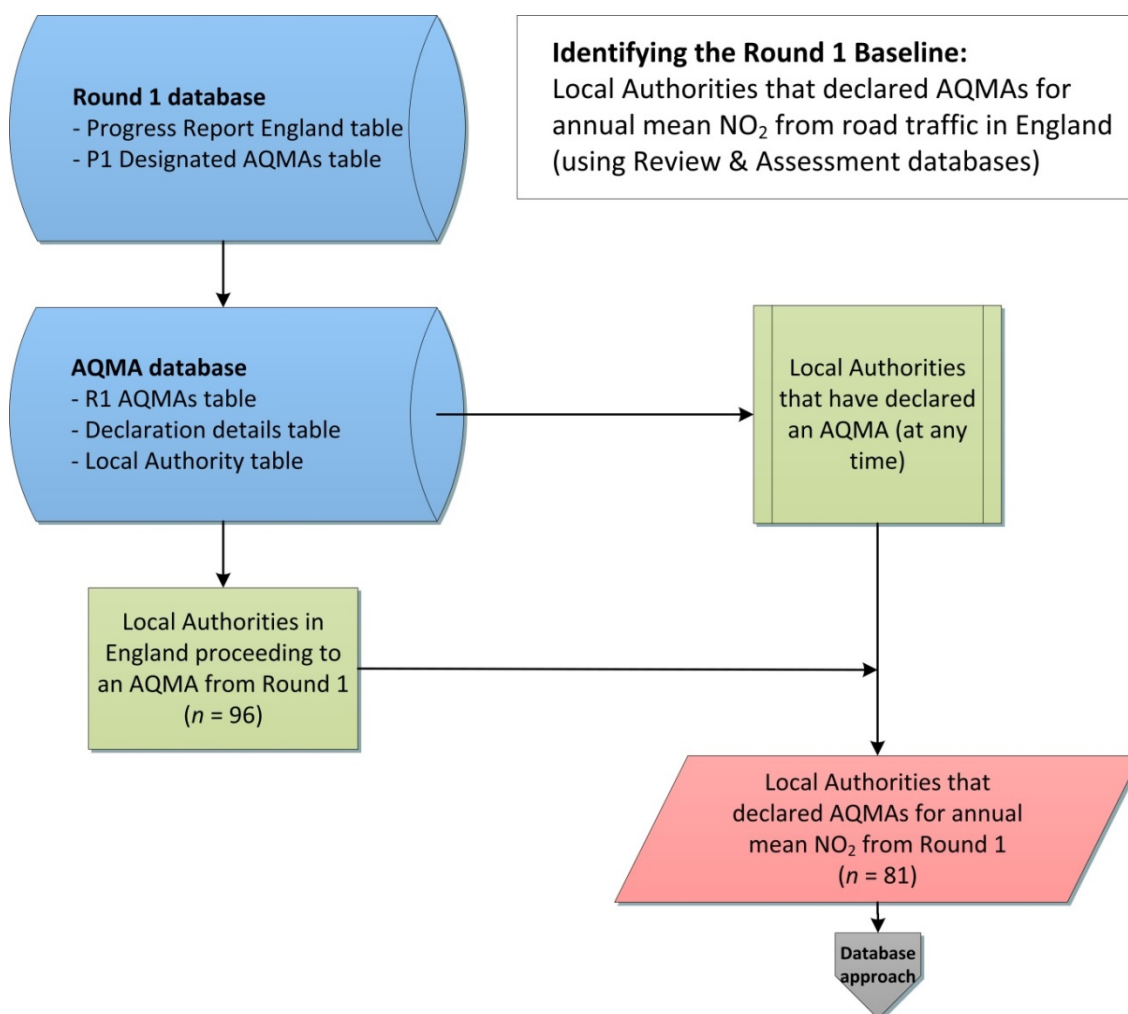
AQMAs'. These Tables were analysed in conjunction with the AQMA database Table 'R1 AQMAs', also maintained by UWE. Under the Defra Review and Assessment contract, Progress table – England (Round 1 database) was used to record all of the reports and outcomes for each of the local authorities in England in Round 1; P1 Designated AQMAs (Round 1 database) recorded the AQMA declarations for all local authorities resulting from their Stage 3 reports and the outcome following their Stage 4 reports; and R1 AQMAs (AQMA database) similarly recorded the AQMA declarations for all local authorities. Each of the Tables was filtered to determine those Local Authorities in England proceeding to an AQMA from their Round 1 Stage 3 report (Appendix 7. Table 4 to Appendix 7. Table 1). As these database Tables were produced for different purposes, and therefore were completed with differing cut-off dates, the data within were not necessarily in agreement. Although all three Tables indicated that there were 94 Local Authorities with AQMAs in England resulting from Round 1, there was some discrepancy between the Local Authorities identified in each. The lists of Local Authorities resulting from these Tables were therefore compared and any discrepancies highlighted and investigated to determine a definitive list of Local Authorities in England proceeding to an AQMA from their Round 1 Stage 3 report ( $n = 96$ ) (Appendix 7. Table 7).

The Tables in the Round 1 database did not include an LA-ID field (or any common field) so it was not possible to run a relational query between this database and the AQMA database. Instead a query was run on the 'Declaration details' and 'Local Authority' Tables<sup>13</sup> in the AQMA database by LA-ID to provide a table of Local Authorities by name that had declared an AQMA at any time. Details of the Order ID, region, status of the AQMA, declaration date, any subsequent amendment or revocation date, source, pollutant and objective for which the AQMA was declared were also included in the query. Using the list of England Local Authorities proceeding to an AQMA resulting from their Round 1 Stage 3 report, the details for each of those Local Authorities were exported into an Excel spreadsheet. These records were then filtered for those AQMAs declared for NO<sub>2</sub> ( $n = 90$ ). Of these local authorities nine were identified as having completely revoked their AQMA following evidence presented in the Stage 4 report indicating that the objective was likely to be met by the objective

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<sup>13</sup> Under the Defra contract the 'Declaration details' table was used to record the AQMA declarations, amendments and revocations; the 'Local Authority' table recorded a list of the local authorities. Both tables also listed the LA-ID field, which was used to provide a consistent short reference for all local authorities to enable relational queries between databases and between tables.

deadline (31<sup>st</sup> December 2005). These local authorities (Babergh DC, Hinckley and Bosworth BC, Melton BC, North Somerset Council, South Gloucestershire DC, St Edmundsbury BC, Stroud BC, Telford and Wrekin Council, Tewkesbury BC) were therefore discounted from the rest of the study leaving  $n = 81$ . Other AQMA revocations listed in Appendix 7. Table 7 were only partial/temporary revocations or occurred subsequent to the preparation of AQAPs; these local authorities were therefore retained in the study cohort.



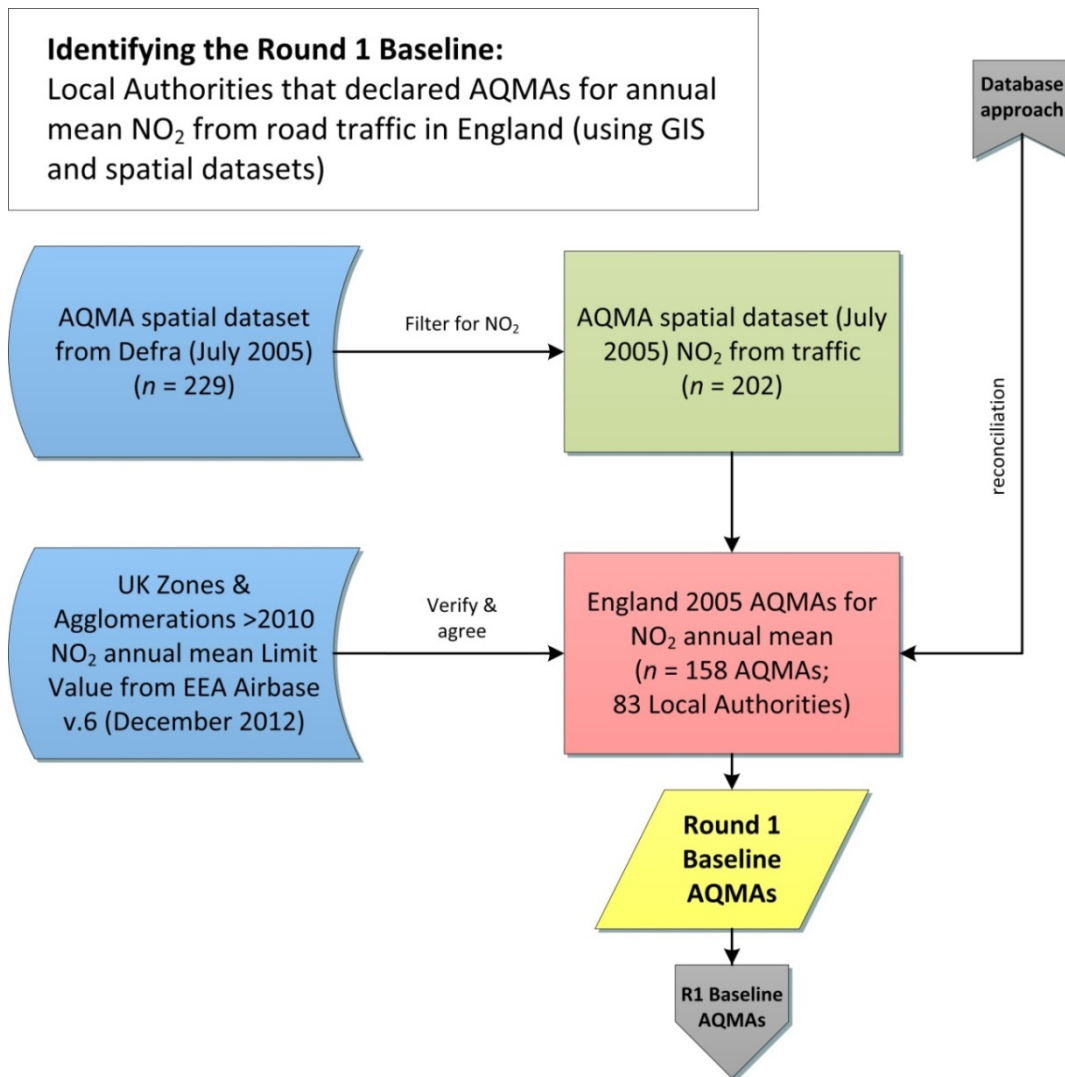
**Figure 6.3: Flow chart showing the identification of the Round 1 baseline local authorities using the Review and Assessment databases**

### **6.2.2. Identifying LAs in England requiring an AQMA for NO<sub>2</sub> annual mean objective from Round 1 using the GIS dataset of AQMAs**

While the interrogation of the Review and Assessment databases identified the local authorities that had declared AQMAs from Round 1, identification of the monitoring sites' spatial relationship to the AQMA required a spatial GIS dataset. Historical AQMA shapefiles were requested from Defra (Hryniewicz, 2012) and mapped in ESRI ArcView to determine their spatial relationships. Annual AQMA datasets were obtained for each year from 2005 to 2011. The AQMAs declared for NO<sub>2</sub> were selected from the 2005 AQMA dataset (July 2005), as the earliest available digital dataset, using an attribute selection and exported as a separate shapefile. To select those AQMAs pertaining to England, the clipped 2001 England District shapefile was downloaded from the Edina UK Borders website<sup>14</sup>. The London Boroughs were selected from the attribute table and exported as a new layer. A spatial query was run to select the 2005 NO<sub>2</sub> AQMAs that intersected the 2001 England District shapefile, thereby removing any AQMAs relating to Scotland, Wales or Northern Ireland. The London Borough AQMAs were removed from the resulting selection by running another spatial selection that removed the 2005 NO<sub>2</sub> AQMAs which had a centroid within the London Boroughs shapefile. The remaining selection, representing the England 2005 NO<sub>2</sub> AQMAs, was exported as a new shapefile. This layer contained 158 AQMAs over 83 local authorities (Figure 6.4).

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<sup>14</sup> [http://ukbsrv-at.edina.ac.uk/html/easy\\_download/England\\_dt\\_2001.html](http://ukbsrv-at.edina.ac.uk/html/easy_download/England_dt_2001.html)



**Figure 6.4: Flow chart showing the identification of the Round 1 baseline local authorities/AQMAs using the GIS-based AQMA dataset**

### 6.2.3. Comparison of database and GIS approaches

There were a number of discrepancies noted between the England 2005 NO<sub>2</sub> dataset and the list of local authorities identified as declaring AQMAs for NO<sub>2</sub> from the Round 1 and AQMAs databases. These included AQMAs declared in the early stages of Round 2 which appeared in the digital dataset but not in the database-sourced list. There were also local authorities that were identified from the databases, but which did not appear in the GIS dataset. Details of these discrepancies can be found in Appendix 7. Table 8.

These discrepancies highlighted that there were a few local authorities recorded as progressing to an AQMA in the Round 1 databases, but for which declarations were postponed until further clarification could be sought from monitoring and modelling reported in Round 2. This is understandable given that the process of LAQM was new to local and national government, and hence practices were being established



somewhat through trial and error. It was also apparent that there were a number of AQMAs declared in the early stages of Round 2 that could justifiably be included in this analysis. For this reason, it was decided that it would make more sense to use the 2005 AQMA GIS dataset as the cohort for this research; however this dataset was first amended to correct the South Kesteven AQMA details as identified in Appendix 7. Table 8.

#### **6.2.4. Spatial comparison of AQMA dataset and Zones and Agglomerations**

Zone and Agglomeration shapefiles were also obtained from Defra to determine which Zone/Agglomeration the England 2005 NO<sub>2</sub> AQMAs intersect. A spatial join was run with the Zones and Agglomerations shapefile. Unfortunately there were a number of unattributed records within the Zones and Agglomerations spatial dataset supplied by Defra, so an alternative dataset was obtained from the European Environment Agency (EEA) AirBase (v6) which represented the zones reported by member states to the European Commission for exceedences of the 2010 NO<sub>2</sub> limit values (updated December 2012)<sup>15</sup>. GB zones (excluding Gibraltar and those labelled for water bodies) were extracted from this Europe-wide dataset and re-projected from the Global Coordinate System 'WGS 1984' to 'OSGB 1936' (British National Grid). The resulting spatial join with the England 2005 NO<sub>2</sub> AQMAs was saved as a new feature class (uk\_aqmas\_july05\_NO2\_England\_zagjoin). As Zones and Agglomerations are unrelated to local authority boundaries, there were a number of AQMAs that intersected more than one Zone or Agglomeration. A summary of the findings is presented in Appendix 7. Table 6. The analysis identified that the 158 AQMAs in 83 local authorities identified in Section 6.2.2 fall within 21 of the 43 UK Zones and Agglomerations. The EEA GIS dataset also stated which zones exceeded the 2010 annual mean and hourly mean limit values for NO<sub>2</sub> (NO<sub>2</sub>h>lv). There was only one zone in England that did not exceed the annual mean (Blackpool Urban Area) and there were no AQMAs for Blackpool in the 2005 dataset. All remaining 2005 AQMAs were located within Zones or Agglomerations that were exceeding at least the annual mean limit value. The Greater London Urban Area zone, which extends beyond London to include local authorities in England, also exceeds the hourly mean limit value, which includes 11 AQMAs in 8 local authorities from the 2005 dataset (Table 6.1).

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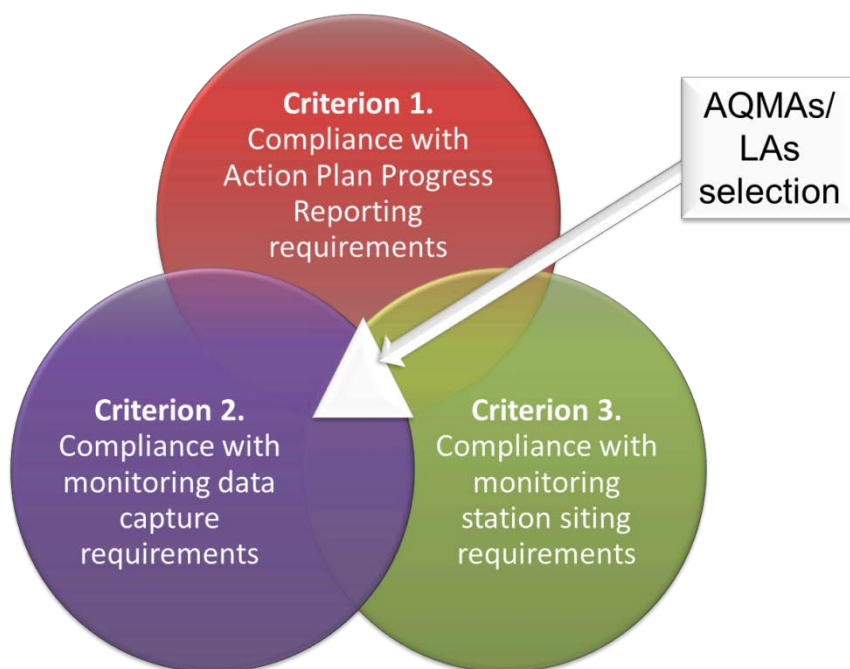
<sup>15</sup> <http://www.eea.europa.eu/data-and-maps/data/zones-in-relation-to-eu-air-quality-thresholds-4>

**Table 6.1: England AQMAs within the Greater London Urban Area, which exceed both the annual and hourly mean limit values for NO<sub>2</sub>**

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE
26	Spelthorne	54	Spelthorne AQMA
39	Broxbourne	11	Arlington Crescent
39	Broxbourne	231	Teresa Gardens
75	Dartford	19	Dartford AQMA
113	Gravesham	70	Gravesham A2 AQMA
127	Hertsmere	206	Hertsmere AQMA No. 4
215	Runnymede	48	Area 1
215	Runnymede	49	Area 2
235	South Bucks	247	South Bucks AQMA
281	Three Rivers	56	Chorley Wood NO2 AQMA
281	Three Rivers	60	Kings Langley NO2 AQMA

### 6.3. Criteria for selecting AQMAs/local authorities

The methodological approach, as set out in Figure 6.1, was to identify the trend in local road-contribution NO<sub>2</sub> over the period of the implementation of AQAPs, the implementation of measures in related AQAPs, and to critically assess the correlative relationship between them. It was therefore necessary to identify those local authorities and respective AQMAs with valid monitoring sites and NO<sub>2</sub> annual mean data relevant to their AQMAs, and that have also published AQAPs and subsequent AQAP Progress Reports to enable the implementation of measures to be assessed. A series of criteria were established to identify those local authorities and AQMAs with the information required to apply the methodological approach (Figure 6.5).



**Figure 6.5: Criteria used to identify local authorities/AQMAs used in this study**

### **6.3.1. Criterion 1: Compliance with Action Plan Progress Reporting requirements**

Air Quality Action Plans (AQAPs) pertaining to the list of England Local Authorities identified above as declaring an AQMA for NO<sub>2</sub> as identified in Section 6.2 were requested from Defra's consultants (TTR). AQAPs for 32 local authorities were obtained in electronic format. A Chain of Custody spreadsheet was obtained from the previous consultants (Ricardo-AEA), detailing all AQAPs that had been submitted up to the end of their contract (i.e. November 2010). This was used to check against the reports obtained for the local authorities identified from the databases held by UWE. The local authority websites and reports downloadable thereon, were used to cross-reference between the two lists to determine whether there were any omissions. No additional local authorities were identified that had declared an AQMA as a result of the Round 1 reports, except Kerrier District Council (now part of Cornwall Council), which, according to their AQAP, had identified the need for an AQMA for exceedences of the annual mean objective for nitrogen dioxide in their Stage 3 report. According to the appraisal records held by UWE, this report was submitted as a Detailed Assessment in Round 2 (received April 2005) and therefore does not qualify for consideration as part of the Round 1 cohort.

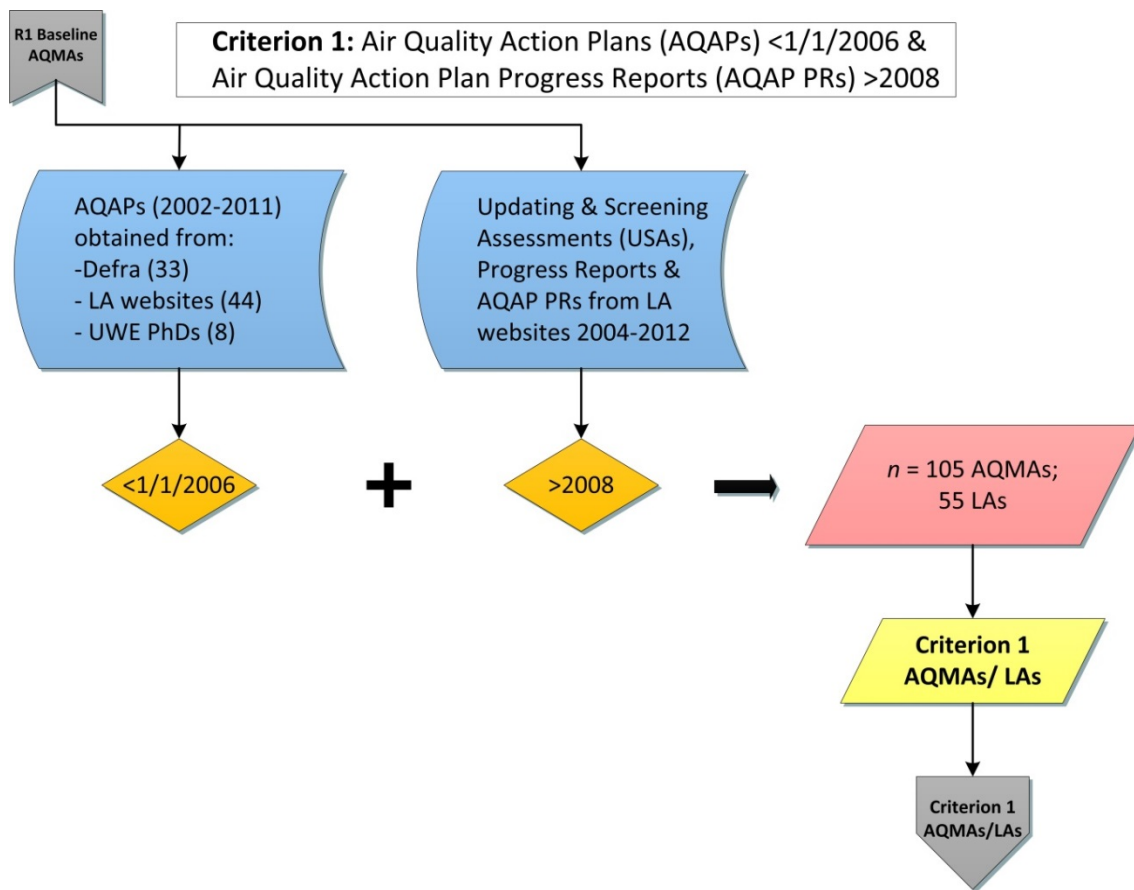
Copies of reports that were unobtainable from TTR were sought from the local authorities' websites. Reports were usually obtainable from the Air Quality pages of the Environmental Health/Environmental Protection sections of local authorities' websites, under Pollution. Where downloadable documents were not immediately apparent search engines within the local authorities' websites were used to identify any 'Air Quality' or 'Review and Assessment' reports located elsewhere on the site. In some instances reports for several local authorities were available on regional websites (e.g. Herts and Beds Air Quality Network) or in others combined reports for several local authorities had been produced (e.g. Greater Manchester). For those local authorities that have been subsumed within unitary authorities following the 2009 local government restructure, historical reports were either unavailable (e.g. Shropshire Council) or were available grouped by local authority on the new unitary authority website (e.g. Wiltshire Council).

An additional 44 AQAPs were obtained from local authorities' websites and a further six hard copy reports were available from previous UWE PhD research (to give 82 in total). No AQAPs were obtainable for one of the 83 local authorities (South Oxfordshire DC) from either source. The date range of the AQAPs obtained was from April 2002 (South Lakeland DC) up to March 2011 (Dudley MBC).

As well as AQAPs, Updating and Screening Assessments (USAs) and Progress Reports, including Action Plan Progress Reports (AQAP PRs), from Rounds 2, 3, 4 and 5 were also downloaded from local authority websites where available. These reports were visually scanned to determine whether they included updates on monitoring data, action plan measures or both, in order to ascertain the completeness of the available data (Appendix 7. Table 10). It was quickly apparent that the quality of reports appeared to have improved over the years, presumably due to the wisdom of experience, the publication of more detailed guidance and tools and the provision of report templates and good practice exemplar reports on the LAQM helpdesk websites. Later reports also included historical trend data for monitoring sites.

To maximise the potential number of AQAPs available and ensure sufficient time had elapsed since their publication against which to measure implementation of the measures therein, criteria were set on the maximum cut-off date for publication of AQAPs as 31<sup>st</sup> December 2005, and the minimum cut-off year for publication of AQAP PRs as 2009. These cut-off dates were based on the period over which reports were available (AQAPs: 2002-2011; AQAP PRs: 2004-2012) allowing a minimum of three years and a maximum of ten years for the potential implementation of the original AQAP (Figure 6.6).

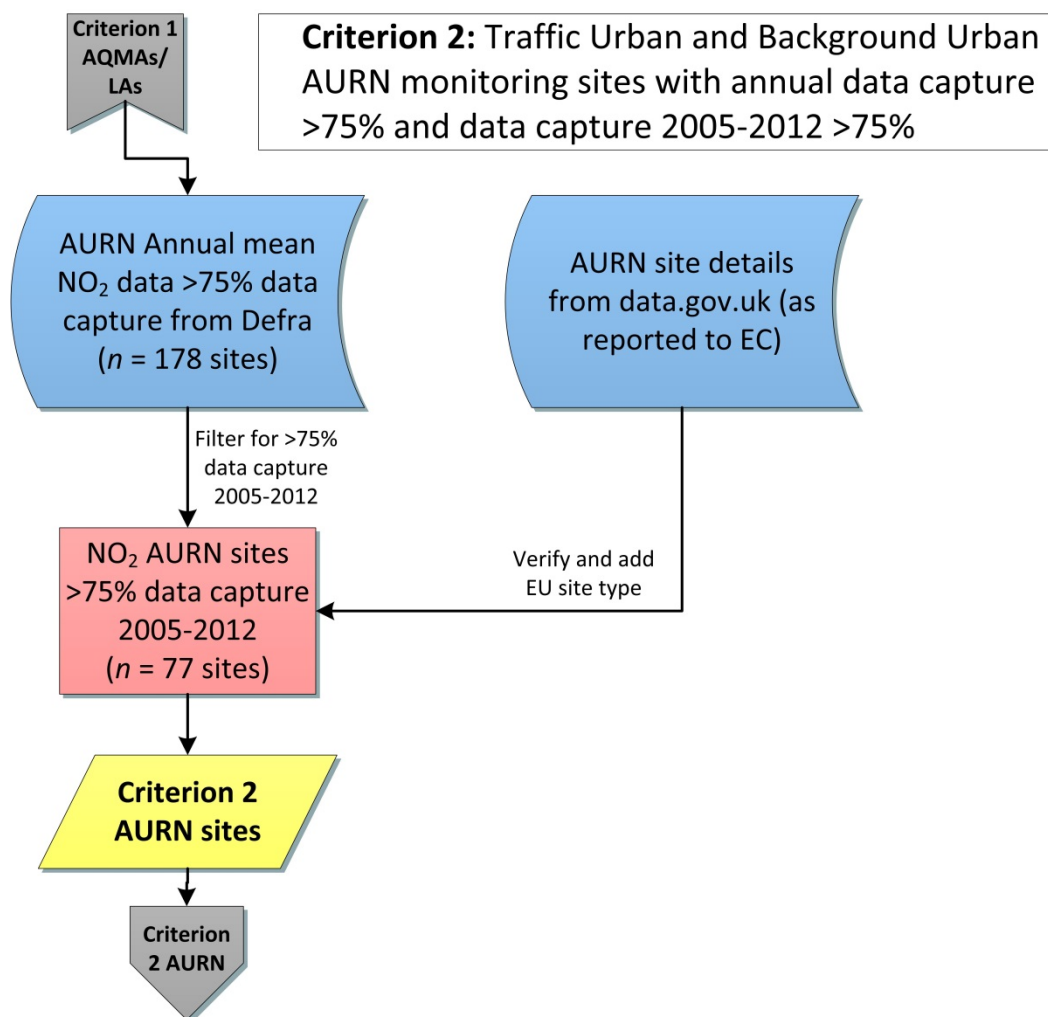
Of the 158 2005 AQMAs, there were 105 of them (covering 55 local authorities) meeting the criterion for AQAP PRs (i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in 2009 or later).



**Figure 6.6: Flow chart showing the selection process of Criterion 1: Compliance with Action Plan Progress Reporting requirements**

### 6.3.2. Criterion 2: Compliance with monitoring data requirements

Annual mean NO<sub>2</sub> monitoring data with data capture >75% for all AURN sites from 1961-2012 were downloaded from the Defra AURN website (<http://uk-air.defra.gov.uk/data/exceedence>) and reshaped from 'long' to 'wide' format using the data analysis software, R (v. 3.0.0) (Appendix 7. Box 1) (R Core Team, 2012). These data were filtered for sites with >75% data capture for the period 2005-2012 (i.e. at least six years' data), to provide sufficient coverage of data to identify trends, leaving 77 out of 178 sites (43%) (Figure 6.7). AURN site data from 1987-2010 was also downloaded from the data.gov.uk website (<http://data.gov.uk/dataset/nitrogen-dioxide-annual-mean-comparison-with-health-objective-for-2005-1987-to-2010>). This dataset included UK and EU Site Types for each monitoring station, so the relevant fields from the two datasets were combined in a MS Access query. At the same time a query was run to calculate any differences between annual means recorded in the respective datasets. Some minor discrepancies (up to 3 µg/m<sup>3</sup>) were noted at three London sites relating to 2010 but these were not relevant to the study.



**Figure 6.7: Flow chart showing the selection process of Criterion 2: Compliance with monitoring data requirements**

A number of AURN sites had been identified by Ricardo-AEA as not meeting the siting criteria specified in Annex V of the Directive 2008/50/EC (Eaton, 2010) (Table 6.2). Of these sites all but Brighton Roadside were remaining in the filtered dataset; it was decided to retain these sites within the dataset at this stage in order not to restrict the potential number of AQMAs for which monitoring sites were available, however the questionable validity of data associated with these sites was noted.

**Table 6.2: AURN sites non-compliant with Directive 2008/50/EC siting criteria (from Eaton, 2010)**

Redacted due to copyright

### **6.3.3. Criterion 3: Compliance with monitoring siting requirements**

Details and grid references of the 217 operational and 79 discontinued government monitoring sites were obtained from Ricardo-AEA, who QA/QC the monitoring network on behalf of Defra, as data for these sites are reported to the European Commission against the limit values. The spatial dataset for the operational sites (UK\_air\_operational\_sites\_feb\_2012) included sites from other monitoring networks so these were filtered in Excel to select only those 130 sites belonging to the Automatic Urban and Rural Network (AURN) (UK-air\_operational\_sites\_feb\_2012\_AURN). There was insufficient information in the spreadsheet to filter the data further, i.e. by pollutant or country. The dataset for the discontinued sites (AURN\_closed\_sites) included only AURN sites so did not require filtering by network, however the dataset was able to be filtered in Excel to select only those sites that had monitored NO<sub>2</sub> (NO2\_AURN\_closed\_sites) and those that were in England (NO2\_England\_AURN\_closed\_sites) leaving 31 sites. Both filtered datasets were added to ArcView.

The 77 sites that met the data capture criterion (Criterion 2) were joined to both the operational and closed AURN spatial datasets, keeping only matching records, using the sites names as the common field, to create spatial AURN datasets complete with annual mean NO<sub>2</sub>. Twelve of the 130 operational sites<sup>16</sup> evidently did not monitor NO<sub>2</sub> between 1961 and 2012; this was confirmed by checking the sites on the Defra AURN

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<sup>16</sup>Auchencorth Moss, Ballymena, Barnsley 12, Bottesford, Great Dun Fell, Lerwick, London Harrow Stanmore, Lough Navar, Mace Head, Saltash Roadside, Weybourne, and York Bootham (non-England sites included here as not possible to filter the operational monitoring sites by country).



website and they were removed from the dataset. A further 43 operational sites had insufficient data for the period of interest<sup>17</sup>. This left 75 operational sites with sufficient data. Of the 31 closed sites, only two (Sandwell West Bromwich and Northampton [both Background Urban sites]) were identified with sufficient data for the period in question. An overlap between the closed and operational site datasets was identified with Northampton appearing in both. Northampton was therefore removed from the joined closed site dataset. One site (Glasgow City Chambers), which met the data capture criterion, did not appear in either the operational or closed site spatial datasets; regardless of precise location, given the distance between this Background Urban site and the most northerly England AQMA (Newcastle upon Tyne AQMA No.1) is more than 5 km, this was not considered to be an issue. The remaining one closed and 75 operational sites joined datasets were exported as new feature classes and merged to form one feature class with 76 combined closed and operational AURN sites with NO<sub>2</sub> annual mean concentrations from 1961 to 2012 (AURN\_ALLdatajoin\_merge).

From the merged dataset, sites were selected by EU site type (i.e. Traffic Urban, Background Urban and Background Rural). This was to enable the data from like sites to be compared, but also to ensure that the sites could be appropriately linked to the AQMAs, i.e. Traffic Urban sites identified within (or a short distance of) AQMAs to reflect the immediate characteristics of the exceedence area, but Background Urban sites representative of the wider urban area, and Background Rural sites to be associated with AQMAs over greater distances to capture the regional concentrations (Table 6.3). Industrial Urban sites also indicate the potential for significant sources other than road transport to affect local air quality, which may render AQMAs and associated AQAPs within the vicinity to be deemed unrepresentative and therefore non-applicable to other road transport-based AQMAs.

A selection by location revealed that there were no Airport AURN sites within the 2005 AQMAs but there were two Industrial Urban sites: Salford Eccles in the Salford AQMA (ID 134) and Sheffield Tinsley in the Sheffield M1 Corridor Air Action Zone AQMA (ID 52). A 'one-to-many' spatial join was carried out on each of the AURN site types with sufficient data and the 2005 AQMA dataset to identify 'Traffic Urban', 'Background Urban' and 'Background Rural' AURN sites within a certain distance of AQMAs. Distances of 0.5 km for Traffic Urban sites, 5 km for Background Urban sites and

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<sup>17</sup> This included Strath Vaich, although not matched on site name due to differences in spelling – StrathVaich vs Strathvaich.

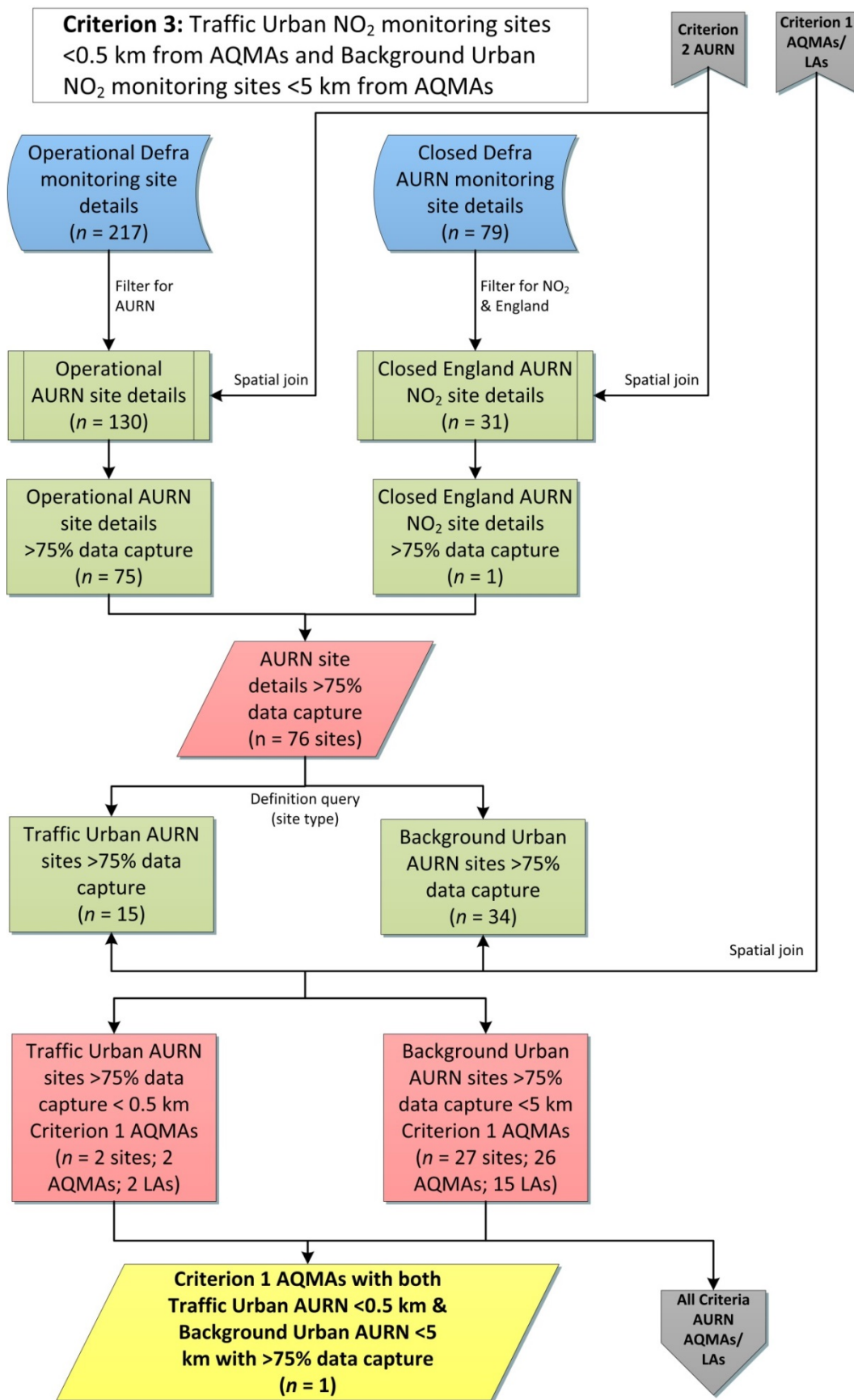


50 km for Background Rural sites (Figure 6.8) were used based on an interpretation of the macroscale siting criteria detailed in Annex V (B.1) of Directive 2008/50/EC and site type definitions on the Defra UK-Air website<sup>18</sup> (Table 6.3). These are also supported by the literature which suggests that background concentrations of NO<sub>2</sub> are generally reached within 500 m of the road (Baldauf *et al.*, 2009; Zhou and Levy, 2007), though this obviously varies with traffic volumes and meteorological effects. Local contribution nitrogen dioxide was taken as the difference between concentrations at Traffic Urban and Background Urban sites (as per Stedman *et al.* (2013) (see section 8.4.2.3, p. 183) as Background Rural sites were considered too remote to be representative of non-roadside concentrations of NO<sub>2</sub> relevant to AQMAs.

**Table 6.3: Comparison of Defra and EU site type definitions**

Defra site types	Defra definition	EU site types	2008/50/EC Directive definition	Interpreted distance criteria
Kerbside Roadside	Representative of street segment no less than 100 m length. At least 25 m from the edge of major junctions and no more than 10 m from the kerbside	Traffic	At least 25 metres from the edge of major junctions and no more than 10 metres from the kerbside	< 0.5 km
Urban centre Urban background	Representative for several square kilometres	Background urban	Places representative of exposure of the general urban population	< 5 km
Rural Remote	> 5 km	Background rural	No definition	< 50 km

<sup>18</sup> <http://uk-air.defra.gov.uk/networks/site-types>



**Figure 6.8: Flow chart showing the process for selection of Criterion 3: Compliance with monitor siting requirements**

### **6.3.4. AQMAs/Local authorities that comply with Criterion 1 Compliance with Action Plan Progress Reporting requirements**

Of the 158 2005 AQMAs, there were 105 (over 55 local authorities) that met Criterion 1 (i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in 2009 or later).

### **6.3.5. AQMAs/Local authorities that comply with Criteria 2 and 3: Compliance with monitoring data and siting requirements**

#### **6.3.5.1. Traffic Urban sites**

There were only four Traffic Urban AURN sites that met the data and siting criteria identified in Sections 6.3.2 and 6.3.3 relevant to the Round 1 baseline. These are representative of four AQMAs in four local authorities with Traffic Urban AURN sites within, or within 500 m of, their 2005 AQMA with sufficient data for the period 2005-2012 (Appendix 7. Table 12). Two of these sites (Bristol Old Market and Bury Roadside) were identified as not meeting the siting criteria stated in the EU legislation (Table 6.2).

#### **6.3.5.2. Background Urban sites**

There were 15 Background Urban AURN sites that met the data and siting criteria identified in Sections 6.3.2 and 6.3.3 relevant to the Round 1 baseline. This represents 38 AQMAs in 23 local authorities with AURN Background Urban sites within 5 km of their 2005 AQMA(s) with sufficient data for the period 2005-2012 (Appendix 7. Table 13). There are only two local authorities with both suitably sited Traffic Urban and Background Urban AURN sites (Bristol City Council and Bury), however, it should be noted that the Traffic Urban sites identified for these authorities did not meet the EU siting criteria (Table 6.2).

#### **6.3.5.3. Background Rural**

There were 9 Background Rural AURN sites that met the data and siting criteria identified in Sections 6.3.2 and 6.3.3 relevant to the Round 1 baseline. This represents 87 separate AQMAs in 46 local authorities with Background Rural AURN sites within 50 km of their 2005 AQMA(s) with sufficient data for the period 2005-2012 (Appendix 7. Table 14).

#### **6.3.5.4. Summary of AQMAs/Local authorities that comply with Criteria 2 and 3**

Of the 158 2005 AQMAs, there is only one (Bury AQMA) that met both criteria 2 and 3 for all three Traffic Urban, Background Urban and Background Rural sites. There are only two AQMAs (Bristol AQMA and Bury AQMA) that met both criteria 2 and 3 for

Traffic Urban and Background Urban AURN monitors to enable them to calculate the local element of NO<sub>2</sub>. Two AQMAs have Traffic sites only (Bath AQMA, Oxford AQMA) that met both criteria 2 and 3, and 36 AQMAs in 21 local authorities have Background Urban sites only that met both criteria. Of the 158 2005 AQMAs, there are 118 AQMAs (75%) which did not meet criteria 2 and 3, i.e. 75% of these AQMAs have no suitably located AURN sites with sufficient data for the period 2005-2012 to enable trends on local nitrogen dioxide concentrations to be calculated (Appendix 7. Table 15).

### 6.3.6. AQMAs/Local authorities that comply with all three selection criteria

Of the 158 2005 AQMAs, there were sufficient AQAP PRs (i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in 2009 or later) for 105 of them (covering 55 local authorities). Of these 105 there was only one (Bristol AQMA) that had sufficient monitoring data and suitably located Traffic Urban and Background Urban sites (though the Traffic Urban site has been deemed to be non-compliant with EU siting criteria). There were two AQMAs (Bristol AQMA, Oxford AQMA) that had sufficient monitoring data for Traffic Urban sites (one (Oxford AQMA) with Traffic Urban sites only) and 26 AQMAs in 15 local authorities with sufficient monitoring for Background Urban sites (25 AQMAs in 14 local authorities with Background Urban sites only) (Appendix 7. Table 16).

Having passed through each of the above filters (i.e. AQAP PRs criterion, monitoring data criterion and siting criterion), there is only one AQMA that meets all three criteria with both a Traffic Urban site and Background Urban site to allow calculation of the local road contribution to NO<sub>2</sub> (Figure 6.9); one meeting the criteria for a Traffic Urban site only; and 25 AQMAs across 14 local authorities that met the criteria for Background Urban sites only. Using the AURN sites, therefore, there is insufficient data available to calculate the local contribution to NO<sub>2</sub> and therefore the effectiveness of the AQAP implementations to reduce local NO<sub>2</sub>.

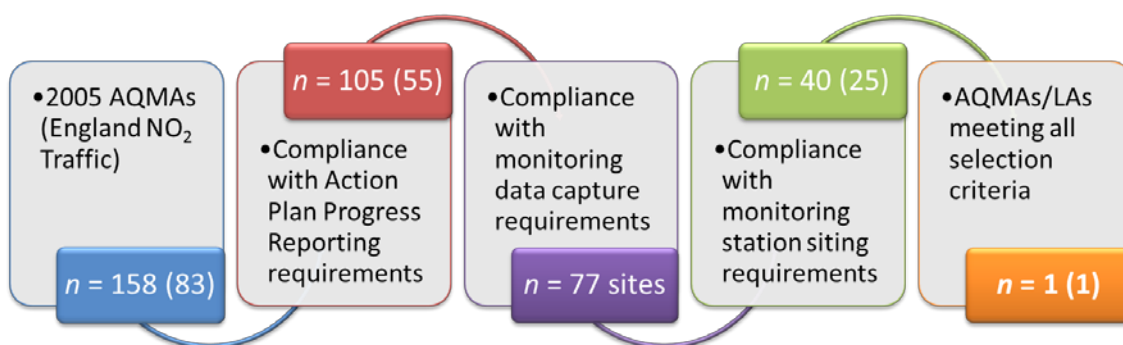


Figure 6.9: Summary flow diagram for AURN sites

As previously discussed in Section 3.2, local authorities also operate automatic monitors, which are required to adhere to strict QA/QC procedures. Having identified that government monitoring sites/data (as reported to the European Commission) alone are inadequate to assess the effectiveness of local air quality action plans, local authority automatic monitoring data were examined to determine whether these sites could be used in addition to the AURN sites. Local authority Traffic sites were identified for those AQMAs that had suitable AURN Background Urban sites. To ensure the most comparable data are used, these were automatic monitors that have been correctly QA/QC'd according to Defra Technical Guidance. As far as possible, sites were selected on the basis of their consistency with micro- and macro-scale siting criteria as defined in Annex V of Directive 2008/50/EC (Table 6.3). Information about the availability and location of local authority Traffic Urban (Roadside or Kerbside) monitoring sites, the sufficiency of monitoring data and the adequacy of the QA/QC procedures was obtained from the LAQM reports (USAs and Progress Reports).

Given that there are only 26 AQMAs across 15 local authorities with suitable Background Urban AURN sites, there was still likely to be insufficient data on which to draw meaningful conclusions following analysis of the monitoring data and AQAP measures implemented, so it was therefore necessary to obtain further local authority automatic monitoring data from the LAQM reports for both Traffic and Background Urban sites for those authorities for which sufficient AQAP PRs have been identified. The process described below is depicted in Figure 6.10.

### **6.3.7. LA Automatic Monitors that comply with Criterion 3: Compliance with monitor siting requirements**

Local authority Progress Reports (from 2010–2013) and USAs (from 2009 and 2012) were checked for details of local authority monitoring sites to complement the AURN Background Urban sites already identified. 185 sites were selected for further investigation (Appendix 7. Table 14).

Using the grid references supplied in the Review and Assessment reports, the selected 185 local authority monitoring sites were mapped in ArcGIS. Sites were selected on the basis of their site type, i.e. Roadside, Kerbside, Motorway, Façade, Intermediate, City Centre or Town Centre to represent 132 Traffic Urban sites, and Urban Centre, Urban background or Suburban to represent 53 Background Urban sites. A select by location with respective buffer distances, was used to identify those Round 1 baseline AQMAs within 0.5 km of Traffic Urban sites and 5 km of Background Urban sites. Summarising the resulting feature classes' attribute tables based on LA ID identified the number of

local authorities to which the AQMAs relate. Of the 132 Traffic Urban sites, 83 were identified as being representative of 59 AQMAs in 40 local authorities; and of the 53 Background Urban sites, 50 were identified as being spatially representative of 59 AQMAs in 40 local authorities; 32 AQMAs in 23 local authorities were common to both, i.e. had representative Traffic Urban and Background Urban local authority monitoring sites. The AQMAs and spatially joined local authority monitoring sites are shown in Appendix 7. Table 18.

Comparing these local authorities and AQMAs with those identified from the AURN analysis gives the following:

- 1 AQMA with AURN Traffic Urban and AURN Background Urban sites
- 1 AQMA with AURN Traffic Urban and LA Background Urban sites
- 17 AQMAs with LA Traffic Urban and AURN Background Urban sites
- 32 AQMAs with LA Traffic Urban and LA Background Urban sites

There is some overlap within these, for example, the 32 AQMAs with both Traffic Urban and Background Urban local authority monitors include the one AQMA with both Traffic Urban and Background Urban AURN sites and 16 of the 17 AQMAs with local authority Traffic Urban and AURN Background Urban sites. Therefore in total, there are 34 AQMAs over 25 local authorities with both Traffic Urban and Background Urban monitors that meet the siting criteria (Traffic Urban sites <500m of an AQMA and Background Urban sites <5 km of an AQMA), taking into consideration both AURN and local authority monitors (Appendix 7. Table 19).

The next stage was to identify those AQMAs with local authority monitors that meet the data criteria, i.e. 75% data capture between 2005 and 2012.

### **6.3.8. LA Automatic Monitors that comply with Criterion 2: Compliance with monitoring data capture requirements**

The same data capture requirements as was used for the AURN data was used for the local authority monitoring data, i.e. 75% data capture annually and 75% data capture for the period 2005-2012 to give at least six years monitoring data. The USAs and Progress Reports for the 34 AQMAs over 25 local authorities identified above were again consulted and annual means and data capture statistics reported therein were extracted into separate spreadsheets. Data for 100 monitoring sites were captured between 2004 and 2012 (60 Traffic and 40 Background sites). Utilising only those annual means for which annual data capture was 75% or greater, the data capture over the period 2005-2012 was calculated for each site. This revealed 22 Traffic sites



representative of seven AQMAs and 10 Background sites also representative of seven AQMAs; of these seven apiece, three AQMAs were shared, i.e. had both Traffic and Background local authority sites that met both siting and data capture criteria.

### **6.3.9. AURN and LA monitors meeting siting and data capture criteria**

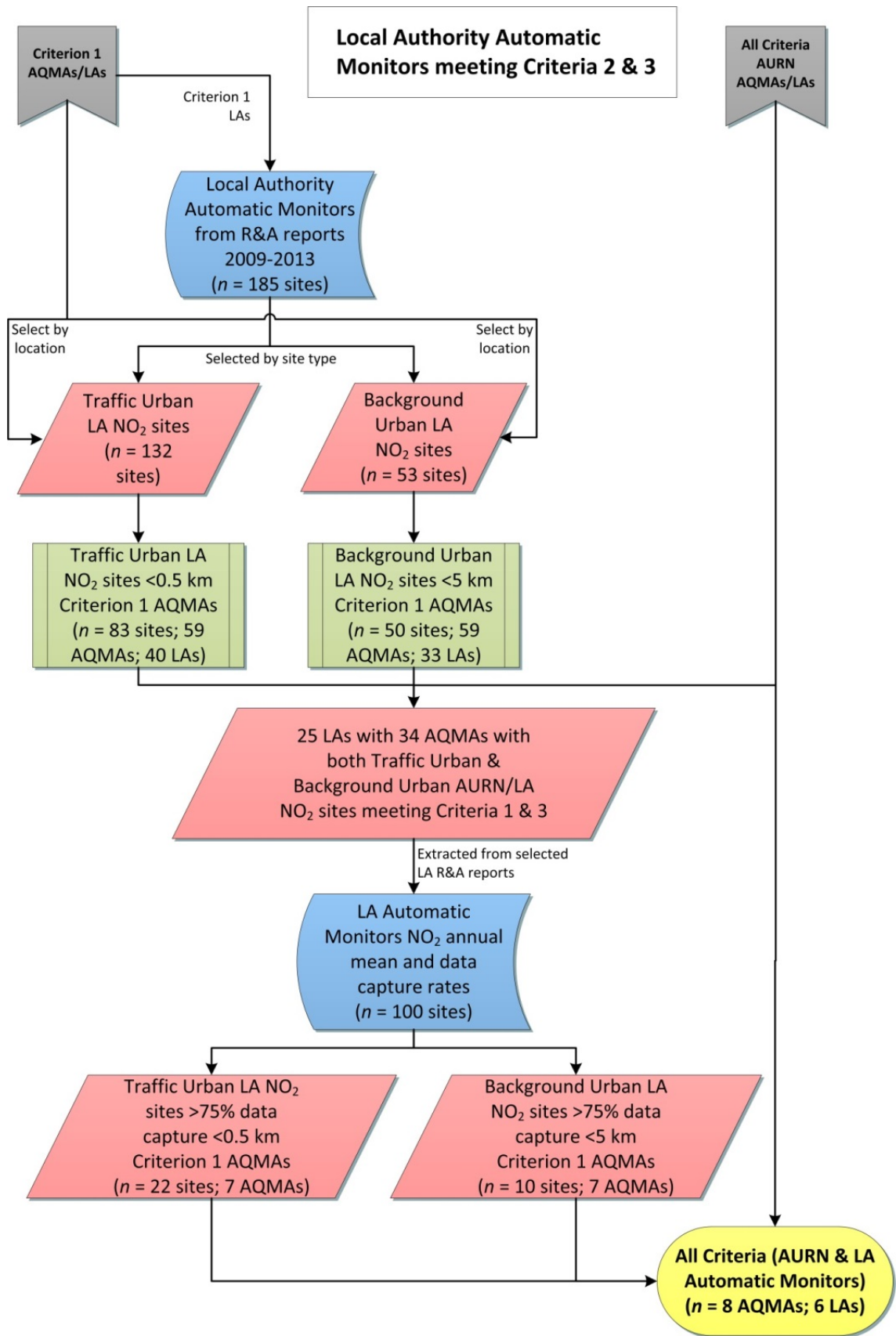
The next stage was to identify whether there were AQMAs identified as meeting the Criterion 1 AQAP Progress Reporting requirements, for which there were LA monitors that met both Criteria 2 and 3 (data capture and siting requirements). Taking AURN sites as preferential where both AURN and LA monitors existed for an AQMA, on the basis that AURN sites are more robustly and rigorously QA/QC'd and largely applicable to the EU siting criteria, eight AQMAs over six local authorities were identified as having both Traffic and Background sites meeting both siting and data capture requirements using a combination of AURN and LA monitors. The AQMAs, local authorities and the representative monitoring sites are presented in Appendix 7. Table 20.

In combining the data for the AURN and local authority sites, it was observed that some local authority reports also included details and data relating to AURN sites in their areas, even where these were not run by the local authorities. In some cases these were reported under different site names, though investigation of grid reference or location details identified these as being the same sites. There were also a number of discrepancies identified in the reported annual means for these sites, for example, the annual means reported by Bristol City Council for Old Market and St Pauls differed from those reported by Defra to the EC; similarly, there were discrepancies in the Leicester Centre data (reported as AURN (New Walk Centre) in the local authority reports), and also discrepancies in Oxford Centre Roadside data (reported as St Aldate's AUN in the local authority reports). It is not clear why these discrepancies have arisen, however, it may be due in part to the Review and Assessment reporting timescales causing local authorities to report unratified AURN data, while the data reported by Defra to the European Commission would have been fully ratified. With these observations in mind, it is with extreme caution that the local authority data are interpreted.

Three of the AURN sites identified in Appendix 7. Table 20 do not meet the EU siting criteria (Old Market, Leicester Centre and Sandwell West Bromwich) (Eaton, 2010). Furthermore, the siting criteria and therefore the data for some sites appear to have been misclassified in local authority reports. Bristol City Council, for example, reported Rupert Street as being an Urban Centre site, which equates to Background Urban,

however this site is more correctly a Traffic Urban site, being located on a central reservation with relevant exposure only for the 1-hour mean objective and with the highest recorded automatic analyser concentrations in Bristol. Oxford City Council has also reported the St Aldate's AUN site as Urban Centre, while Defra have identified this site (as Oxford Centre Roadside) as a Traffic Urban site. It would appear that local authority monitor siting classifications are not rigorously applied and it is therefore recognised that there may have been local authority sites that were omitted from this study due to being incorrectly classified as Traffic or Background sites. Without examining the siting criteria and site classifications for all of the 185 local authority monitoring sites identified, on which detail is generally sparse in many local authority reports, it is not possible to precisely determine the effect of relying on local authorities' self-site classification. Therefore the sample identified was used and each AQMA/local authority in this sample was treated as a case study, closely inspecting the implementation of AQAP measures, the monitoring sites and data and the evolution of changes to the AQMAs to investigate how LAQM and, in particular, Action Planning has contributed to achieving the EU NO<sub>2</sub> annual mean limit value in each case.





**Figure 6.10: Flow diagram showing the selection process for the case study AQMAs based on local authority and AURN monitors**

#### **6.4. Comparing monitoring data**

Having defined a sample of local authorities which meet the monitoring and Action Planning criteria identified in Section 0, it was possible to address the first objective:

*Objective 1: Document the change in the concentration of annual mean nitrogen dioxide from road traffic using continuous monitoring data, in AQMAs declared in Round 1 of Review and Assessment.*

Monitoring site selection and data collection is reported in Section 0 and the AURN and local authority monitoring sites for each AQMA are presented in Appendix 7. Table 20. There were 25 Traffic Urban sites (2 AURN and 23 LA) and 7 Background Urban sites (4 AURN and 3 LA) that were representative of the eight AQMAs across six local authorities<sup>19</sup>. Annual mean NO<sub>2</sub> concentrations for years with greater than 75% data capture, as reported in the local authorities' Review and Assessment reports, were recorded from 2004 to 2012. For each AQMA annual mean NO<sub>2</sub> concentrations for the representative Traffic Urban and Background Urban sites were matched against each other year-on-year to enable the local contribution NO<sub>2</sub> to be calculated on an annual basis. As all sites had been selected based on 75% data capture across the period 2005-2012, there were at least six years' valid data for each site, however, Traffic Urban and Background Urban sites did not necessarily have corresponding years with valid data. The 75% data capture across the period ensured there was a maximum of two years without data for each site, and therefore at least four years' matching data between Traffic Urban and Background Urban sites on which to calculate local trends. The inclusion of 2004 data, where available, also contributed to the robustness of the trend calculation. Local contribution NO<sub>2</sub> was calculated as the difference between Traffic Urban and Background Urban sites' annual means, as per Stedman *et al.* (2013) (see section 8.4.2.3, p. 183). Traffic Urban, Background Urban and Local Contribution NO<sub>2</sub> annual means were plotted in SPSS, together with linear regression lines and 95% confidence intervals. These graphs are presented in Section 7.5.

#### **6.5. Comparing Action Plans**

The sample of local authorities were selected, in part, because they complied with the Action Plan Progress Reporting requirements (Criterion 1) (i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in

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<sup>19</sup> Both Rupert Street (Bristol) and High Street (Oxford) had been classed by the respective local authorities as Background sites (Urban Centre) but were more representative of Traffic Urban EU siting characteristics and hence treated as such for the purposes of this research.

2009 or later). The purpose of this criterion was to enable an examination of the measures included in the AQAPs and the progress made in implementing them in order to begin to address the second objective:

*Objective 2: Evaluate whether the measures included in the Air Quality Action Plans produced following Round 1 are being achieved and whether implementation is contributing to an improvement in nitrogen dioxide concentrations.*

#### **6.5.1. Implementation of AQAP measures**

To address the first part of this objective, whether measures included in the AQAPs are being achieved, the AQAPs of the case study local authorities were reviewed and details about the measures were entered into an Excel spreadsheet. Details included the local authorities' devised themes that the measures reportedly came under, as well as the proposed measure itself. A separate sheet was used for each local authority with the measures listed in a column and progress on each of these measures, taken from subsequent AQAPs and AQAP PRs, listed in separate adjacent columns to give a temporal picture of progress on measures in each row. Where additional measures were added in later AQAP revisions, these were either inserted into the relevant theme or added to the end of the list. Where information was available, the implementation date for those measures that were either fully or partially complete was also recorded. In the final column an assessment was made, using the latest reported progress report, on whether the measure was 'Completed', 'Ongoing' or 'Not implemented'. For some measures progress ceased to be reported and these were recorded as 'No longer reported'. Columns in the spreadsheet were filtered to identify and group measures from each of these 'overall progress' states in order to compare between local authorities and to examine in relation to the changes in local contribution NO<sub>2</sub> identified in Section 6.4. AQAP Progress Tables for each case study local authority are presented in Appendix 1Appendix 9:.

#### **6.5.2. Evaluation of AQAP measures**

It is postulated that well-formulated and considered measures are more likely to be successfully implemented. To test this hypothesis, in a separate spreadsheet, further details on each of the measures were recorded against SMART criteria (Doran, 1981) (Appendix 1Appendix 12:).

Using the principles of the SMART objectives approach, the measures set in local AQAPs were assessed for their likely effectiveness based on the following criteria:

- **Specific:** does the AQAP measure target the source of the exceedence?

The specificity of AQAP measures will relate to how targeted the measure is at tackling the identified source, as defined in the Stage 4/Further Assessment reports. Effective measures should also be targeted at the area of exceedence, as clarified in the Stage 4/Further Assessment, and characterised by the AQMA, and the pollutant and objective on which the AQMA is declared, in this case NO<sub>2</sub> annual mean objective. To some extent this criterion is subjective, not being explicitly stated in local authorities' AQAPs.

- **Measureable:** does the AQAP measure include an indicator of progress?

This represents an indicator that the local authority has stated against which progress with the AQAP measure will nominally be assessed. These may be direct reductions in NO<sub>2</sub> concentrations or NO<sub>x</sub> emissions, or proxy measures, e.g. number of travel plans implemented.

- **Assignable:** does the AQAP measure have a clearly identified responsible assignee?

Successful implementation of an AQAP Action requires the identification of a clear lead organisation and for that organisation to accept responsibility for that Action. By first of all determining whether the AQAP explicitly designates responsibility, the strength of the AQAP measures can be judged (i.e. no clear lead would signify a weak Action that is unlikely to be implemented); and secondly, comparing the ability of particular lead organisations to complete Actions, may reveal insights into who should (not) take responsibility for AQAP measures.

- **Realistic:** does the AQAP measure state what the expected improvement in air quality is likely to be, against the likely cost (cost-effectiveness)?

This criterion is taken from explicit statements of cost-effectiveness or inferred from separate statements of estimated cost and air quality impact. For some local authorities this is presented as actual cost (either annual or over the period of the AQAP), while others use ordinal ranked classifications (e.g. Low/Medium/High cost), which may, or may not, have cost bandings attributed to them. Establishing accurate costs is difficult and so these figures are often broad estimates, and may include capital and/or revenue costs. Implementation of measures is often purportedly dependent on funding and, while some local authorities will have access to relatively greater resources than others, it is interesting to see whether there are patterns to be found between case studies regarding the relative costs of Actions and their implementation. While there

may be other benefits to be gained from implementation of AQAP measures (e.g. road safety, quality of life), the ultimate aim of the AQAP is to improve air quality. To counter against the cost in the cost-effectiveness calculation, there must therefore be some attempt made to quantify the effect of measures on air quality. In some cases, where measures have direct and measurable impacts on numbers of vehicles, anticipated air quality improvements can be calculated from modelled emission reductions. In others, where the impact of measures is less direct, air quality impacts can be more difficult to quantify. In these cases, proxy measures with broad, ordinal rankings may be used to estimate the relative impact on air quality (e.g. Low/Medium/High impact), potentially accompanied by definitions. Although ostensibly the primary aim of an AQAP, it is interesting to see whether there is any relationship between the estimated relative effects on air quality of AQAP measures and their implementation, across the case study local authorities.

- **Time-related:** does the AQAP state when the measure is likely to be implemented?

Another factor that may influence the prioritisation and implementation of AQAP measures is the timescale over which the measure is applicable. Measures may be short-, medium- or long-term, with different definitions applied in different local authorities. Local authorities are advised to consider including measures across a range of timescales (NSCA, 2001; NSCA, 2000), however, those with less severe exceedences may be tempted to focus on short-term Actions as more cost-effective. It is interesting, therefore to gauge whether the relative timescales of measures affects their implementation in the case study local authorities. While connected to timescale, the expected year of completion can also be used to measure implementation of Actions. Comparison with the actual year of completion (where available) can help to determine whether the local authority are on track, while revised completion dates in subsequent AQAP editions may indicate a slipping schedule. Identification of measures that have (not) been achieved in the anticipated timeframe, in the context of the other factors detailed above, would make an interesting comparison between the case studies.

Each of the case study local authorities' AQAPs were reviewed to determine how SMART the measures were as defined in Section 4.4.1.1. Each of the criteria was scored with equal weighting to give an overall score out of five. These SMART scores were compared across the local authorities to identify any similarities and differences. SMART scores were also compared against the overall progress of each measure to

determine whether the hypothesis that SMART measures are more likely to be implemented is supported by the assessment made on the case study local authorities.

### **6.6. Summary**

This chapter has presented the methodology used in this research. The key aspects to this are the identification of the Round 1 baseline local authorities and AQMAs using the Review and Assessment and AQMA databases and the GIS dataset; the selection criteria identifying those local authorities and AQMAs with adequate data to implement the methodology; and the comparison of monitoring data and AQAPs for the resulting case study local authorities. The following chapter presents a critical analysis of the results of this methodology.

## **CHAPTER 7. RESULTS**

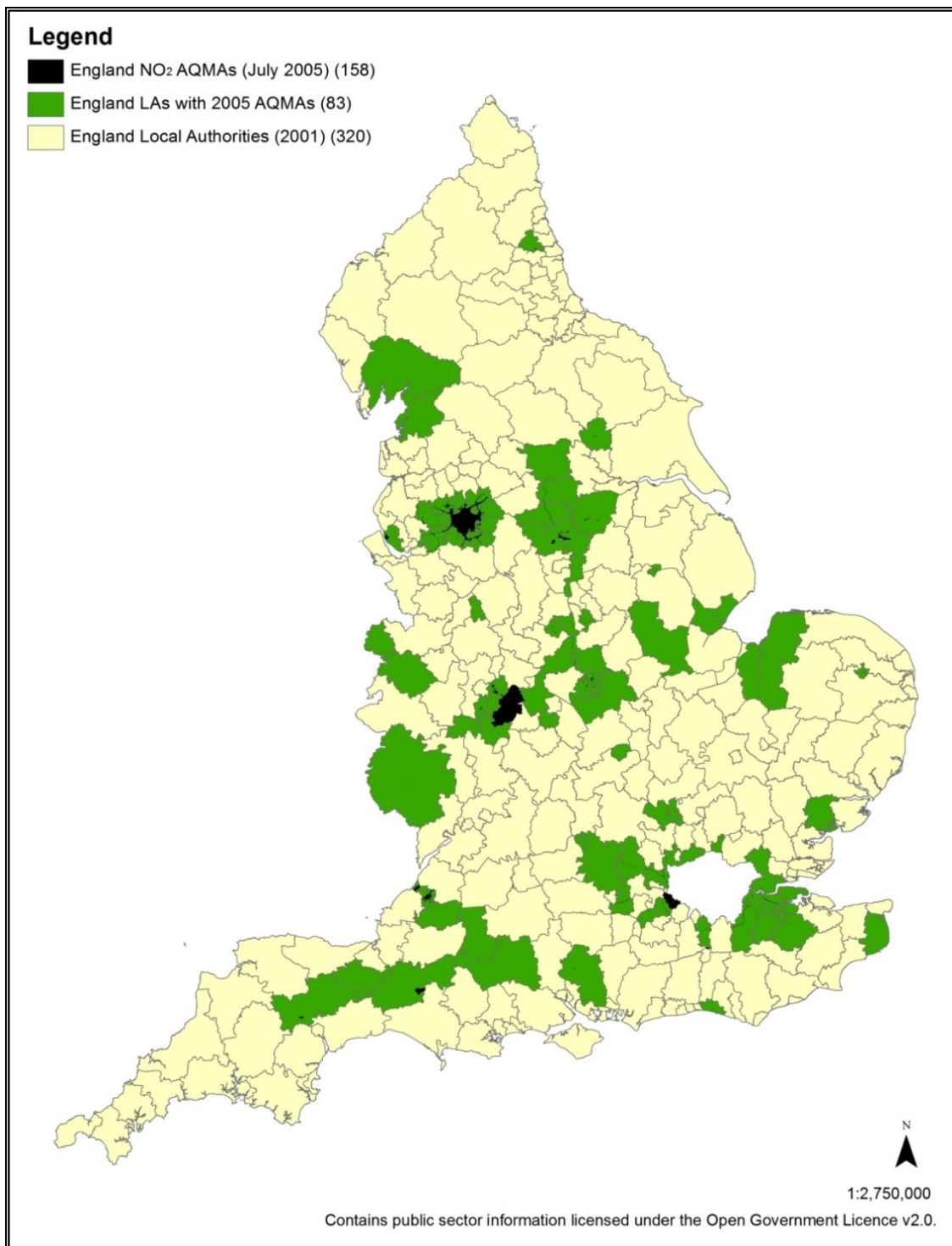
### **7.1. Chapter overview**

This chapter presents the results as a series of maps, charts, graphs, tables and photographs within the chapter itself and also in the Appendices. These figures and tables are used to depict the findings of each stage of the methodology. The first part of this is a critical analysis of the Round 1 baseline AQMAs from the GIS dataset and the spatial relationship between these and the UK Zones and Agglomerations. The following section presents the selection of those Round 1 baseline AQMAs and local authorities with adequate data to implement the methodology. A detailed assessment of the resulting case study local authorities and AQMAs follows, looking specifically at the relevant monitoring sites and data and the implementation and critical evaluation of their AQAP measures.

### **7.2. Identifying the Round 1 baseline**

The local authorities and AQMAs that were used as the Round 1 baseline, i.e. those that had declared AQMAs for nitrogen dioxide from traffic sources following Round 1 in England only, were selected from the July 2005 GIS dataset of AQMAs provided by Defra. The selection resulted in 158 AQMAs across 83 local authorities in England (Figure 7.1), representing 26% of all local authorities in England at that time.

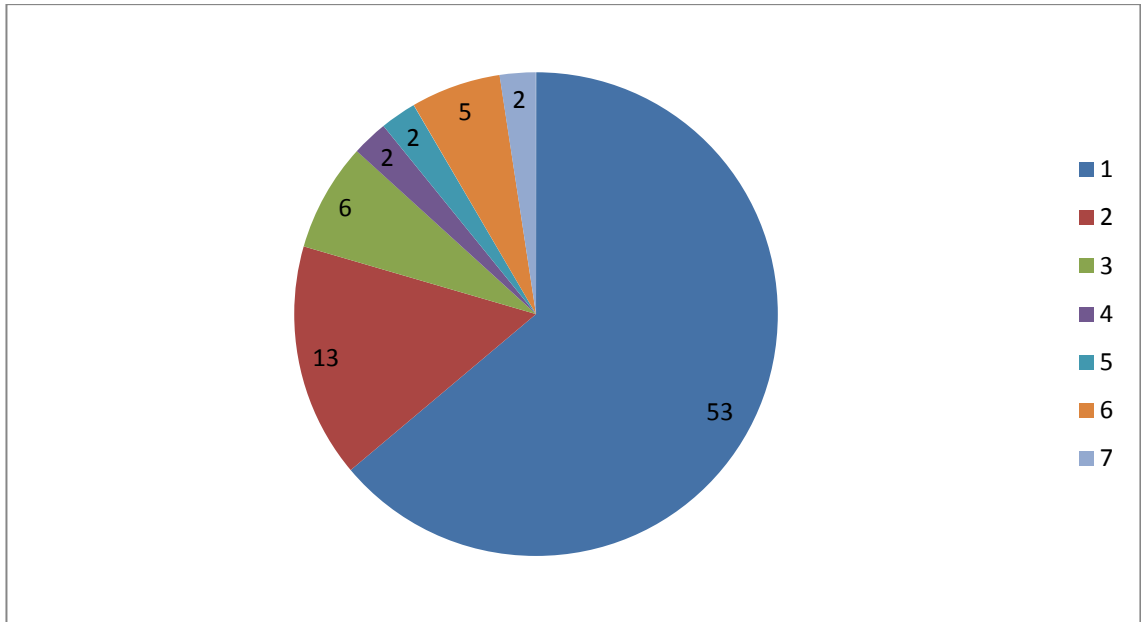




**Figure 7.1: Local authorities in England that had declared AQMAs for annual mean NO<sub>2</sub> objective from road traffic sources from Round 1 (Round 1 baseline LAs) [N.B. due to the scale of the map, smaller AQMAs may not be visible]**

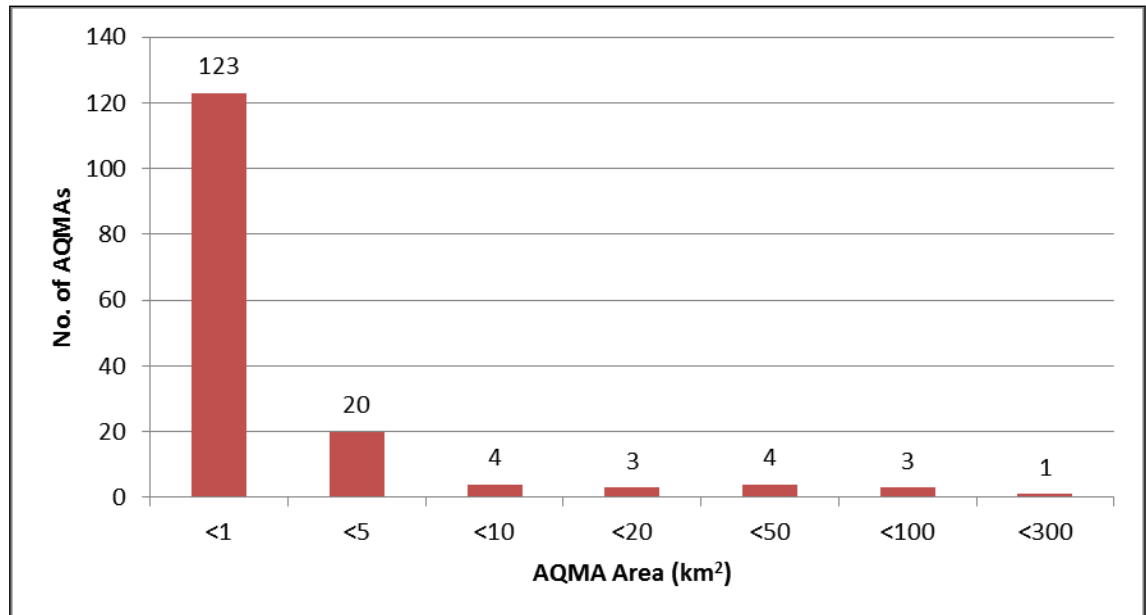
There is a wide geographical spread of local authorities having declared AQMAs for NO<sub>2</sub> annual mean from road traffic sources, from north to south, east to west, coastal and inland, and urban and rural. Most local authorities in this dataset had only one AQMA ( $n = 53$ ), but 36% had two or more AQMAs (Figure 7.2).





**Figure 7.2: Number of AQMAs per local authority**

There were only two local authorities (Birmingham CC and Spelthorne BC) that had declared the whole of their administrative area as an AQMA. Birmingham AQMA also represents the largest AQMA in this dataset (~268 km<sup>2</sup>), with Oswestry AQMA the smallest (0.000347 km<sup>2</sup>). The majority of the AQMAs in this dataset are smaller than 1 km<sup>2</sup> ( $n = 123$ ) (Figure 7.3).

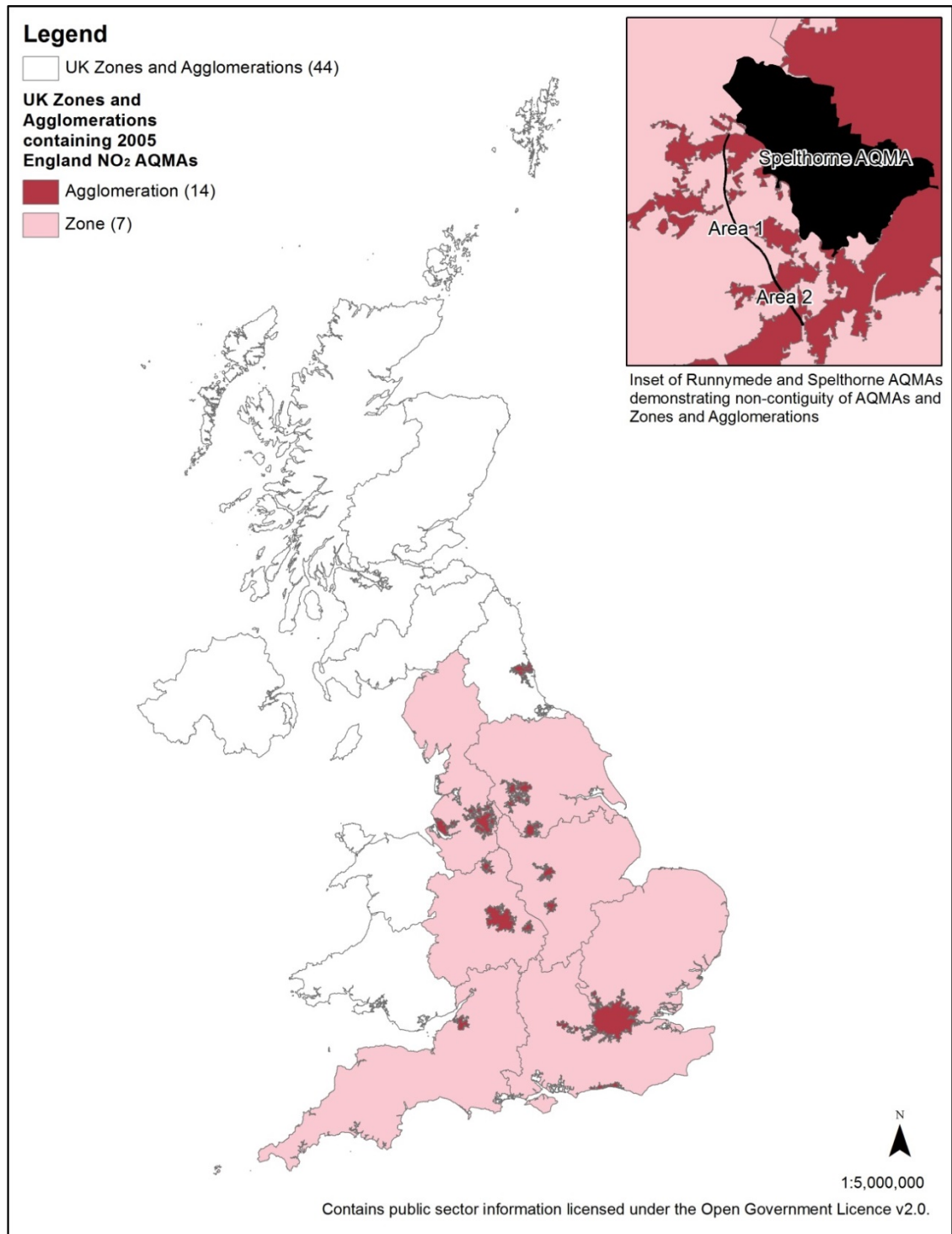


**Figure 7.3: Histogram of AQMA areas (km<sup>2</sup>)**

Most AQMAs in this dataset are discrete and distinct from neighbouring authorities' AQMAs, even where they abut administrative boundaries; the exception being the ten Greater Manchester local authorities (Manchester, Trafford, Salford, Wigan, Bolton, Bury, Rochdale, Oldham, Tameside and Stockport) that coordinated the declaration of their respective AQMAs around modelled exceedences across the urban area and radial trunk roads. From the AQMA descriptions it is possible to discern that 37% AQMAs in this dataset are related to motorways or trunk roads.

### **7.2.1. Spatial comparison of AQMA dataset and Zones and Agglomerations**

Given that this research is concerned with whether Local Air Quality Action Planning is effective in helping to achieve the EU limit value for annual mean NO<sub>2</sub>, it was necessary to identify how the Round 1 baseline AQMAs related to the Zones and Agglomerations that are Defra's basis for reporting exceedences to the European Commission. Figure 7.4 shows those Zones and Agglomerations that contain Round 1 baseline AQMAs, together with the AQMAs. All of the AQMAs were contained within one or more of the Zones and Agglomerations that were in breach of the annual mean NO<sub>2</sub> limit value. Therefore, the AQMAs selected as the baseline for this study are representative of areas in which EU limit values are exceeded. This spatial comparison also revealed that the boundaries of the Zones and Agglomerations and local authorities' administrative areas and their AQMAs are not contiguous, with some AQMAs included in more than one Zone or Agglomeration (see inset).



**Figure 7.4: UK Zones and Agglomerations containing Round 1 baseline AQMAs**

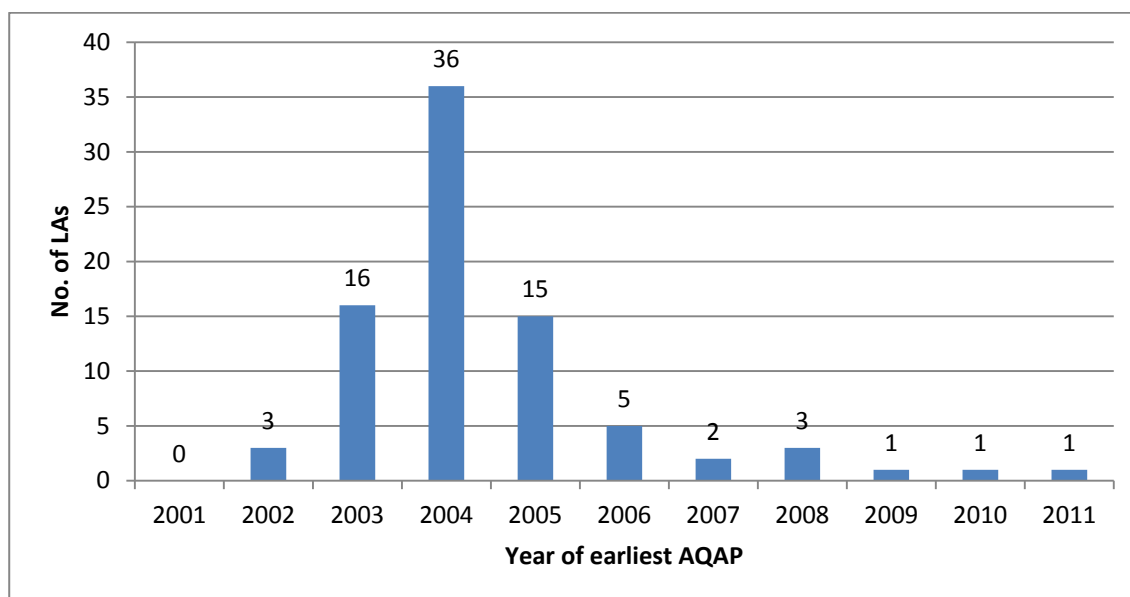
### 7.3. Compliance with AQMAs/local authorities selection criteria

The methodological approach, as set out in Figure 6.1, was to identify changes in local road-contribution NO<sub>2</sub> over the period of the implementation of AQAPs, the implementation of measures in related AQAPs, and to assess the correlative relationship between them. A series of three criteria were established (Figure 6.5,

Chapter 6) to identify those local authorities and respective AQMAs with valid monitoring sites and NO<sub>2</sub> annual mean data relevant to their AQMAs, and that had also published AQAPs and subsequent AQAP Progress Reports to enable the implementation of measures to be critically assessed.

### 7.3.1. Criterion 1: Compliance with Action Plan Progress Reporting requirements

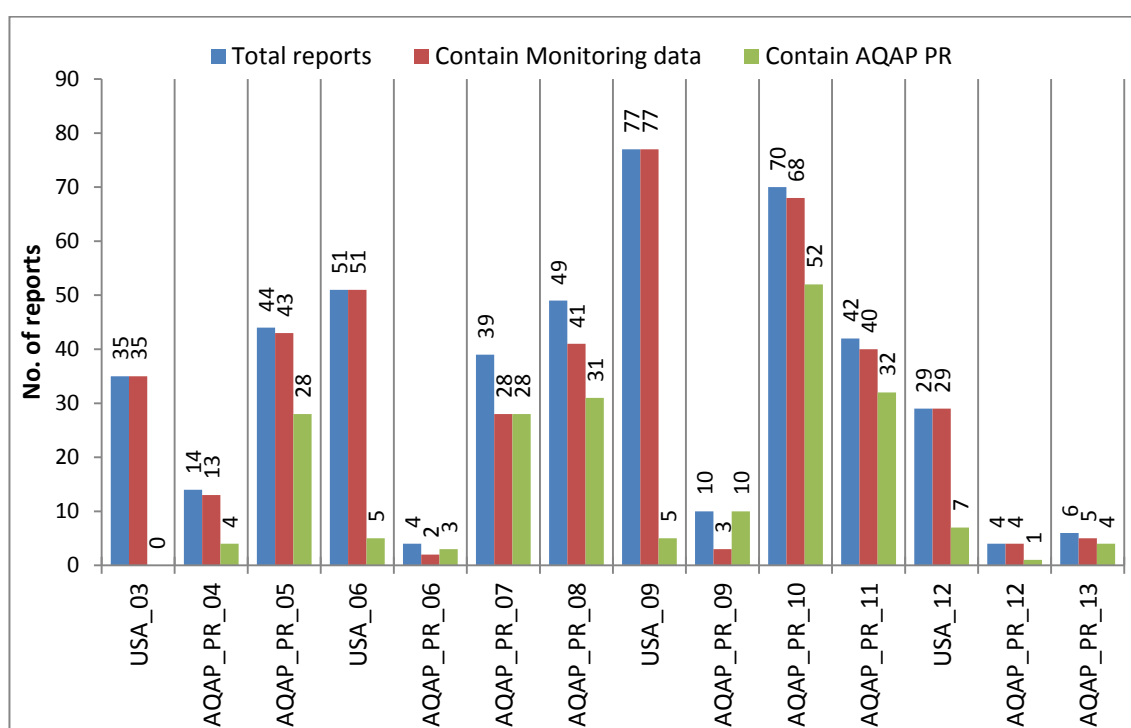
In determining the criteria for compliance with the AQAP Progress Reporting requirements, details of the reports that local authorities had submitted and which had been acquired for this research were examined. Details of the year of the earliest published AQAP were examined across the 83 local authorities in the Round 1 baseline (Figure 7.5). The modal year was 2004 with 36 (43%) of the AQAPs first published in this year. Given the Round 1 baseline dataset was dated July 2005 and the low number of AQAPs published after this date, it was considered that the cut-off for AQAPs should be 31/12/2005. This would capture an acceptable number of AQAPs and allow time for their implementation to be assessed.



**Figure 7.5: Year of earliest published Air Quality Action Plan from Round 1 baseline local authorities**

Details about AQAP progress were obtained from local authorities' AQAP PRs/Progress Reports and USA reports. Figure 7.6 shows the numbers of reports obtained for the Round 1 baseline local authorities and highlights whether these reports contained monitoring data, AQAP progress (or both). The reports are presented sequentially by year with USAs and AQAP PRs/Progress Reports published in the

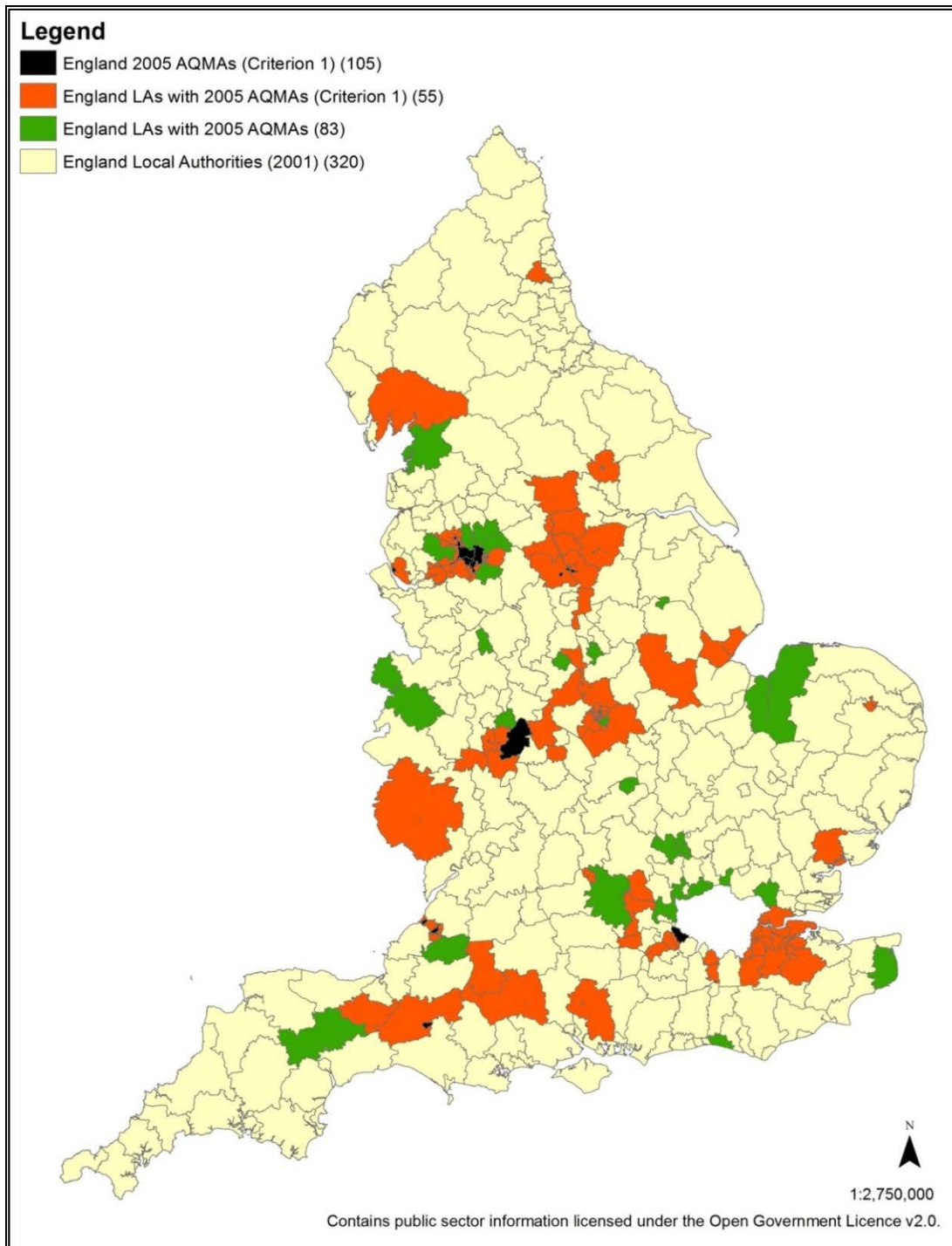
same year shown separately alongside each other. The three-yearly USA reports each mark the beginning of a Round of Review and Assessment; Figure 7.6 represents Rounds 2–5, though at the time of writing Round 5 was not complete and few reports were therefore yet available. In a USA year, local authorities were not required to publish Review and Assessment Progress Reports, although those with AQAPs were still expected to produce AQAP PRs. Some local authorities have included their AQAP PRs within their USAs, however, there are still many fewer AQAP PRs available in a USA year. Although there were a relatively high number of AQAP PRs available for 2007 and 2008, given the maximum cut-off date for the AQAPs was 31/12/2005, there would be insufficient time to implement many AQAP measures over this short period. A minimum cut-off for AQAP PRs of 2009 was therefore considered appropriate.



**Figure 7.6: Numbers of Updating and Screening Assessments (USAs) and Air Quality Action Plan Progress Reports (AQAP PRs)/Progress Reports and their contents**

Of the 158 2005 AQMAs, 105 of them (covering 55 local authorities) met the criterion for AQAP PRs (i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in 2009 or later) (Figure 7.7). This represents 66% of the Round 1 baseline local authorities and AQMAs, but, as can be seen from Figure 7.7, the distribution is still geographically broad. Of the 83 local authorities in the Round 1 baseline, 70 (84%) of them had met the first part of Criterion 1, i.e. published AQAPs before 1/1/2006, while 64 (77%) of them complied with the second part of

Criterion 1, i.e. AQAP PRs published after 2008. Independently these statistics indicate a large sample size and appear to justify the cut-off dates applied, however, 15 of the local authorities had AQAPs that met the criteria but insufficient AQAP PRs, and 9 of the local authorities that had AQAP PRs after 2008, had not published their AQAP prior to 1/1/2006; four local authorities (Brentwood BC, Lancaster CC, Luton BC and Walsall MBC) did not meet either part of Criterion 1.



**Figure 7.7: England local authorities meeting Criterion 1: Compliance with AQAP Progress Reporting requirements**

### 7.3.2. Criterion 2: Compliance with monitoring data requirements (AURN)

Figure 7.8 represents the 76 AURN NO<sub>2</sub> monitoring sites that met the Criterion 2 monitoring data requirements, i.e. >75% annual data capture and >75% data capture 2005-2012. This represents just 43% of the 178 AURN sites (both closed and operational) that monitor annual mean NO<sub>2</sub>. The sites are presented by EU site type and show 16 Traffic Urban and 35 Background Urban sites; the remaining site types were not considered relevant to the local contribution NO<sub>2</sub> calculation.

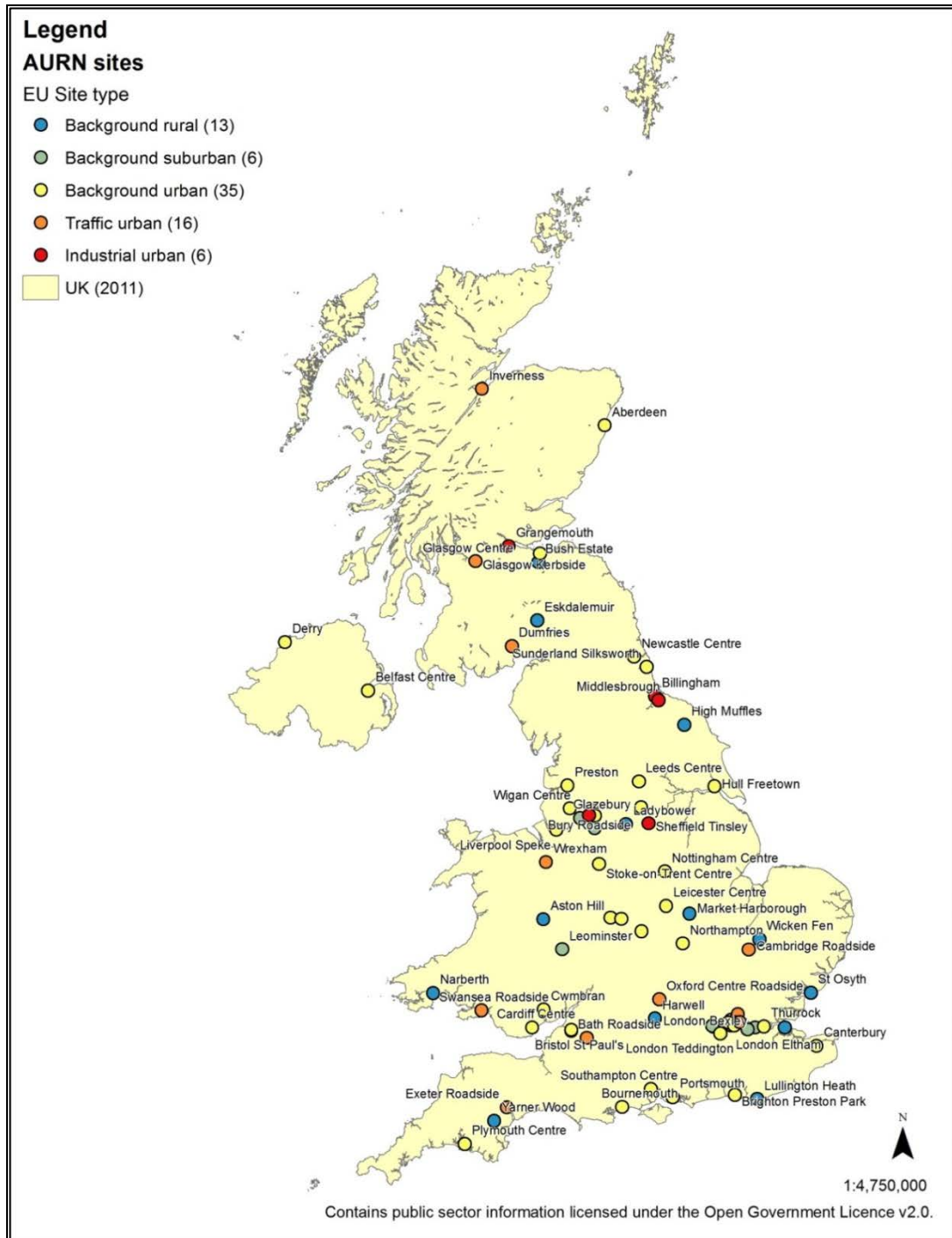
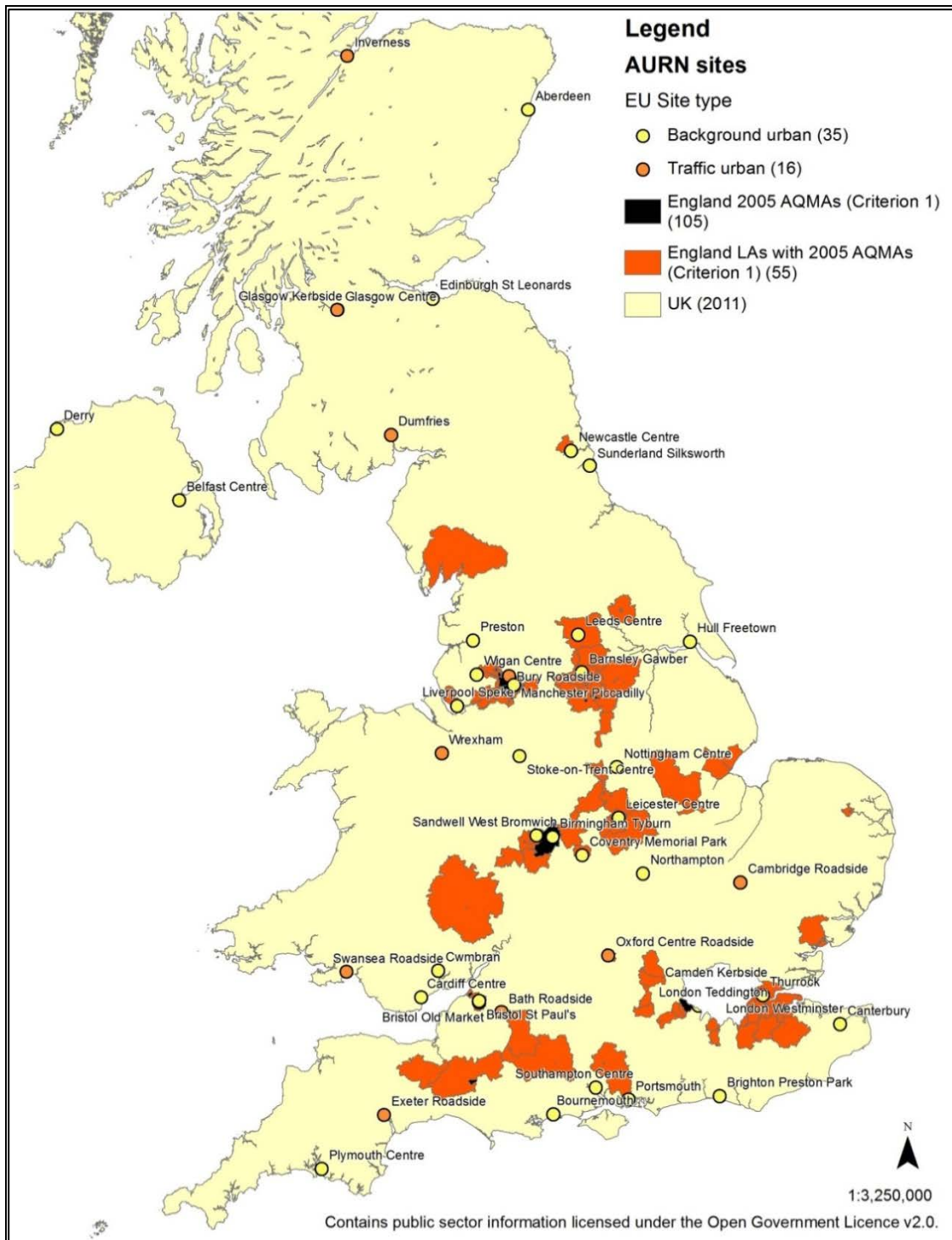


Figure 7.8: AURN sites meeting Criterion 2



Figure 7.9 shows these Criterion 2 AURN sites, together with the local authorities and AQMAs meeting Criterion 1. Given the scale it is difficult to see which AQMAs have representative Traffic Urban and Background Urban sites, however, there is a number of local authorities with AQMAs that do not appear to have AURN sites in close proximity. Section 7.3.3 examines this relationship in more detail.

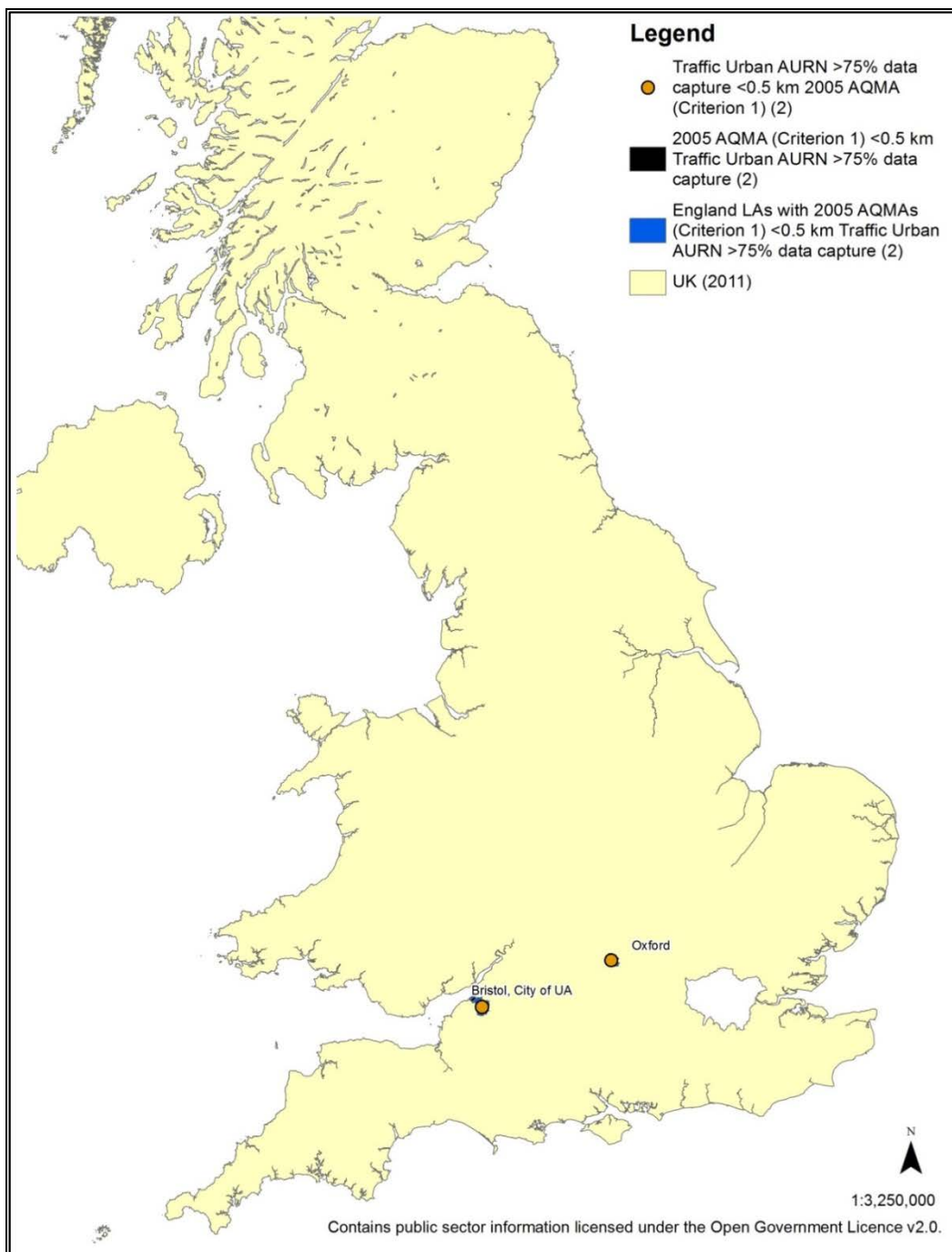


**Figure 7.9: AURN sites meeting Criterion 2 (data capture with local authorities and AQMAs meeting Criterion 1 (AQAP PRs))**



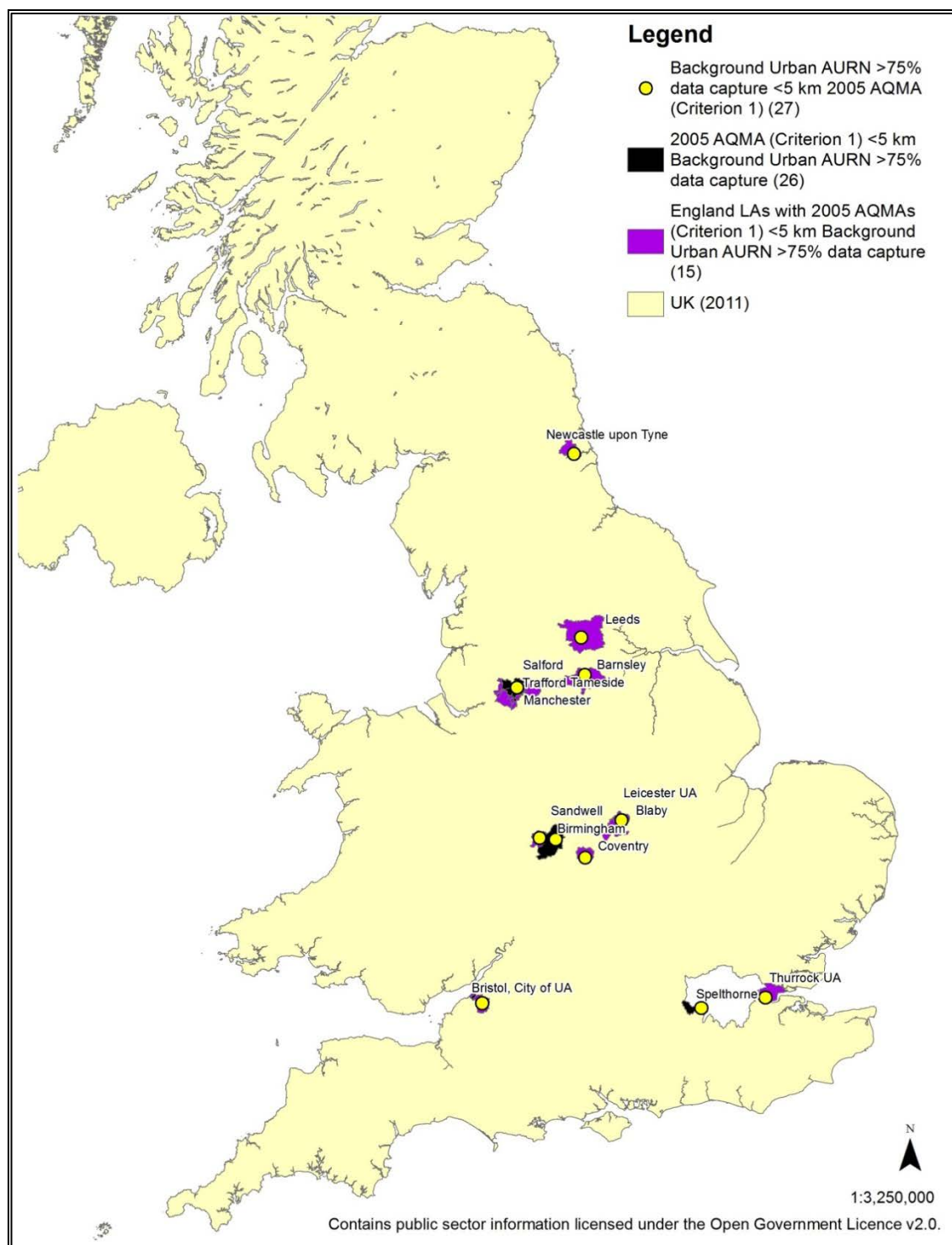
### 7.3.3. Criterion 3: Compliance with monitoring siting requirements (AURN)

AURN sites meeting Criterion 2 were selected on the basis of their proximity to the Criterion 1 AQMAs (<0.5 km for Traffic Urban sites and <5 km for Background Urban sites) (Criterion 3). Figure 7.10 shows those AQMAs and local authorities that meet all three criteria for Traffic Urban sites as well as the relevant AURN sites. Only two local authorities (Oxford CC and Bristol CC) meet all three criteria for Traffic Urban sites.



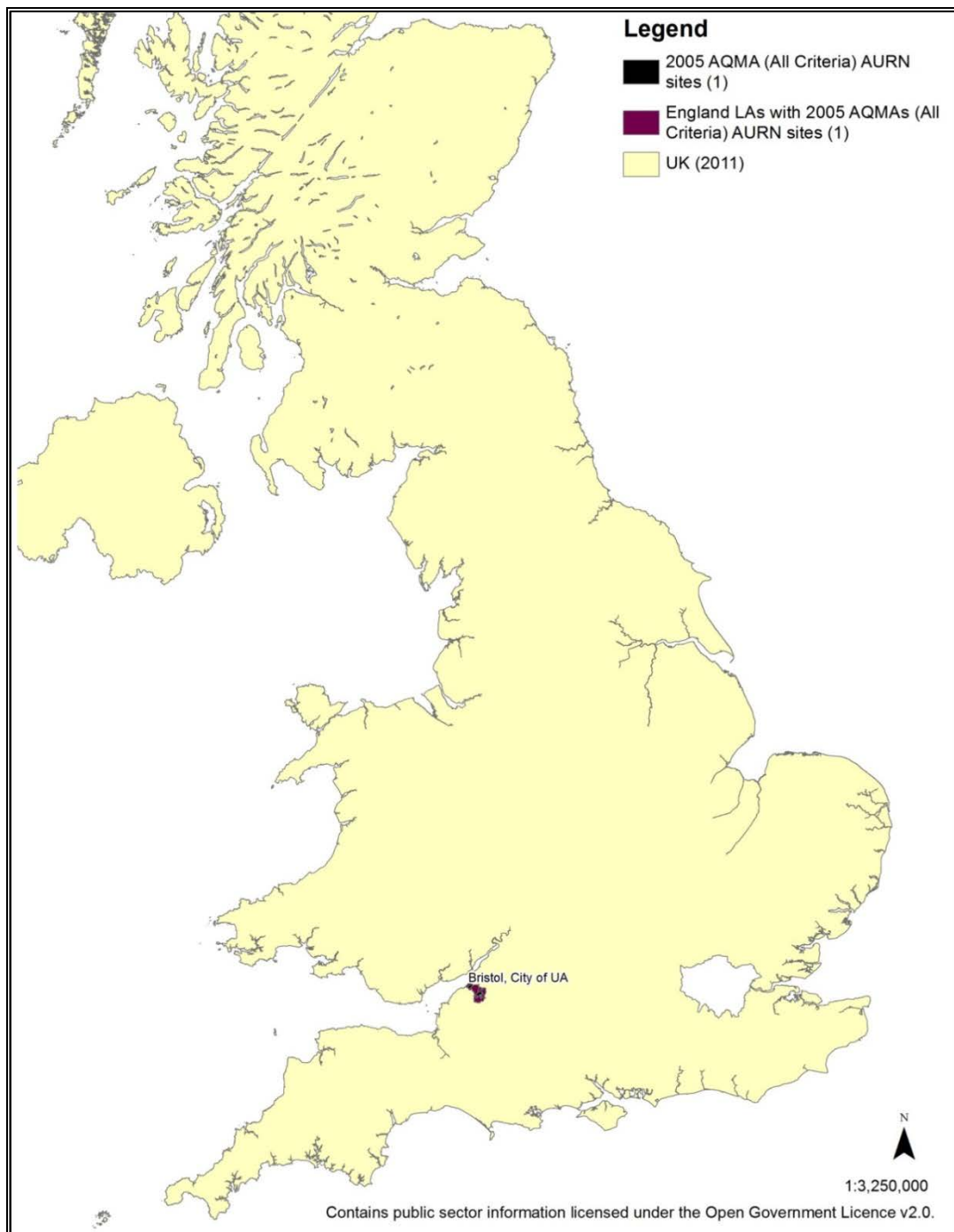
**Figure 7.10: Local authorities and AQMAs meeting all three criteria for Traffic Urban AURN sites**

Figure 7.11 shows those AQMAs and local authorities meeting all three criteria for Background Urban sites together with the relevant AURN sites. Fifteen local authorities (26 AQMAs) meet all three criteria for Background Urban sites.



**Figure 7.11: Local authorities and AQMAs meeting all three criteria for Background Urban AURN sites**

Figure 7.12 brings together the results of all three Criteria (AQAP Progress Reporting, data capture and siting requirements) to show only one local authority (Bristol CC) that meets all three with both Traffic Urban and Background Urban AURN sites. Using the AURN sites, therefore, there is insufficient data available for most AQMAs to calculate the local contribution to NO<sub>2</sub> and therefore no basis on which to judge the effectiveness of the AQAP implementations to reduce local NO<sub>2</sub>.



**Figure 7.12: England AQMA and local authority meeting all three criteria: compliance with AQAP Progress Reporting requirements and data capture and siting requirements (for both Traffic Urban and Background Urban AURN sites)**

### 7.3.4. Criterion 3: Compliance with monitoring siting requirements (Local Authority Automatic Monitors)

To supplement the AURN sites local authority automatic NO<sub>2</sub> monitors were used. Figure 7.13 shows these monitors as Traffic Urban and Background Urban sites. There is a good spatial distribution of sites, with an apparent clustering along motorway routes and in urban areas in the Midlands and northwest and more dispersed distribution in the south. There are a higher number of local authority sites than AURN sites for England.

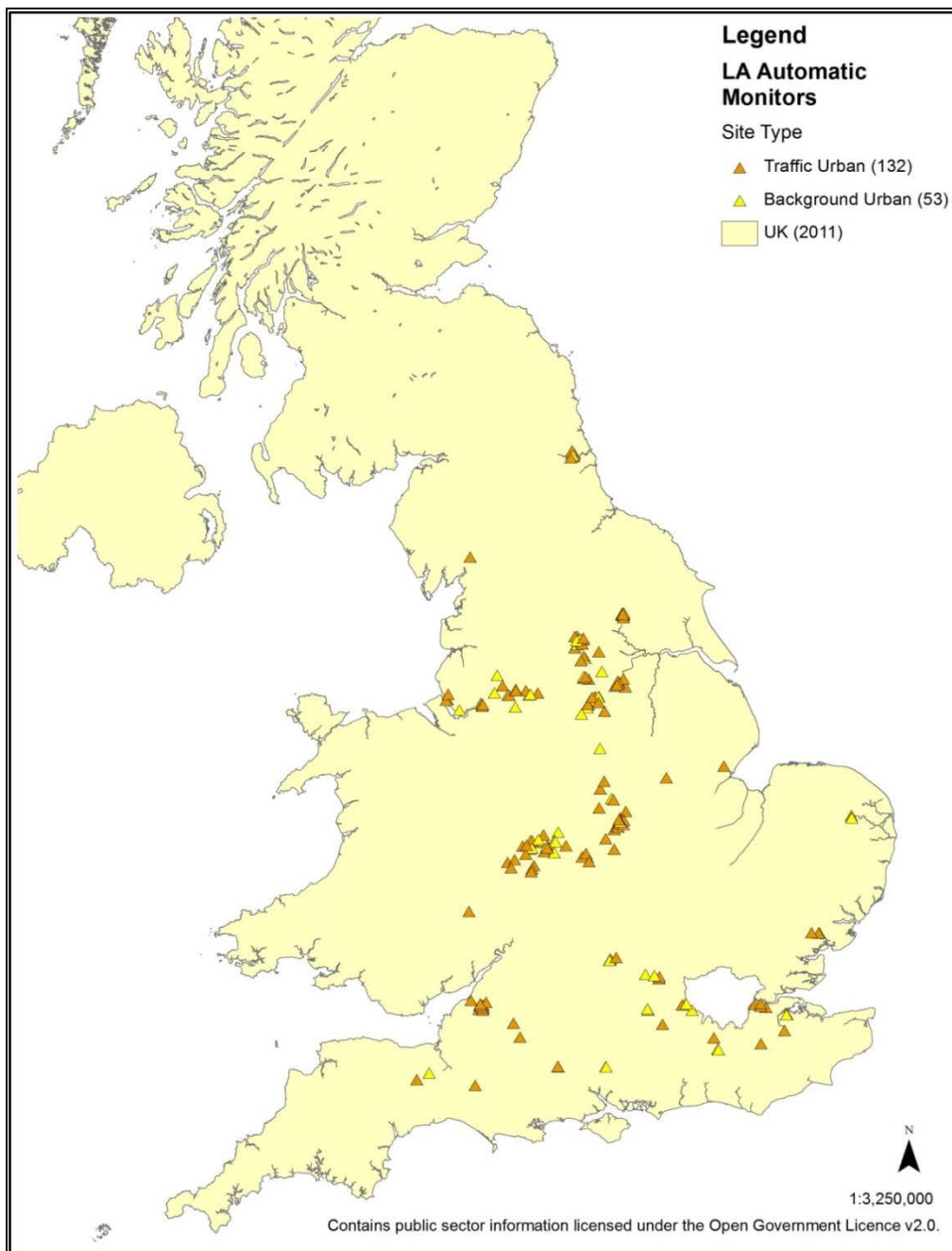
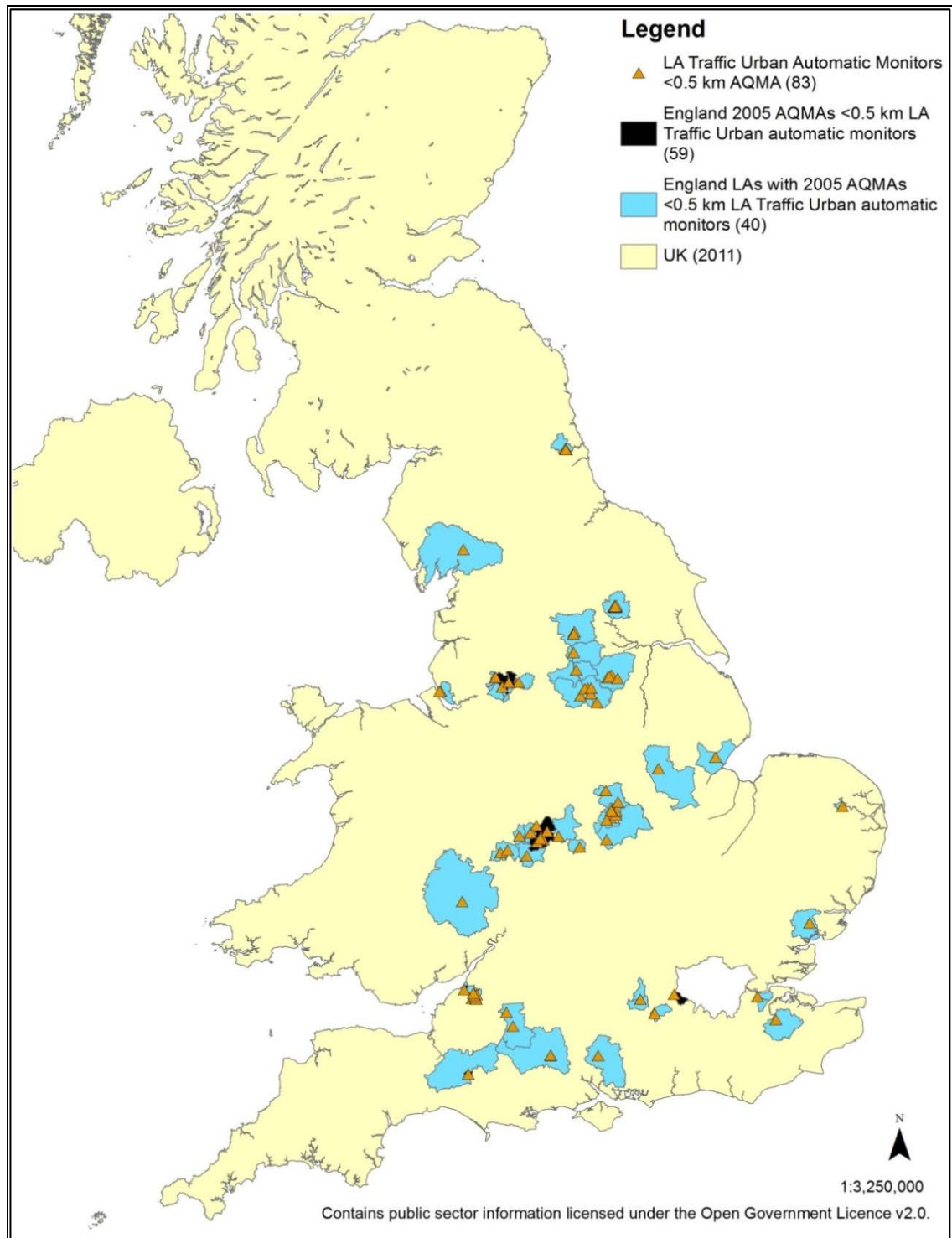


Figure 7.13: England local authority automatic NO<sub>2</sub> monitors (from local authority R&A reports)

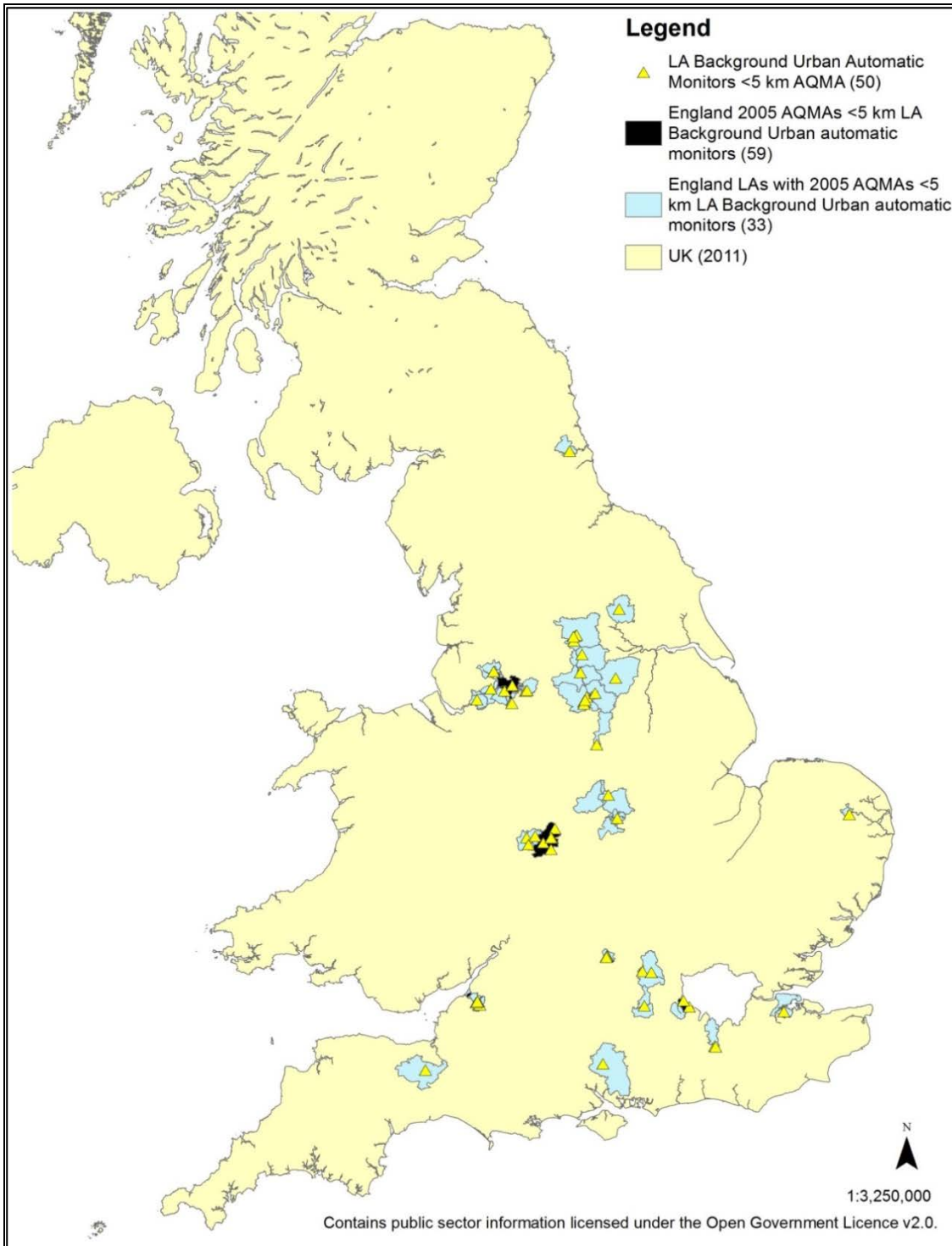
Figure 7.14 shows the Round 1 baseline local authorities with AQMAs <0.5 km from the local authority NO<sub>2</sub> Traffic Urban automatic monitors. Of the 132 local authority Traffic Urban monitors, 83 were found to be representative of 59 AQMAs in 40 local authorities. This is much better coverage than the AURN monitors, but these sites have not yet been selected for data capture >75% (Criterion 2).



**Figure 7.14: Criterion 1 and 3 local authorities and AQMAs <0.5 km from local authority NO<sub>2</sub> Traffic Urban automatic monitors**

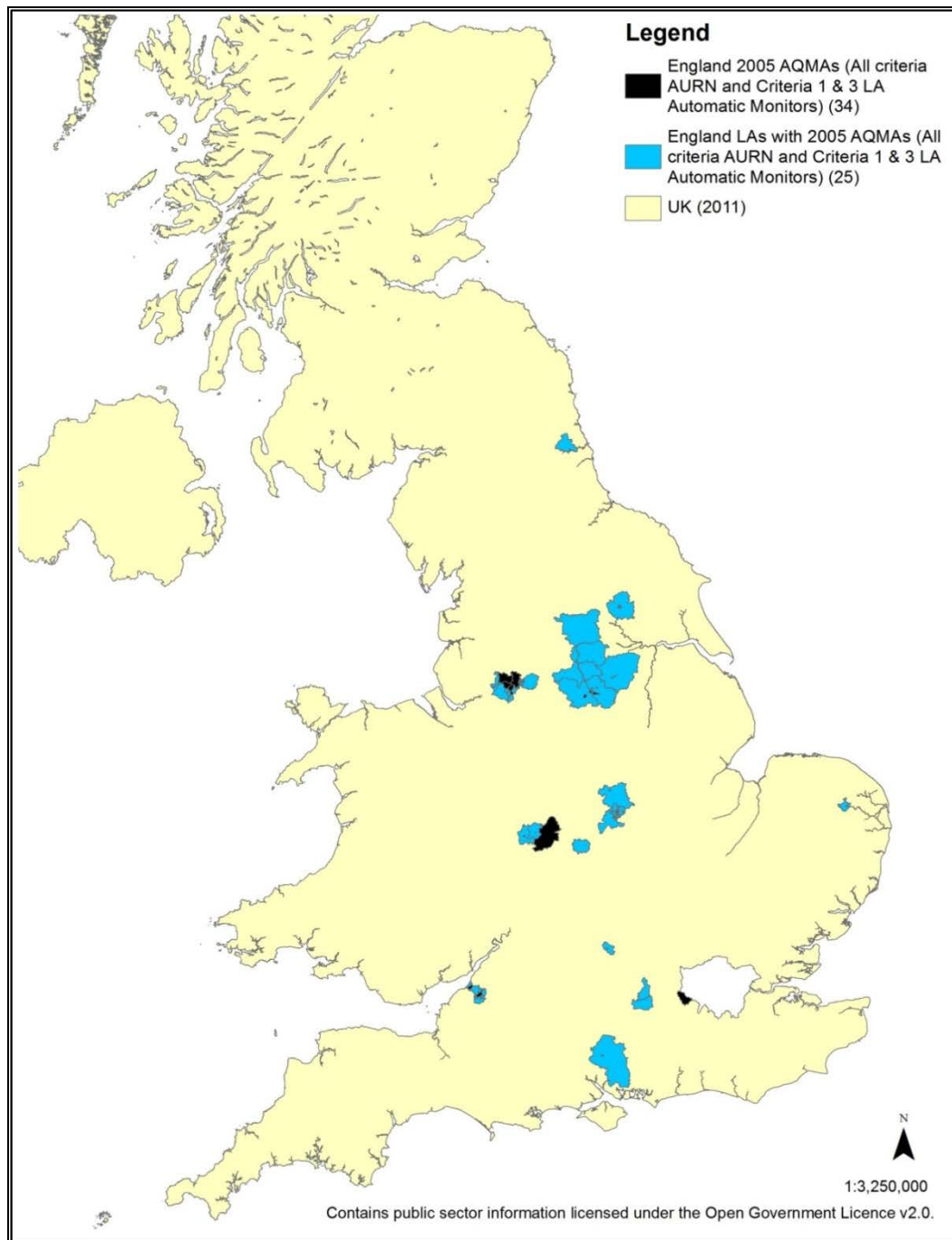


Figure 7.15 shows the Round 1 baseline local authorities with AQMAs <5 km from the local authority NO<sub>2</sub> Background Urban automatic monitors. Of the 53 local authority Background Urban monitors, 50 were found to be representative of 59 AQMAs in 33 local authorities. Again, there is much better coverage than the AURN monitors, but these sites have not yet been selected for data capture >75% (Criterion 2).



**Figure 7.15: Criterion 1 and 3 local authorities and AQMAs <5 km from local authority NO<sub>2</sub> Background Urban automatic monitors**

Figure 7.16 shows those local authorities and AQMAs for which there are both Traffic Urban and Background Urban monitors, using AURN sites that meet all three criteria (AQAP PRs, data capture and siting requirements) and local authority automatic monitors that meet Criteria 1 and 3. By narrowing down the AQMAs that had both relevant Traffic Urban and Background Urban monitoring sites, it was possible to identify the local authorities and their automatic monitors for which annual mean and data capture rates should be extracted from the Review and Assessment reports.



**Figure 7.16: England local authorities and AQMAs meeting all three criteria for AURN sites and Criteria 1 and 3 for local authority automatic monitors**

### 7.3.5. Criterion 2: Compliance with monitoring data requirements (Local Authority Automatic Monitors)

Figure 7.17 shows both Traffic Urban and Background Urban local authority NO<sub>2</sub> automatic monitors meeting Criterion 2. The effect of applying the Criterion 2 data capture requirements (annual 75% data capture and 75% data capture 2005-2012) has severely reduced the number of local authority automatic monitors from 83 Traffic Urban sites to 22, and 50 Background Urban sites to 10. There are more local authority Traffic Urban sites than in the AURN, but fewer Background Urban sites.

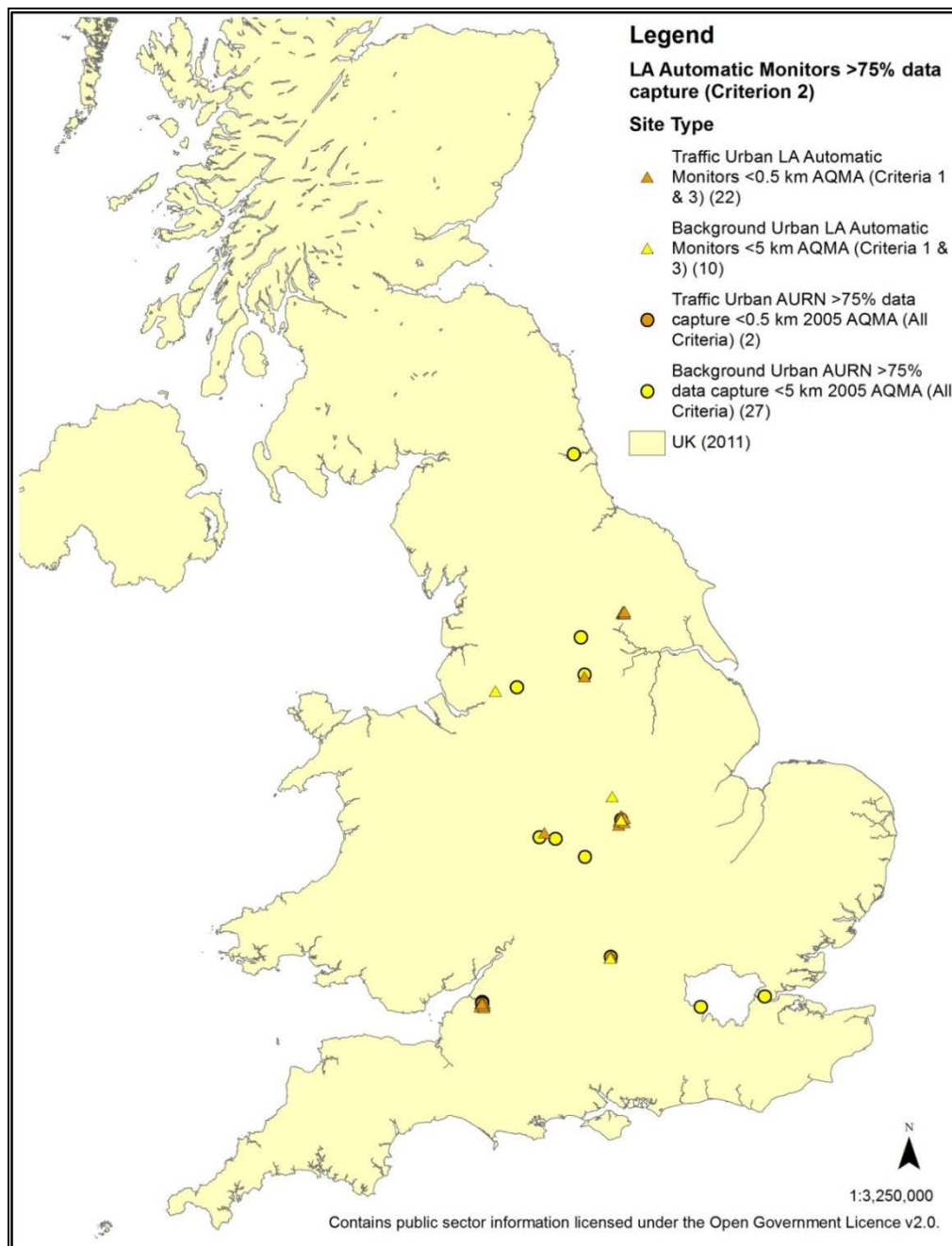
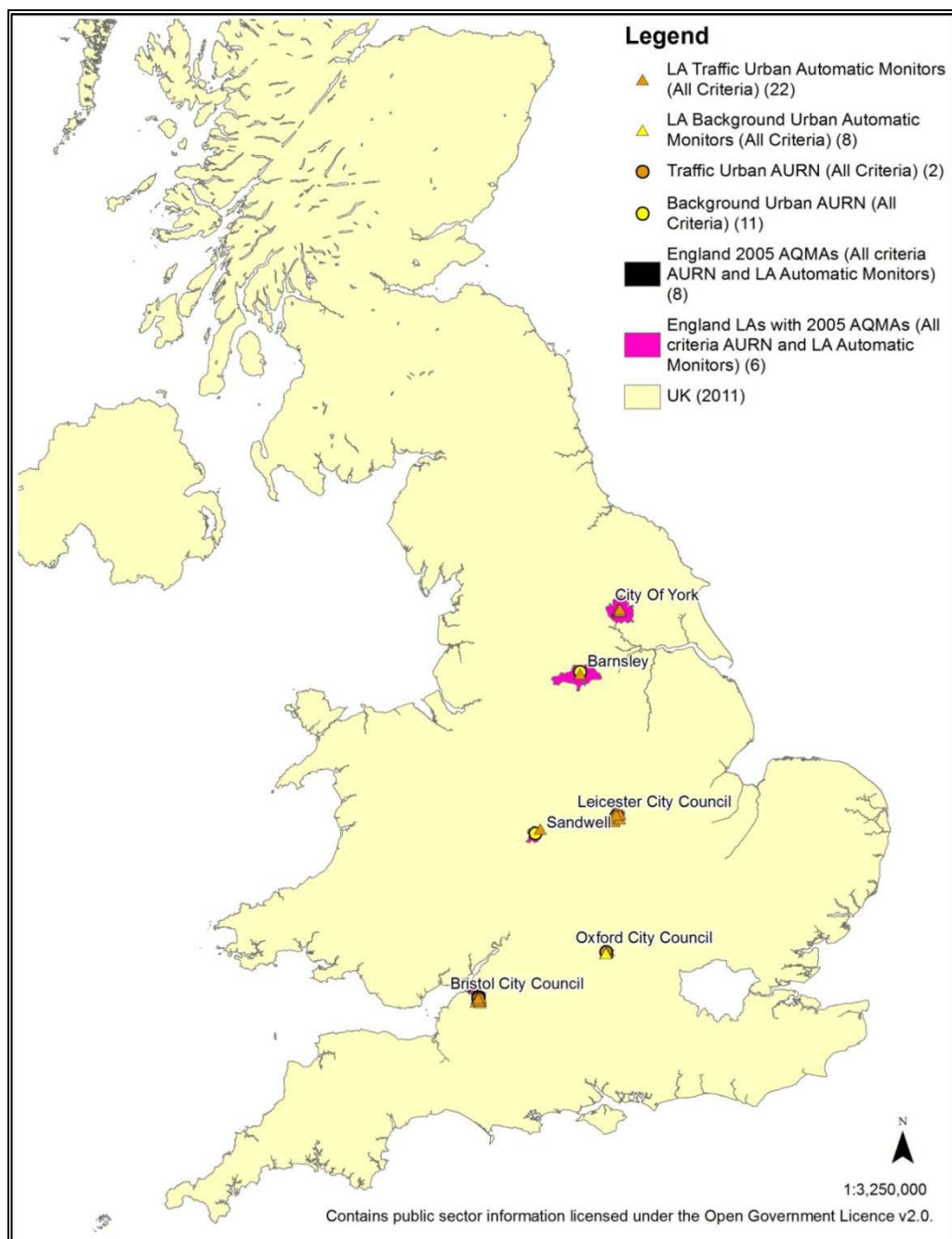


Figure 7.17: Local authority NO<sub>2</sub> automatic monitors >75% data capture with Round 1 baseline AQMAs and local authorities



Figure 7.18 shows those AQMAs and local authorities together with the relevant AURN and local authority automatic monitoring sites that meet all three criteria. There are just eight AQMAs in six local authorities with both Traffic Urban and Background Urban sites meeting all three criteria (AQAP PR, data capture and siting requirements) using both AURN and local authority automatic monitors. This represents 5% of the Round 1 baseline AQMAs and 7% of the respective local authorities. These AQMAs, although limited in number, provide a reasonable spatial coverage with two southern, two central and two northern case study areas.



**Figure 7.18: England 2005 AQMAs and local authorities meeting all three criteria for both AURN and local authority automatic monitoring sites**

## 7.4. Case studies

The filtering process described in Sections 6.2 and 7.1 and the selection of those AQMAs for which there were the means to measure the implementation of AQAP actions against local contribution nitrogen dioxide resulted in the identification of eight AQMAs in six local authorities:

- Barnsley Metropolitan Borough Council (Barnsley AQMA)
- Bristol City Council (Bristol AQMA)
- Leicester City Council (Leicester AQMA)
- Oxford City Council (Oxford AQMA)
- Sandwell Metropolitan Borough Council (Great Barr NW, Great Barr South, Great Barr SW)
- City of York Council (York AQMA)

Four of the local authorities are City Councils and two are Metropolitan Borough Councils (MBC). All, apart from Oxford CC, are therefore effectively single-tier authorities, although the MBCs share some responsibilities county-wide. Barnsley MBC, for example, is within South Yorkshire (within which the South Yorkshire Integrated Transport Authority operates), while Sandwell MBC is in the West Midlands (within which the West Midlands Integrated Transport Authority, Centro<sup>20</sup>) operates.

The following section describes each of the case study authorities in turn, with maps of their AQMAs and monitoring sites (AURN and local authority automatic monitors), before looking in more detail at their monitoring data and AQAP implementation.

### 7.4.1. Barnsley MBC (Barnsley AQMA)

Barnsley is one of four Metropolitan Borough Councils in South Yorkshire in the north-east of England. It covers 329 km<sup>2</sup> and has a population of approximately 231,900 (2011). Barnsley MBC is divided by the M1 motorway, with the main urban area of Barnsley to the east. The first AQMA (Barnsley AQMA) was declared on 3<sup>rd</sup> October 2001, along the length of the M1 between Junctions 35a and 38, 100 m either side of the central reservation, and includes an estimated 265 domestic dwellings. Appendix 8. Figure 1 shows the extent of the AQMA, including a minor revision to the extremities of the AQMA in the 2006 edition of the Defra spatial dataset (which is not considered to have had an effect on the Methodology of this research). The AQMA was declared on

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<sup>20</sup>Formerly the West Midlands Passenger Transport Executive.

the basis of local authority passive diffusion tube monitoring and consultant's modelling, which indicated that the annual mean objective would not be achieved at two receptor locations in Dodworth. The main sources were found to be the M1 and A628 traffic, with the main contributor to NO<sub>x</sub> emissions from Heavy Goods Vehicles (HGVs). A further five AQMAs were declared in Barnsley MBC between 2005 and 2008 following the discovery of more widespread exceedences on other local roads and junctions. Appendix 8. Figure 1 also shows the AURN and local authority automatic monitoring sites, which are described in more detail in Section 7.5.1.

#### **7.4.2. Bristol CC (Bristol AQMA)**

Bristol CC is a Unitary Authority in the south-west of England. Despite being Unitary, Bristol CC has retained links with its former-Avon neighbouring authorities (Bath and North East Somerset, North Somerset and South Gloucestershire Councils) as the West of England Local Enterprise Partnership, including in the production of Joint Local Transport Plans. Bristol CC covers 110 km<sup>2</sup> with a population of approximately 428,200 (and more than 1 million in the larger urban area). The original AQMA was declared on 1<sup>st</sup> May 2001 (amended slightly in 2003) to cover the City Centre (including the main radial roads) and Avonmouth Docks (relating to the M5/M49 Junction) (Appendix 8. Figure 2). In 2008, the Avonmouth part of the AQMA was revoked and the City Centre AQMA extended to the north-east (Appendix 8. Figure 3). According to the AQAP (April 2004) the main source of NO<sub>x</sub> emissions is road traffic (70%) with cars and taxis contributing the largest proportion (39%) due to the large proportion of these vehicles on the roads. Appendix 8. Figure 3 also shows the monitoring sites, which are described in more detail in Section 7.5.2.

#### **7.4.3. Leicester CC (Leicester AQMA)**

Leicester CC is a Unitary Authority in Leicestershire in the East Midlands, with an area of 73 km<sup>2</sup> and a 2011 population of approximately 330,000. Leicester CC declared its AQMA on 4<sup>th</sup> December 2000 on the basis of predicted exceedences of the NO<sub>2</sub> annual mean objective in the City Centre's radial road network (Appendix 8. Figure 4). 95% of measured NO<sub>2</sub> in Leicester was attributable to road traffic with heavy vehicles contributing 60% NO<sub>x</sub> emissions. Appendix 8. Figure 4 also shows the monitoring sites, which are described in more detail in Section 0.

#### **7.4.4. Oxford CC (Oxford AQMA)**

Oxford City Council is the only non-Metropolitan authority among the case studies, operating a two-tier system with Oxfordshire County Council managing Transport and the City Council managing Air Quality. The City and non-Metropolitan area are located

in south-central England and cover 45.6 km<sup>2</sup> with a population of approximately 244,000 (2011). The original AQMA was declared on 1<sup>st</sup> September 2001 (amended September 2003) and included the main roads around the City Centre (Appendix 8. Figure 5). This was later expanded to include the whole of Oxford in 2010 (Appendix 8. Figure 6). Emissions of NO<sub>x</sub> from local traffic were estimated to account for up to 80%, with the main contribution from buses, further hampered by congestion and canyon street topography. Appendix 8. Figure 5 also shows the monitoring sites, which are further described in Section 0.

#### **7.4.5. Sandwell MBC (Great Barr NW, Great Barr South, Great Barr SW)**

Sandwell MBC is a Unitary Authority in the West Midlands, neighbouring Birmingham. It covers 86 km<sup>2</sup> and has a population of approximately 309,000 (2011). Most of the area is urbanised with the densely populated areas in and around West Bromwich and Oldbury. The M5 motorway runs through Sandwell and the M6 intersects its north-east corner. In August 2002 Sandwell declared six AQMAs on the basis of predicted exceedences of the 2005 annual mean nitrogen dioxide objective. Three of these sites are included in the case study for Sandwell: Great Barr NW, Great Barr South and Great Barr SW (Appendix 8. Figure 7). All three are adjacent to the M6 and the high concentrations of monitored NO<sub>2</sub> are associated with congestion at Junctions 7 and 8 and connected routes, including the M5 East Link and A34. Following the identification of a number of other exceedences across the authority, the whole of Sandwell was declared an AQMA in July 2005 (but after the production of Defra's 2005 AQMA spatial dataset) (Appendix 8. Figure 8). Appendix 8. Figure 8 also shows the monitoring sites, which are described in more detail in Section 7.5.5.

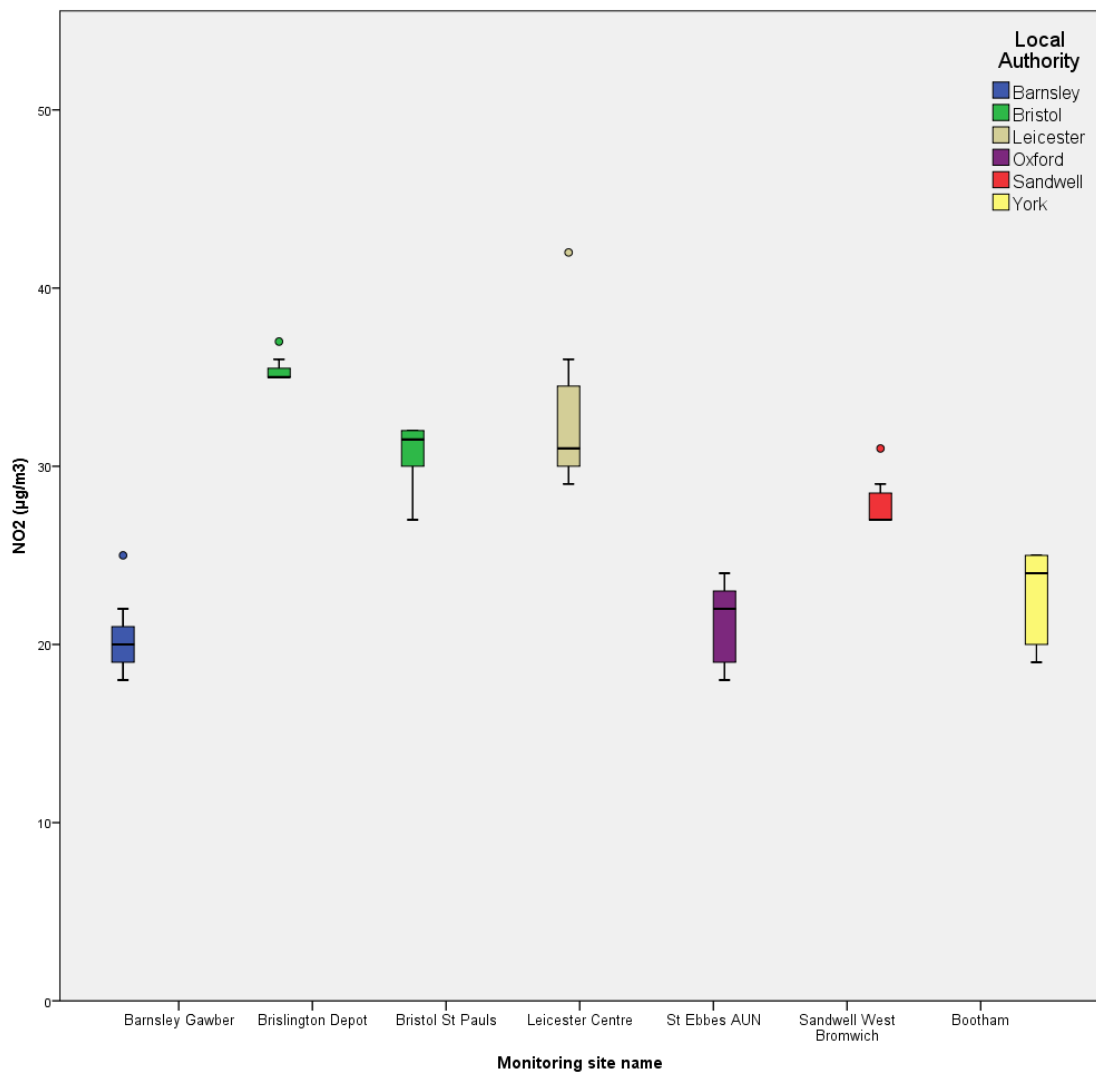
#### **7.4.6. City of York Council (York AQMA)**

City of York Council is a Unitary Authority in North Yorkshire. York covers an area of 272 km<sup>2</sup> with a population of approximately 197,800 (2011). York declared its first AQMA on 21<sup>st</sup> January 2002 covering the City Centre's inner ring-road and radial routes (Appendix 8. Figure 9) on the basis of modelled exceedences. Road traffic was found to be the main source of NO<sub>x</sub> emissions in the AQMA with the largest contribution, fairly equitably, from HGVs and cars. A second AQMA was declared to the south of the City Centre AQMA in April 2010 and a third was declared in May 2012. In addition, the City Centre AQMA was also expanded in 2012 to account for additional areas of exceedence, including some exceedences of the hourly objective for NO<sub>2</sub>. Appendix 8. Figure 9 also shows the monitoring sites, which are described in more detail in Section 7.5.6.

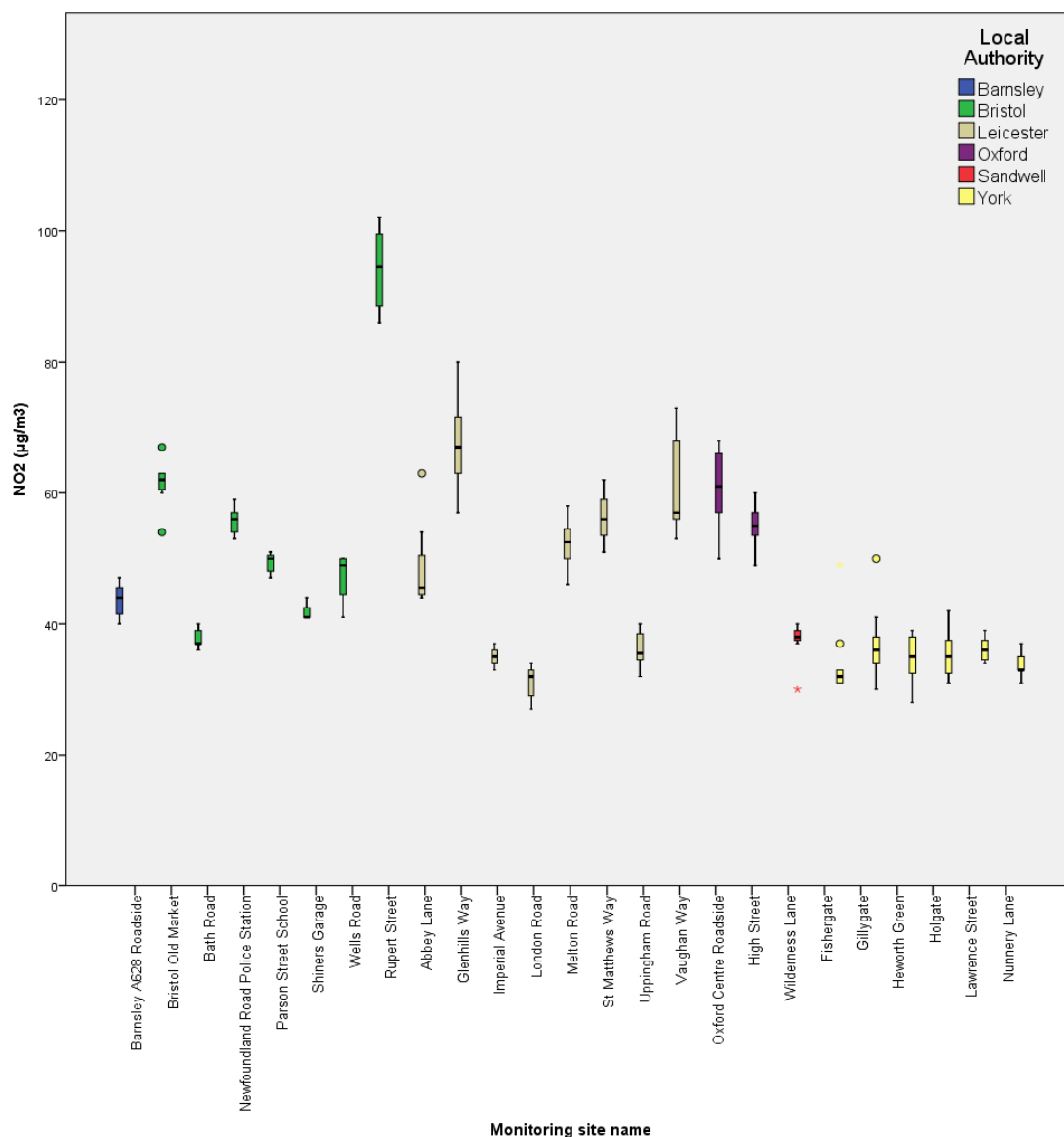
## 7.5. Monitoring sites and data

Across the six case study local authorities there were seven Background Urban monitoring sites (Figure 7.19) and 25 Traffic Urban sites (Figure 7.20) that had met the siting and data requirements. Data capture rates for these monitoring sites are presented in Appendix 1 Appendix 9:. From these data, trends in local contribution nitrogen dioxide concentrations were calculated as the difference between matched Traffic Urban sites and Background Urban sites for each AQMA as per Stedman *et al.* (2013) (Figure 7.21).

As these boxplots show, there is variation in the means and ranges of annual mean concentrations over the period 2004-2012 between sites. Barnsley Gawber had the lowest mean NO<sub>2</sub> concentrations of all the Background Urban sites (20 µg/m<sup>3</sup>), the highest being Brislington Depot (Bristol), with (35 µg/m<sup>3</sup>). The ranges and the outliers present at most sites also indicate annual variation within sites.

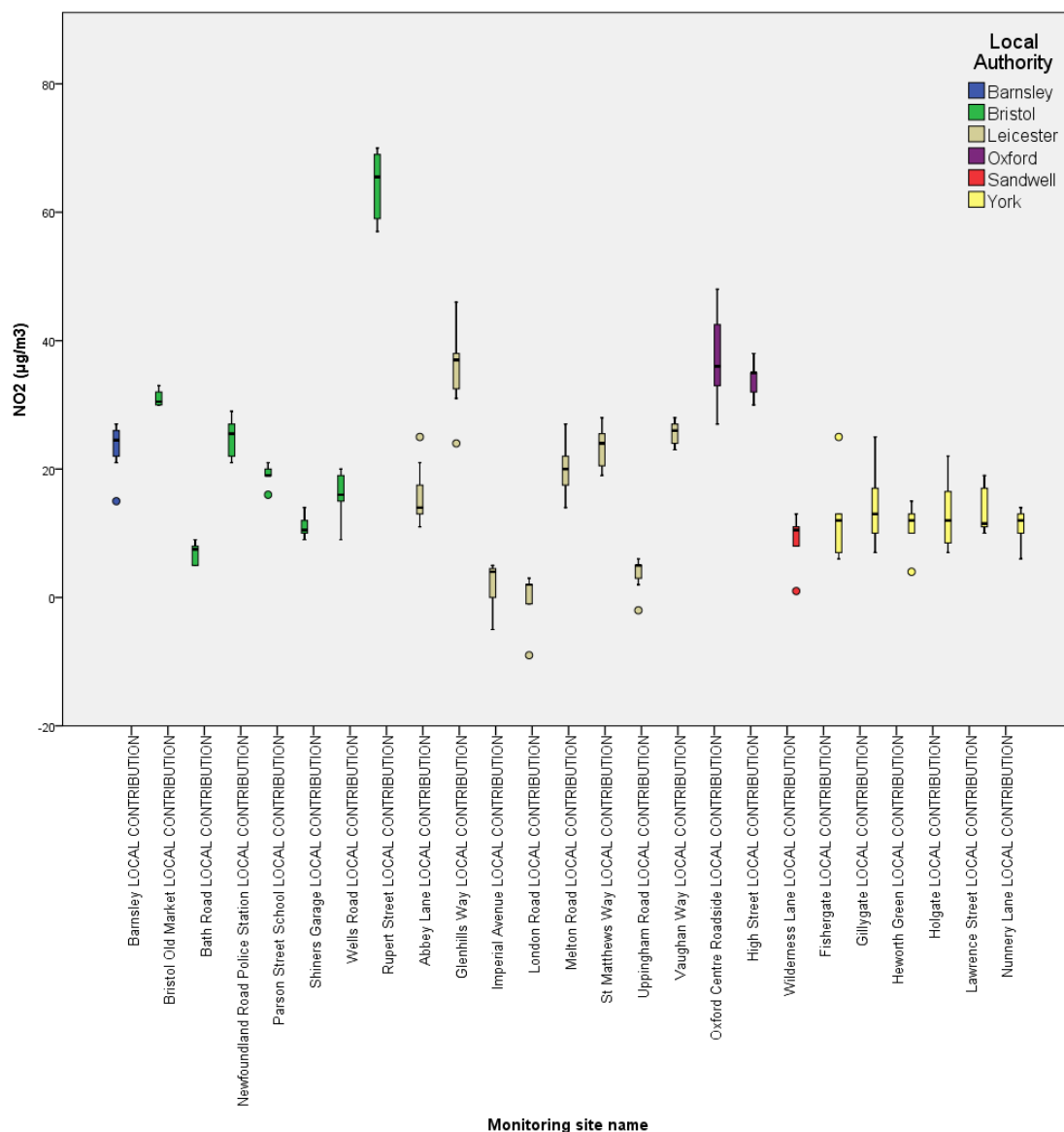


**Figure 7.19: Boxplots of annual mean nitrogen dioxide concentrations at case study Background Urban sites 2004-2012**



**Figure 7.20: Boxplots of annual mean nitrogen dioxide concentrations at case study Traffic Urban sites 2004-2012**

Figure 7.20 also shows the variation in the number of relevant sites for each local authority, with some (e.g. Barnsley and Sandwell MBCs) having only one Traffic Urban monitoring station, while others (e.g. Bristol and Leicester CCs) have up to seven or eight sites. There is also wide variability in the annual mean concentrations recorded at different sites relevant to the same AQMAs, e.g. Bristol’s Rupert Street has concentrations exceeding  $100 \mu\text{g}/\text{m}^3$ , whereas Bath Road site is below the annual mean objective ( $40 \mu\text{g}/\text{m}^3$ ). At York, however, five of the six Traffic Urban sites are all within the same range ( $\sim 35\text{-}40 \mu\text{g}/\text{m}^3$ ). While automatic analysers were selected as preferential in order to minimise the variability between data, it is worth restating that there are still uncertainties of  $\pm 15\%$  inherent in these data (Defra, 2009).



**Figure 7.21: Boxplots of calculated local contribution annual mean nitrogen dioxide concentrations at case study monitoring sites 2004-2012**

The variability in Background Urban and Traffic Urban sites identified above is translated into the Local Contribution NO<sub>2</sub> calculations presented in Figure 7.21. Concentrations of local contribution NO<sub>2</sub> range from below zero (e.g. Imperial Avenue and London Road, Leicester) up to 70 µg/m<sup>3</sup> (e.g. Rupert Street, Bristol). Clearly, those local contribution calculations below zero are incorrect based on the available Traffic Urban and Background Urban monitoring sites, suggesting that one or either may not be representative. Local contribution nitrogen dioxide concentrations are discussed for each of the respective local authorities in sections 7.5.1 to 7.5.6 below.



**Table 7.1: Regression analysis results**

Site name	Site type	Gradient	Std. Error	df	t	95% Sig. <sup>1</sup>	95% Lower Bound	95% Upper Bound
Barnsley Gawber	Background	0.150	0.287	7	0.522	0.618	-0.529	0.829
Bristol St Pauls	Background	-0.229	0.513	4	-0.446	0.679	-1.653	1.196
Brislington Depot	Background	0.156	0.128	5	1.214	0.279	-0.174	0.486
Leicester Centre	Background	-0.075	0.667	6	-0.113	0.914	-1.708	1.557
St Ebbes AUN	Background	-0.250	0.486	5	-0.514	0.629	-1.500	1.000
Bootham	Background	0.617	0.243	7	2.541	0.039	0.043	1.191
Sandwell West Bromwich	Background	0.279	0.235	5	1.185	0.289	-0.326	0.884
Barnsley A628 Roadside	Traffic	-0.798	0.245	6	-3.253	0.017	-1.398	-0.198
Bristol Old Market	Traffic	1.000	0.685	5	1.460	0.204	-0.761	2.761
Bath Road	Traffic	-0.286	0.376	4	-0.760	0.490	-1.330	0.759
Newfoundland Road Police Station	Traffic	-0.496	0.346	5	-1.434	0.211	-1.385	0.393
Parson Street School	Traffic	0.037	0.297	5	0.124	0.906	-0.727	0.801
Shiners Garage	Traffic	-0.033	0.225	5	-0.146	0.890	-0.611	0.545
Wells Road	Traffic	-1.377	0.386	5	3.572	0.016	-2.368	-0.386
Rupert Street	Traffic	-0.437	0.849	6	-0.514	0.625	-2.515	1.642
Abbey Lane	Traffic	1.190	1.005	6	1.185	0.281	-1.268	3.649
Glenhills Way	Traffic	1.048	1.155	6	0.907	0.399	-1.777	3.873
Imperial Avenue	Traffic	0.167	0.207	6	0.804	0.452	-0.341	0.674
London Road	Traffic	-0.371	0.681	4	-0.546	0.614	-2.261	1.518
Melton Road	Traffic	0.238	0.614	6	0.388	0.712	-1.265	1.741
St Matthews Way	Traffic	0.048	0.622	6	0.077	0.941	-1.474	1.569
Uppingham Road	Traffic	-0.417	0.435	6	-0.959	0.375	-1.480	0.647
Vaughan Way	Traffic	3.886	0.838	4	4.639	0.010	1.560	6.211
Oxford Centre Roadside	Traffic	-1.083	0.813	7	-1.333	0.224	-3.006	0.839
High Street	Traffic	0.607	0.685	5	0.886	0.416	-1.154	2.368
Fishergate	Traffic	0.483	0.786	7	0.615	0.558	-1.375	2.342
Gillygate	Traffic	0.850	0.774	7	1.098	0.308	-0.980	2.680
Heworth Green	Traffic	0.821	0.804	5	1.021	0.354	-1.246	2.889
Holgate	Traffic	-0.633	0.447	6	-1.418	0.206	-1.726	0.460
Lawrence Street	Traffic	-0.338	0.239	6	-1.413	0.207	-0.922	0.247
Nunnery Lane	Traffic	0.400	0.231	7	1.732	0.127	-0.146	0.946
Wilderness Lane	Traffic	0.071	0.693	5	0.103	0.922	-1.711	1.854
Barnsley LOCAL CONTRIBUTION	Local contribution	-0.940	0.530	6	-1.775	0.126	-2.237	0.356
Bristol Old Market LOCAL CONTRIBUTION	Local contribution	0.600	0.648	2	0.926	0.452	-2.188	3.388
Bath Road LOCAL CONTRIBUTION	Local contribution	-0.057	0.446	4	-0.128	0.904	-1.296	1.182
Newfoundland Road Police Station LOCAL CONTRIBUTION	Local contribution	-0.686	0.735	4	-0.933	0.403	-2.725	1.354
Parson Street School LOCAL CONTRIBUTION	Local contribution	-0.286	0.424	4	-0.674	0.537	-1.462	0.891
Shiners Garage LOCAL CONTRIBUTION	Local contribution	0.457	0.420	4	1.089	0.338	-0.709	1.623
Wells Road LOCAL CONTRIBUTION	Local contribution	-1.743	0.582	4	-2.997	0.040	-3.358	-0.128
Rupert Street LOCAL CONTRIBUTION	Local contribution	-2.857	0.541	4	-5.283	0.006	-4.359	-1.356



Site name	Site type	Gradient	Std. Error	df	t	95% Sig. <sup>1</sup>	95% Lower Bound	95% Upper Bound
Abbey Lane LOCAL CONTRIBUTION	Local contribution	1.929	0.614	5	3.143	0.026	0.351	3.506
Glenhills Way LOCAL CONTRIBUTION	Local contribution	2.286	0.976	5	2.341	0.066	-0.224	4.795
Imperial Avenue LOCAL CONTRIBUTION	Local contribution	-0.107	0.847	5	-0.126	0.904	-2.285	2.071
London Road LOCAL CONTRIBUTION	Local contribution	-1.500	1.578	3	-0.951	0.412	-6.522	3.522
Melton Road LOCAL CONTRIBUTION	Local contribution	0.893	0.800	5	1.116	0.315	-1.165	2.950
St Matthews Way LOCAL CONTRIBUTION	Local contribution	-0.107	0.713	5	-0.150	0.886	-1.939	1.725
Uppingham Road LOCAL CONTRIBUTION	Local contribution	-0.393	0.544	5	-0.722	0.502	-1.791	1.005
Vaughan Way LOCAL CONTRIBUTION	Local contribution	1.000	0.490	3	2.041	0.134	-0.559	2.559
Oxford Centre Roadside LOCAL CONTRIBUTION	Local contribution	-1.214	1.400	5	-0.867	0.425	-4.813	2.385
High Street LOCAL CONTRIBUTION	Local contribution	0.857	0.399	5	2.148	0.084	-0.168	1.883
Wilderness Lane LOCAL CONTRIBUTION	Local contribution	-0.261	0.906	4	-0.288	0.788	-2.777	2.256
Fishergate LOCAL CONTRIBUTION	Local contribution	-0.133	0.818	7	-0.163	0.875	-2.068	1.801
Gillygate LOCAL CONTRIBUTION	Local contribution	0.233	0.774	7	0.301	0.772	-1.597	2.064
Heworth Green LOCAL CONTRIBUTION	Local contribution	0.536	0.707	5	0.758	0.483	-1.281	2.353
Holgate LOCAL CONTRIBUTION	Local contribution	-1.250	0.525	6	-2.382	0.055	-2.534	0.034
Lawrence Street LOCAL CONTRIBUTION	Local contribution	-0.943	0.352	6	-2.681	0.037	-1.803	-0.082
Nunnery Lane LOCAL CONTRIBUTION	Local contribution	-0.217	0.341	7	-0.636	0.545	-1.022	0.589

<sup>1</sup> Significant trends (95% confidence interval) shaded in pink with dark red font

Linear regression trends in NO<sub>2</sub> concentrations at all sites, and for the local contribution calculations, are presented in Table 7.1, tested for significance at the 95% confidence threshold using the Student t test. Only eight of the trends were significantly different to zero: Bootham (Background), Barnsley A628 Roadside, Wells Road (Roadside and Local contribution), Vaughan Way (Roadside), Rupert Street (Local contribution), Abbey Lane (Local contribution) and Lawrence Street (Local contribution). Significant trends range from -2.857 (Rupert Street Local Contribution) to 3.886 (Vaughan Way). Trends for all sites are presented in Appendix 1 Appendix 10: with significant trends presented and discussed for each of the respective local authorities in sections 7.5.1 to 7.5.6 below.

### 7.5.1. Barnsley MBC (Barnsley AQMA)

There was one Background Urban (AURN) site (Barnsley Gawber) and one Traffic Urban (LA) site (Barnsley A628 Roadside) that were considered to be representative of the Barnsley AQMA.

#### **7.5.1.1. Barnsley Gawber (AURN) (Background Urban)**

The Barnsley Gawber AURN monitoring station (432524, 407478) is sited within an existing building located on the edge of a sports field surrounded on two sides by residential properties (Figure 7.22). The site is situated approximately 290 m from the nearest main road, Wilthorpe Road (A635). The surrounding area comprises of open space and nearby residential premises.



**Figure 7.22: Barnsley Gawber AURN (Background Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

### 7.5.1.2. **Barnsley A628 Roadside (Traffic Urban)**

The Barnsley A628 Roadside monitoring station is located at Pogmoor Crossroads (432680, 406174) (Figure 7.23). The location is approximately 3.5 m from the kerb, classifying the site as roadside. The nearest property façade is approximately 30 m away, at the other side of the crossroads. The monitoring station is located in the A628 AQMA (AQMA 2A).



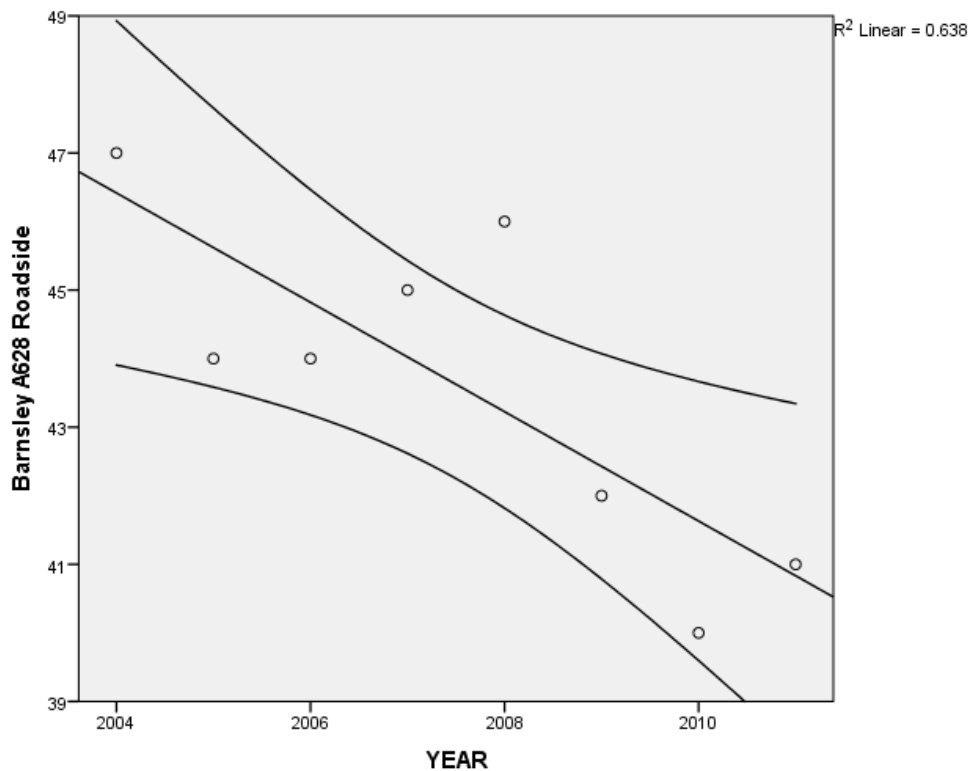
**Figure 7.23: Barnsley A628 Roadside (Traffic Urban) site (captured from Google Maps Street View)**

### 7.5.1.3. **Monitoring data**

The Barnsley A628 Roadside continuous monitor used in this study as representative of local concentrations relating to AQMA 1, is located within, and therefore probably more representative of AQMA 2A. This AQMA, along with AQMA 2B, was declared in 2005, though after the July 2005 GIS AQMA dataset had been compiled. Annual mean NO<sub>2</sub> concentrations at this Traffic Urban site, though still just above the objective in 2011, have shown a slight decrease in the last three years' reported data (Figure 7.24). Analysis shows that there is a statistically significant negative gradient ( $\hat{\beta} = -0.798$ ) in the data for Barnsley A628 Roadside (Traffic Urban) ( $t = -3.253$ ,  $df = 6$ ,  $p = 0.017$ , two-sided) (Table 7.1 and Figure 7.24). In contrast Background Urban concentrations fell steadily from 2004 to 2007, but have gradually increased year-on-year thereafter, resulting in no significant linear trend overall (Appendix 10. Figure 1).

Assuming that the Barnsley Gawber site is representative of Background Urban concentrations in AQMA 2A (the two monitors are 1.3 km apart and so this is

considered acceptable), the recent decline in Traffic Urban concentrations appears therefore to be due to a reduction in local contribution, however this has not translated into a significant trend in local contribution NO<sub>2</sub>, being masked by the increasing Background Urban concentrations (Appendix 10. Figure 3). Over the eight years from 2004, the overall reduction in local contribution NO<sub>2</sub> was only 4 µg/m<sup>3</sup>, a reduction of 16%. 2010 appears to be an atypical year in all Barnsley's plots. The unusually high NO<sub>2</sub> concentrations recorded at the Barnsley Gawber Background Urban site in 2010, coincided with particularly low concentrations measured at the Traffic Urban site in this year, resulting in a very low local contribution NO<sub>2</sub> calculation for 2010. Defra reported unusually high NO<sub>x</sub> and NO<sub>2</sub> measurements at a number of background AURN sites in 2010 (Defra, 2012), but it is unclear why this corresponded with lower Traffic Urban concentrations at the Barnsley A628 Roadside site.



**Figure 7.24: Barnsley Traffic Urban automatic monitoring data 2004-2011 showing Barnsley A626 NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**

### **7.5.2. Bristol CC (Bristol AQMA)**

There were two Background Urban sites (Bristol St Paul's (AURN) and Brislington Depot (LA), and seven Traffic Urban sites (Bristol Old Market (AURN), Newfoundland Way Police Station (LA), Bath Road (LA), Parson Street School (LA), Shiner's Garage (LA), Wells Road (LA) and Rupert Street (LA)) that were considered representative of the Bristol AQMA.

#### **7.5.2.1. Bristol St Paul's (AURN) (Background Urban)**

Bristol St Paul's AURN monitoring station (359494, 173930) is located within a self-contained, air conditioned unit within the car park of a day nursery (Figure 7.25). The monitoring station is approximately 30 m south east of Wilder Street, a lightly trafficked urban back street. The surrounding area is primarily residential, with some commercial premises in the immediate vicinity.



**Figure 7.25: Bristol St Paul's AURN (Background Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

### **7.5.2.2. Brislington Depot (Background Urban)**

Brislington depot (361180, 171559) is a transport depot off the A4 Bath Road at Arno's Vale and is a few hundred metres away from the southern end of the Spine Road linking the Bath Road with the M32 (Figure 7.26). It is a highly trafficked, though relatively open, area and, as the sample inlet is on the building façade and some 20 - 30 m from the road side the concentrations of NO<sub>2</sub> are comparatively low. The height of the sample inlet is approximately 3 m above ground.

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**Figure 7.26: Brislington Depot (Background Urban) site (from <http://www.bristol.airqualitydata.com>)**

### **7.5.2.3. Bristol Old Market (AURN) (Traffic Urban)**

Bristol Old Market AURN monitoring station (359555, 173173) is located within a self-contained, air conditioned unit adjacent to a building (Figure 7.27). The surrounding area is urban in nature comprising retail and business premises. The nearest road, the A4044 Temple Way Underpass is approximately 10 m from the instrument to the kerbside. The traffic flow along the A4044 is approximately 34,500 vehicles per day. The sample inlet is approximately 2.5 m above ground level. This site was disaffiliated from the national network in August 2012 and ceased monitoring in January 2013 having been deemed not to meet the EU siting criteria due to its location at a busy junction (Eaton, 2010).



**Figure 7.27: Bristol Old Market AURN (Traffic Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

#### **7.5.2.4. Newfoundland Way Police Station (Traffic Urban)**

As part of the Broadmead Expansion development a site was commissioned to monitor the effects of both the construction and operation phase of the development. The developers predicted an increase in traffic flows and congestion in the area around Newfoundland Way. A site was identified (359644, 173681) in the covered car park of the, then, Avon Probation Services offices (which have subsequently been taken over by Avon and Somerset Police) and monitoring for NO<sub>2</sub> commenced in November 2004 (Figure 7.28). The sample inlet for this site is approximately 8 m from the roadside. Although the site is not as close to the development site or roadside as would be desired, it is suitable for monitoring the effect on air quality of the development.

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**Figure 7.28: Bristol Newfoundland Way Police Station (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**



#### **7.5.2.5. Bath Road (Traffic Urban)**

The Bath Road monitoring site (360382, 171659) was established on the A4 Bath Road to monitor the current traffic-related pollution to assess the effects of a proposed Arena development when completed (Figure 7.29). The site was established in October 2005 to monitor the environmental effects of any changes in traffic flows along the A4. This monitor reflected the quality of the air that is being breathed by the residents of the adjacent residential terrace. This site ceased monitoring in January 2013.



**Figure 7.29: Bristol Bath Road (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**

#### **7.5.2.6. Parson Street School (Traffic Urban)**

The Parson Street School monitoring site (358065, 170586) has been operating since February 1999 and was selected as a roadside site that represents a residential area in which people could be exposed to high concentrations of traffic generated pollution (Figure 7.30) The sample inlet is approximately 1 m from ground level and 3 m from the kerb of Bedminster Road, where traffic queues for the traffic lights at the junction of Parson Street and Bedminster Road. Because idling vehicles are close to the monitor, high concentrations of NO<sub>x</sub> and NO<sub>2</sub> are recorded here. The location of the site is representative of residential exposure in this area.



**Figure 7.30: Bristol Parson Street School (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**

#### **7.5.2.7. Shiner's Garage (Traffic Urban)**

Shiner's Garage monitoring site (361022, 173352) was established in October 2004 to monitor the effect on air quality of the proposed bus showcase route along the A420 (Figure 7.31). The analyser is located a similar distance from the roadside as nearby shops and flats. Measurements from this site are representative of air quality exposure for residents along this section of Church Road. The data from this site was used to determine whether air quality improved following the introduction of a higher quality bus service. This site ceased monitoring in January 2013.



**Figure 7.31: Bristol Shiner's Garage (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**

#### **7.5.2.8. Wells Road (Traffic Urban)**

The site at Wells Road (360904, 170003) was commissioned in June 2003 and measures NO<sub>x</sub>. It is located on the junction of Wells Road and Airport Road and the sample inlet is approximately 1.5 m high and 1 m from the kerbside (Figure 7.32). Some houses nearby are also in similarly close proximity to the road, so this site represents residential exposure to emissions from the road. NO<sub>2</sub> concentrations at the site regularly exceed the annual mean objective but not the hourly mean objective.



**Figure 7.32: Bristol Wells Road (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**

### **7.5.2.9. Rupert Street (Traffic Urban)**

Rupert Street monitoring site (358651, 173145) is located in a cabin on a traffic island in the middle of the street where it monitors emissions from traffic (Figure 7.33). It is also at the end of a "canyon street" and is in a very busy public area. The concentrations of NO<sub>x</sub> and NO<sub>2</sub> here are consistently higher than any other site in the Bristol network. This reflects its location in the centre of a dual carriageway carrying high levels of slow moving traffic with a high proportion of buses. The site is useful for assessing compliance with the hourly mean objective for NO<sub>2</sub> but does not represent exposure for assessment against the annual mean objective. Although classified by the local authority as an Urban Centre site, it is more characteristic of a Traffic site than a Background site so has been reclassified for the purposes of this research as a Traffic Urban site.



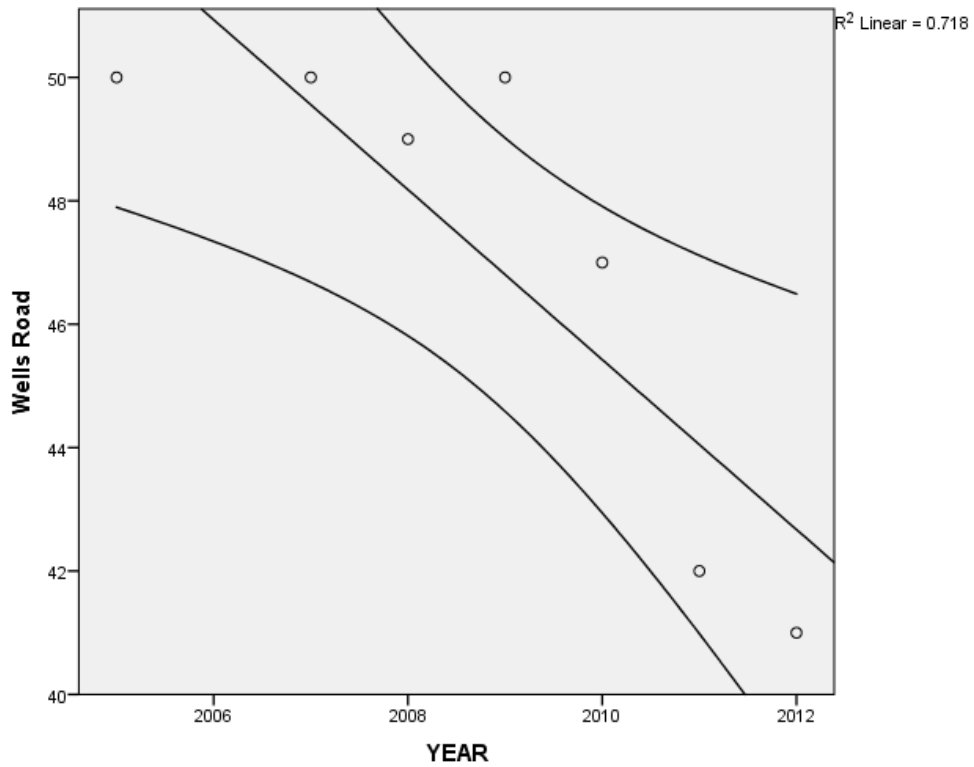
**Figure 7.33: Bristol Rupert Street (Traffic Urban) site (from <http://www.bristol.airqualitydata.com>)**

#### 7.5.2.10. Monitoring data

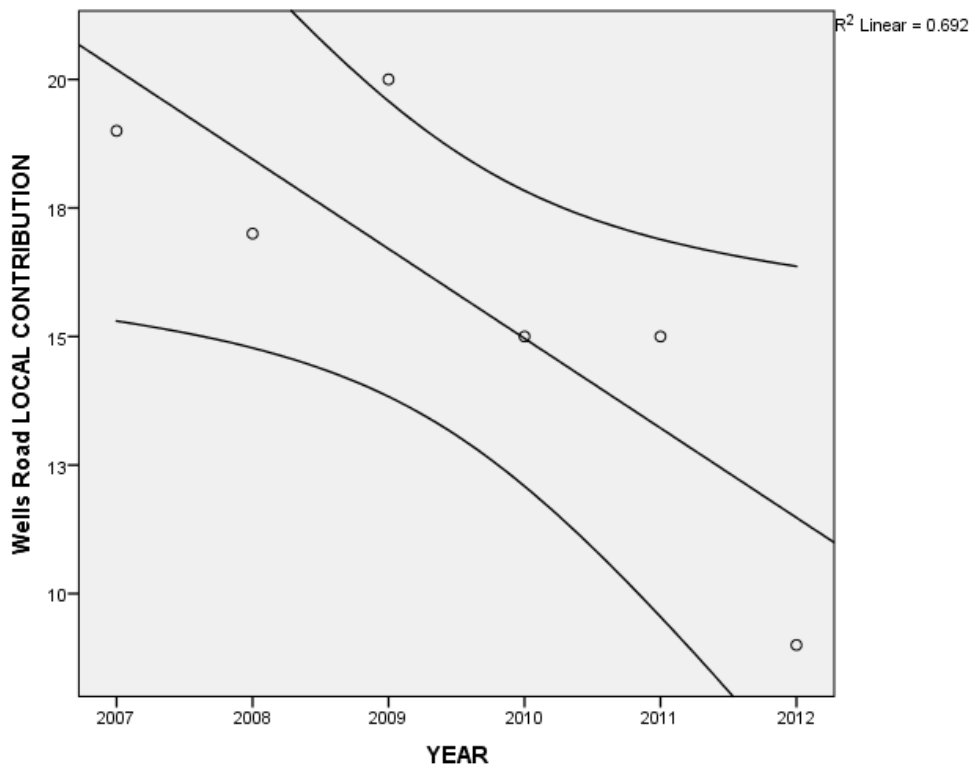
There are two Background Urban sites in Bristol (Bristol St Pauls (AURN) and Brislington Depot (LA AA)) and seven Traffic Urban sites – Rupert Street, although classified by the local authority as an Urban Centre site, is more characteristic of a Traffic Urban than a Background site. The local contribution to roadside NO<sub>2</sub> must therefore be calculated at each Traffic Urban site.

The AURN site, Bristol St Pauls, was only operational from 2007 to 2012, with an average 31 µg/m<sup>3</sup> NO<sub>2</sub> annual mean. The average NO<sub>2</sub> annual mean for the Brislington Depot site is 35 µg/m<sup>3</sup> (Figure 7.19). There is no statistically significant trend at either site at the 95% confidence interval (Appendix 10. Figure 4 and Appendix 10. Figure 5). Both sites are approximately 30 m from the nearest road, though the Brislington Depot site may be more heavily trafficked, which would account for the slightly higher concentrations measured at this location (Figure 7.19). Both sites are within 5 km of all other sites and therefore, according to the siting criteria used for selecting monitoring stations, may be taken as being representative of background concentrations at all locations. Given the potential for the Brislington Depot site to be affected by local traffic sources and the rigour of AURN site QA/QC and reporting, the Bristol St Pauls site was used in the local contribution calculations across all sites to ensure comparability.

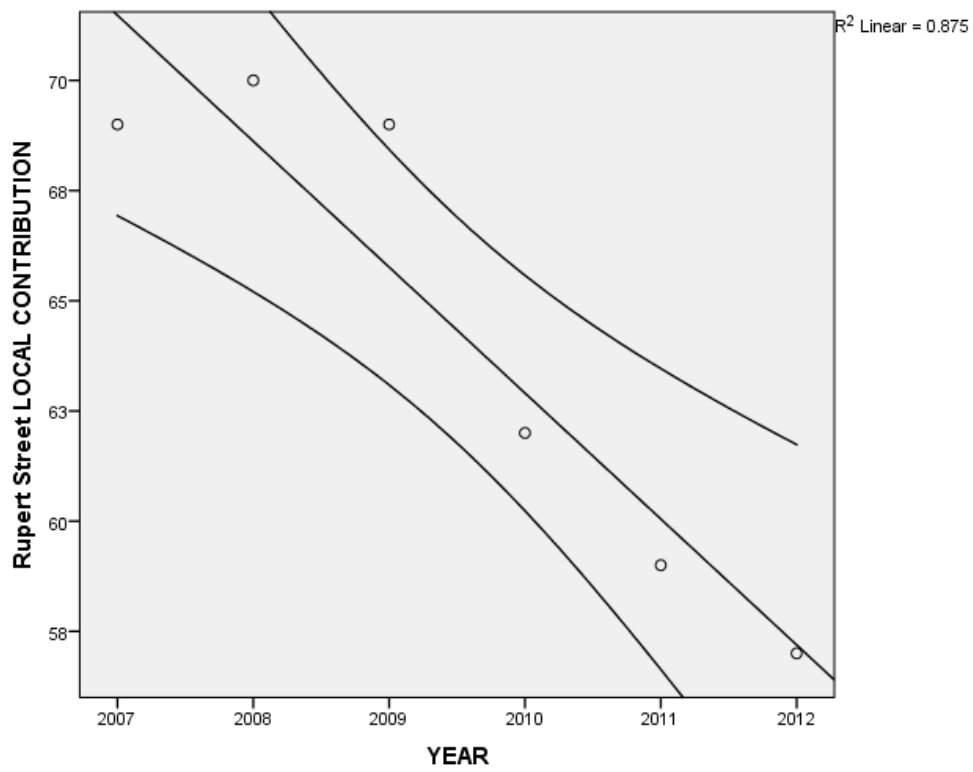
Local contribution can only be calculated for those years with both Traffic Urban and Background Urban monitoring data available. Appendix 10. Figure 6 to Appendix 10. Figure 19 show Traffic Urban and calculated Local Contribution NO<sub>2</sub> for each site, with linear regression trend lines and 95% confidence intervals. Only Wells Road had a statistically significant trend in Traffic Urban NO<sub>2</sub> annual Mean concentrations 2005-2012 (Figure 7.34). Analysis shows that there is a statistically significant negative gradient ( $\hat{\beta} = -1.377$ ) in the data for Wells Road (Traffic Urban) ( $t = -3.572$ ,  $df = 5$ ,  $p = 0.016$ , two-sided) (Table 7.1). This downward trend was also significant in the Wells Road Local Contribution calculated annual mean NO<sub>2</sub> concentrations 2007-2012 (Figure 7.35). Analysis shows that there is a statistically significant negative gradient ( $\hat{\beta} = -1.743$ ) in the data for Wells Road (Local Contribution) ( $t = -2.997$ ,  $df = 4$ ,  $p = 0.040$ , two-sided) (Table 7.1). Rupert Street Local Contribution annual mean NO<sub>2</sub> concentrations showed a strongly statistically significant downward trend (Figure 7.36). Analysis shows that there is a statistically significant negative gradient ( $\hat{\beta} = -2.857$ ) in the data for Rupert Street (Local Contribution) ( $t = -5.283$ ,  $df = 4$ ,  $p = 0.006$ , two-sided) (Table 7.1). No other sites in Bristol showed statistically significant trends.



**Figure 7.34: Bristol Traffic Urban automatic monitoring data 2004-2012 showing Wells Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



**Figure 7.35: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2011 for Wells Road and Bristol St Pauls showing linear regression line and 95% confidence intervals**



**Figure 7.36: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2011 for Rupert Street and Bristol St Pauls showing linear regression line and 95% confidence intervals**



### **7.5.3. Leicester CC (Leicester AQMA)**

There was one Background Urban site (Leicester Centre (AURN)) and eight Traffic Urban sites (Glenhills Way, Abbey Lane, Melton Road, St Matthews Way, Imperial Avenue, Uppingham Road, Vaughan Way and London Road) that were considered to be representative of Leicester AQMA.

#### **7.5.3.1. Leicester Centre (AURN) (Background Urban)**

Leicester Centre AURN monitoring station (458776, 304088) was located within a self-contained, air-conditioned housing located in a pedestrian piazza between eight and eleven-storey council offices (Figure 7.37). It was situated approximately 30 m from the A594, a three lane one-way road which is subject to congestion at peak times. The surrounding area is built up containing commercial premises. This site was discontinued in September 2013 as it did not meet the EU siting criteria as the neighbouring office blocks were considered to be preventing free air movement (Eaton, 2010).

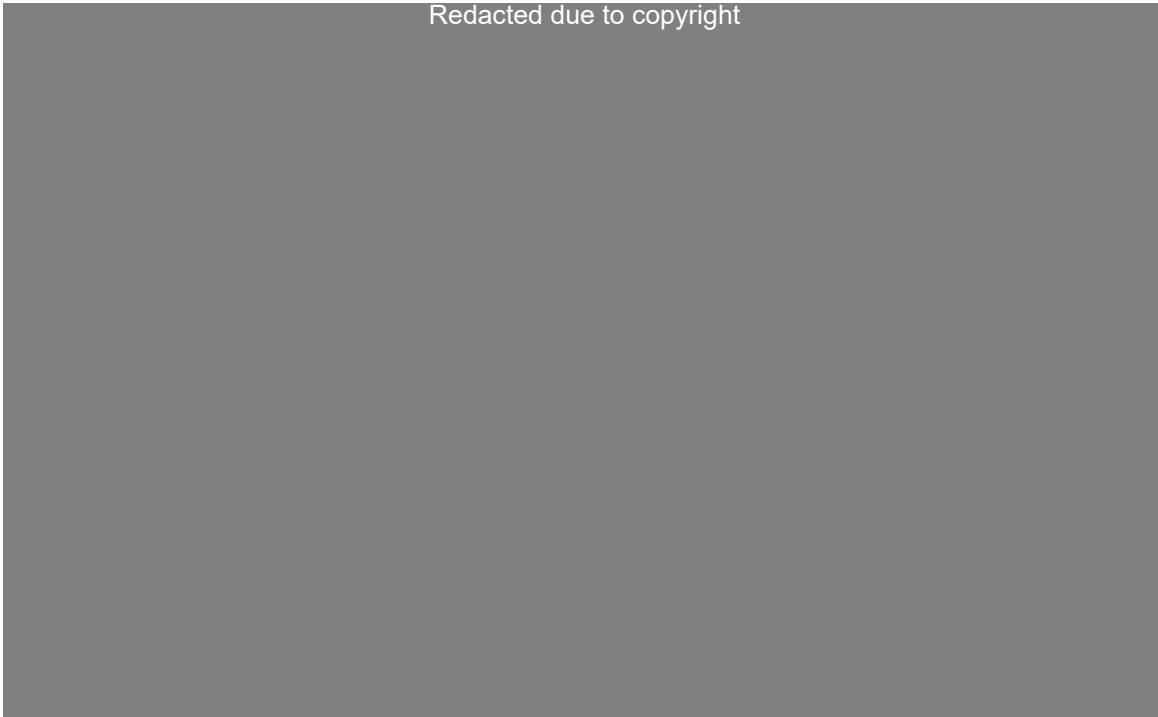
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**Figure 7.37: Leicester Centre AURN (Background Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

### **7.5.3.2. Glenhills Way (Traffic Urban)**

Glenhills Way monitoring site (457083, 300156) is located at a heavily trafficked site with exposure within 11 m, on the junction of Glenhills Way and Lutterworth Road (Figure 7.38). Glenhills Way is part of the southern section of the outer ring road between Saffron Lane and Soar Valley Way. The air quality monitoring station is located at the junction of Aylestone Road, a radial route from the city centre, and the outer ring road.



**Figure 7.38: Leicester Glenhills Way (Traffic Urban) site (captured from Google Maps Street View)**

### **7.5.3.3. Abbey Lane (Traffic Urban)**

Abbey Lane monitoring site (458574, 306885) is located at a heavily trafficked site with immediate exposure at the junction of Abbey Lane and Beaumont Leys Lane (Figure 7.39). The site was installed with support of Leicester City Council Transport Division, to assess proposed traffic schemes. Abbey Lane is one of the main radial routes from the north of Leicester into and out of the city. The air quality monitoring station is located about halfway between the city centre and the outer ring road.



**Figure 7.39: Leicester Abbey Lane (Traffic Urban) site (captured from Google Maps Street View)**

#### **7.5.3.4. Melton Road (Traffic Urban)**

Melton Road monitoring site (459528, 306316) is a heavily trafficked site with immediate exposure near the junction with Loughborough Road. The site was installed with the support of Leicester City Council Transport Division, to assess proposed traffic schemes. Melton Road is one of the main radial routes from the north of Leicester into and out of the city and runs parallel to Abbey Lane. The air quality monitoring station is located about halfway between the city centre and the outer ring road.



**Figure 7.40: Leicester Melton Road (Traffic Urban) site (captured from Google Maps Street View)**

#### **7.5.3.5. St Matthews Way (Traffic Urban)**

St Matthews Way monitoring site (459221, 305036) is located at a heavily trafficked site with exposure within 7 m, on the north side of St Matthews Way, near the junction with Wharf Street North (Figure 7.41). St Matthews Way forms the north east section of the city's inner ring road. The air quality monitoring station is located on St Matthews Way approximately midway between two radial routes namely Melton Road and the A47.



**Figure 7.41: Leicester St Matthews Way (Traffic Urban) site (captured from Google Maps Street View)**

#### **7.5.3.6. Imperial Avenue (Traffic Urban)**

Imperial Avenue monitoring site (457245, 303040) is located at a heavily trafficked site with immediate exposure, on the junction of Narborough Road and Imperial Avenue (Figure 7.42).



**Figure 7.42: Leicester Imperial Avenue (Traffic Urban) site (captured from Google Maps Street View)**

### **7.5.3.7. Uppingham Road (Traffic Urban)**

Uppingham Road monitoring site (461188, 305306) is located at a heavily trafficked site with exposure within 10 m, near the junction with Kitchener Road. Uppingham Road is a major east to west arterial link into the City Centre. It has an important local centre with a range of small general and specialist shops, and an established supermarket. It is a heavily-used bus route with around 20 buses per hour in each direction, but currently suffers from a lack of either on-road, or suitable alternative parallel, cycle route. Uppingham Road is a continuation of the Humberstone Road Quality Bus Corridor (which was due for implementation in 2008/09). The road forms part of the Outer Ring Road in the south-eastern corner of the City.

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**Figure 7.43: Leicester Uppingham Road (Traffic Urban) site (captured from Google Maps Street View)**

#### **7.5.3.8. Vaughan Way (Traffic Urban)**

Vaughan Way monitoring site (458507, 304904) is located at the end of East Bond Street, adjacent to Vaughan Way. It was installed under a Section 106 agreement to assess the impact of the Highcross retail development.

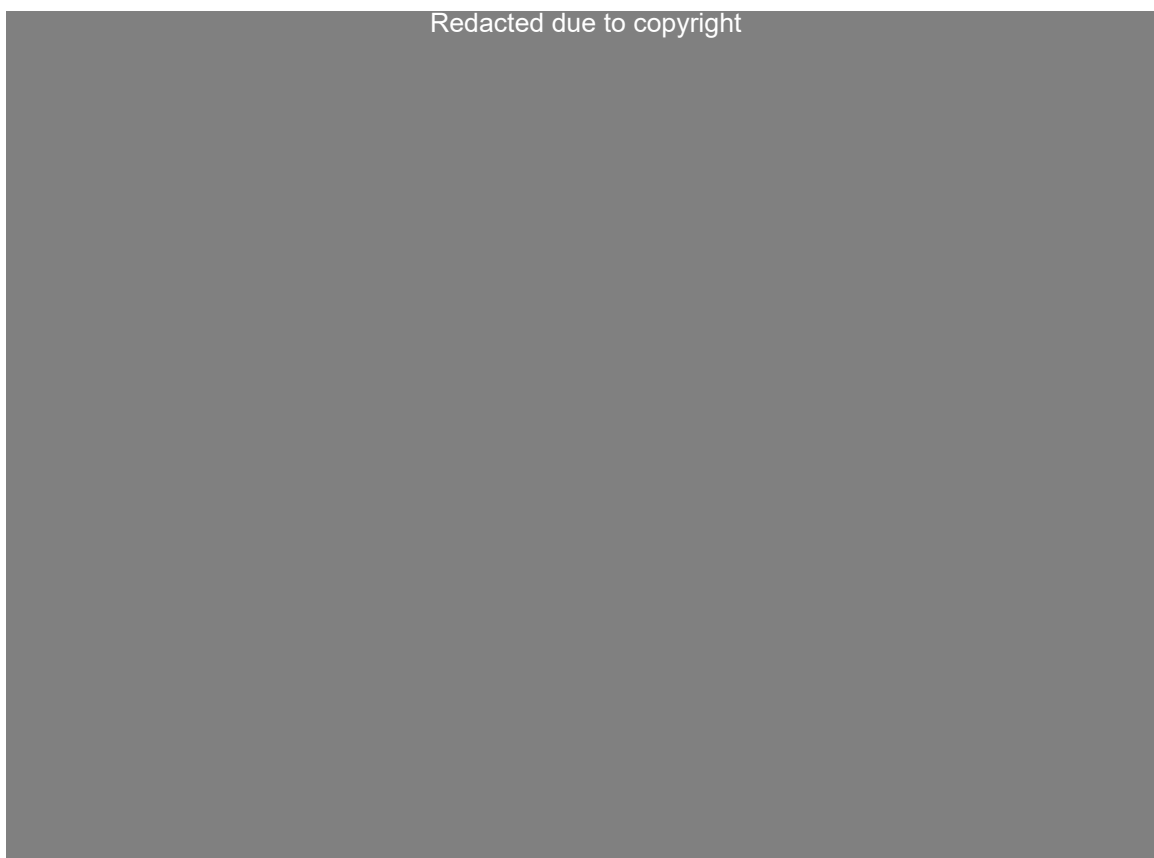


**Figure 7.44: Leicester Vaughan Way (Traffic Urban) site (captured from Google Maps Street View)**



### **7.5.3.9. London Road (Traffic Urban)**

London Road monitoring site (460843, 302059) is located at a heavily trafficked site without exposure, between the junctions of Ratcliffe Road and Shirley Road (Figure 7.45). The site was installed with the support of Leicester City Council Transport Division, to assess proposed traffic schemes.



**Figure 7.45: Leicester London Road (Traffic Urban) site (captured from Google Maps Street View)**

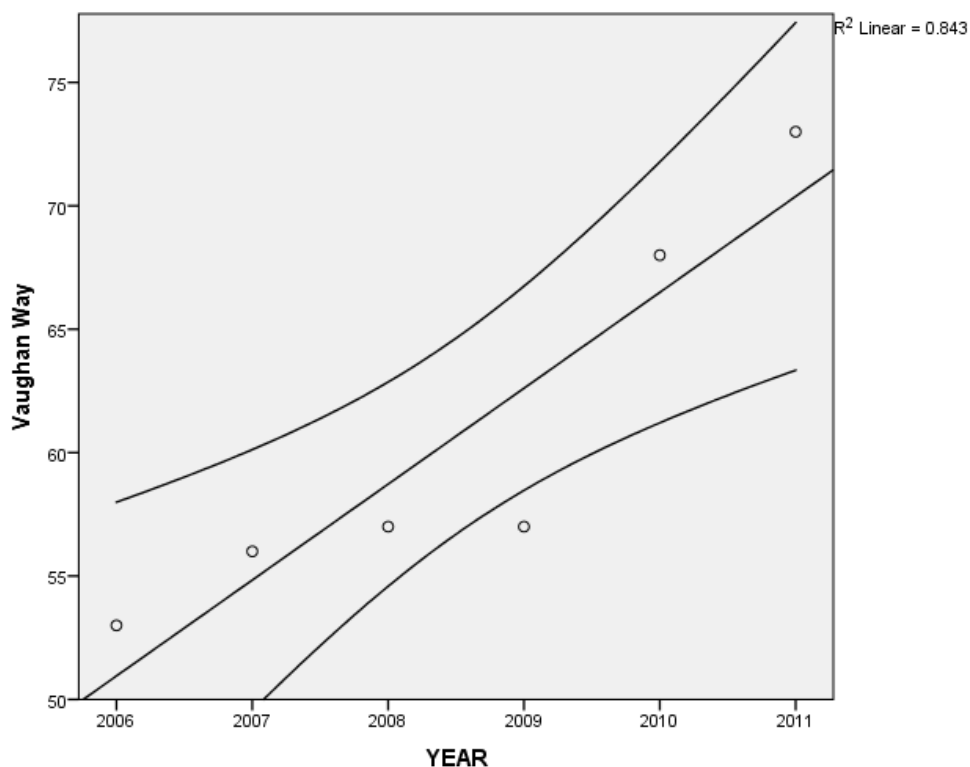
### **7.5.3.10. Monitoring data**

Leicester City Council operated eight Traffic Urban automatic analysers in addition to the Background Urban AURN at Leicester Centre. The Background Urban site is located in a pedestrianised area approximately 30 m from a heavily-trafficked road. Annual mean concentrations at this site are relatively high for a background site (similar to Bristol, but higher than Barnsley or York) at 29-42  $\mu\text{g}/\text{m}^3$  (Appendix 10, Figure 20). No significant trend in annual mean  $\text{NO}_2$  concentrations was recorded for the period. Given the relatively high concentrations at this centrally-located Background Urban site, it may not be considered representative of wider background  $\text{NO}_2$  across the city. This is evident at sites such as Imperial Avenue, London Road and Uppingham Road, where calculated local  $\text{NO}_2$  gave negative concentrations in some

years, i.e. Background concentrations were higher than measured Roadside concentrations (Appendix 10. Figure 25, Appendix 10. Figure 27, Appendix 10. Figure 33). In addition, the Leicester Centre AURN was not deemed to be appropriately sited according to the EU criteria (Eaton, 2010).

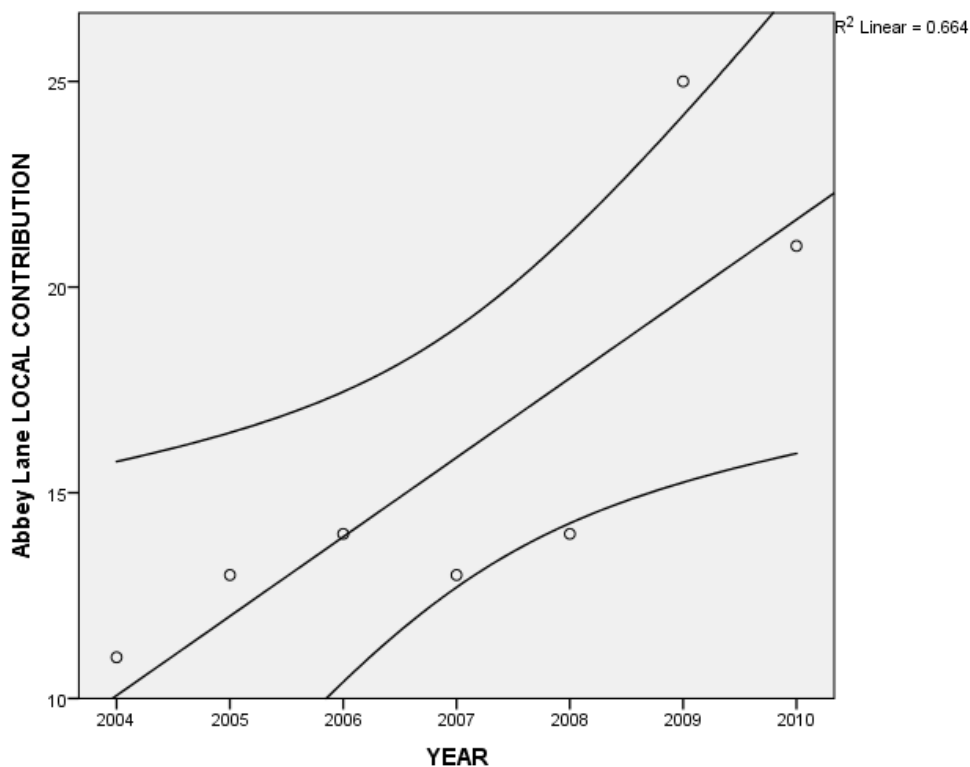
Annual mean Background concentrations were unavailable for 2011 and there were no 2012 concentrations available for any of the Roadside sites. It was therefore not possible to calculate any local NO<sub>2</sub> concentrations after 2010. For two sites (London Road and Vaughan Way) there was also no Roadside data for 2004 or 2005, therefore leaving only five years' data on which to calculate trends in local NO<sub>2</sub> concentrations.

Vaughan Way was the only Traffic Urban site with a statistically significant trend (Figure 7.46). Analysis shows that there is a statistically significant positive gradient ( $\hat{\beta} = 3.886$ ) in the data for Vaughan Way (Traffic Urban) ( $t = 4.639$ ,  $df = 5$ ,  $p = 0.010$ , two-sided) (Table 7.1). This very strong upward trend at the Vaughan Way site suggests that measures to reduce concentrations of NO<sub>2</sub> may not be effective at this location.



**Figure 7.46: Leicester Traffic Urban automatic monitoring data 2006-2011 showing Vaughan Way NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**

Abbey Lane was the only Local Contribution data with a statistically significant trend (Figure 7.47). Analysis shows that there is a statistically significant positive gradient ( $\hat{\beta} = 1.929$ ) in the data for Abbey Lane (Local Contribution) ( $t = 3.143$ ,  $df = 5$ ,  $p = 0.026$ , two-sided) (Table 7.1). Despite the statistical significance, it is difficult to have confidence in the trend at Abbey Lane due to the uncertainty regarding the validity of the Background Urban site, Leicester Centre, which was used in its calculation.



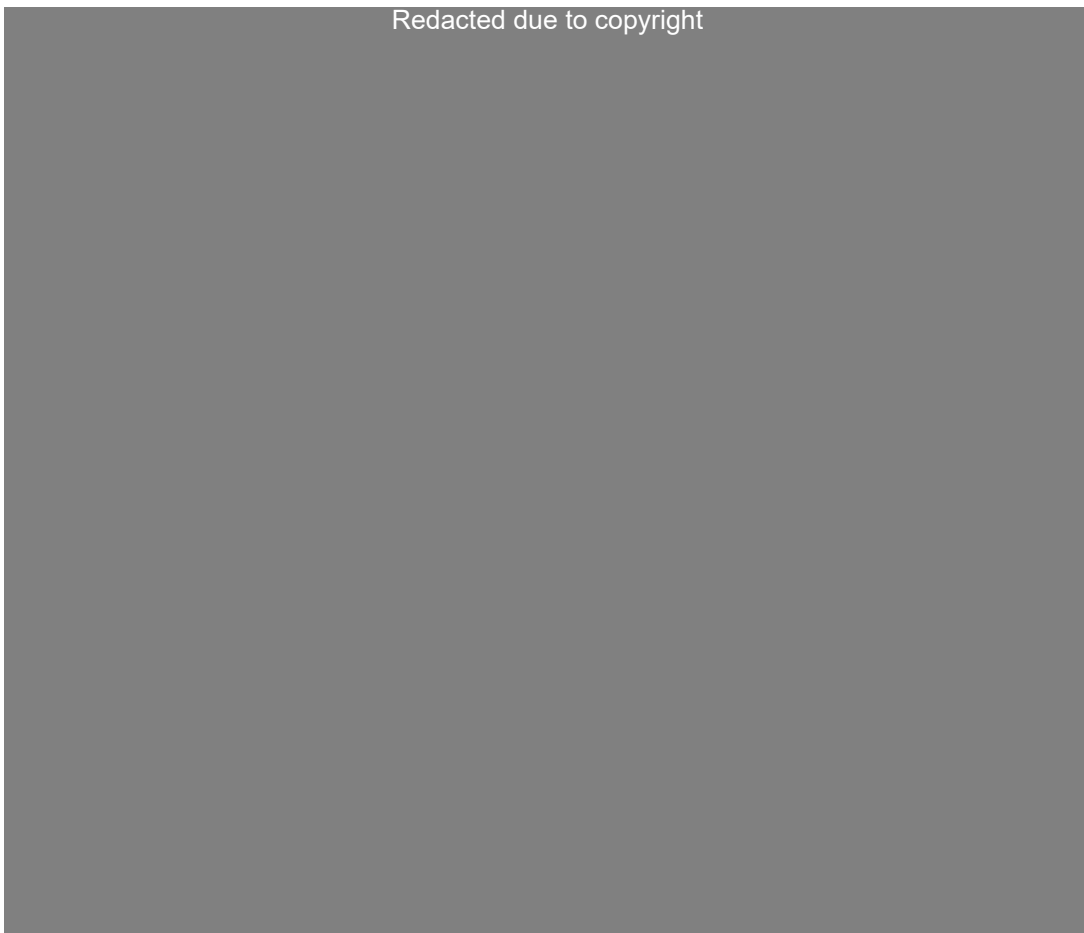
**Figure 7.47: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Abbey Lane and Leicester Centre showing linear regression line and 95% confidence intervals**

#### **7.5.4. Oxford CC (Oxford AQMA)**

There was one Background Urban site (Oxford St Ebbe's (AURN)) and two Traffic Urban sites (Oxford Centre Roadside/St Aldate's (AURN) and High Street (LA)) that were considered representative of the Oxford AQMA.

##### **7.5.4.1. Oxford St Ebbe's (AURN Affiliated) (Background Urban)**

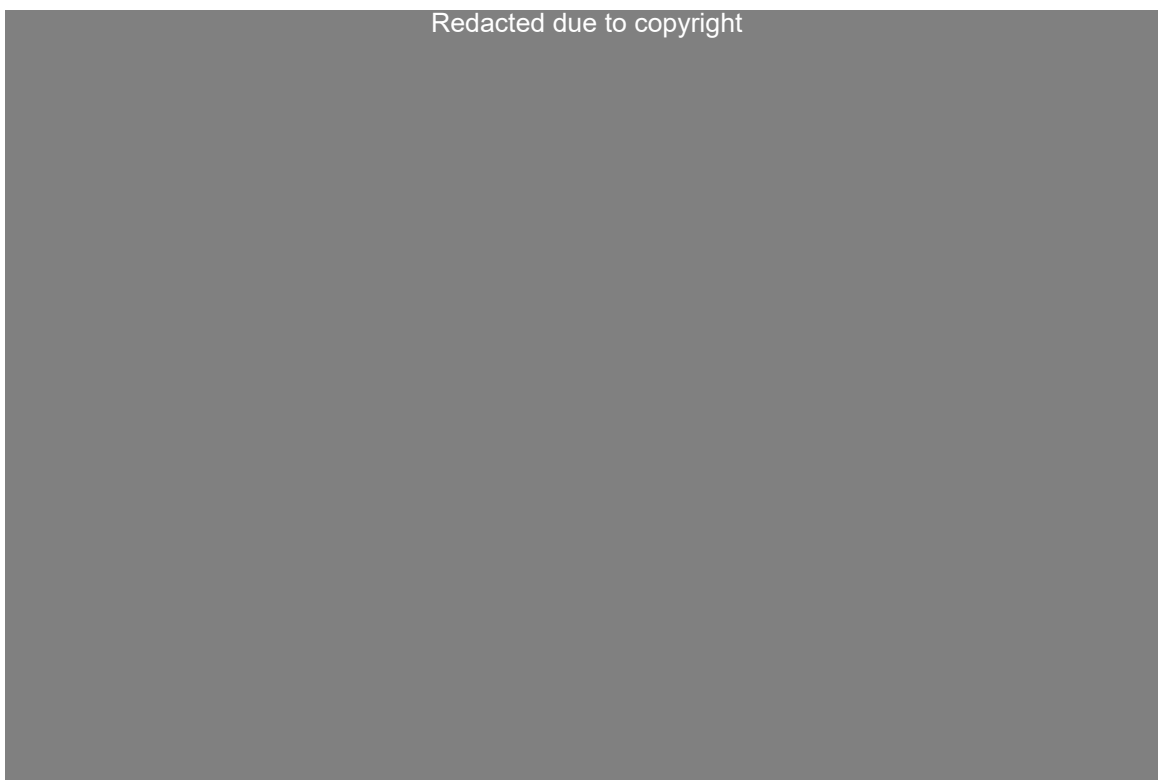
Oxford St Ebbe's AURN monitoring station (451164, 205386) is located within a self-contained, air conditioned housing within the grounds of St Ebbe's School, White House Road (Figure 7.48). The nearest road is a minor road approximately 5 m from the monitoring station. The surrounding area comprises open fields and residential dwellings.



**Figure 7.48: Oxford St Ebbe's AURN (Background Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

**7.5.4.2. Oxford Centre Roadside/St Aldate's (AURN) (Traffic Urban)**

Oxford Centre monitoring station (451347, 206168) is within the basement of the town hall on the A428 St Aldate's, close to the centre of Oxford (Figure 7.49). The surrounding area is a popular location for tourists and comprises urban business and commercial properties.



**Figure 7.49: Oxford Centre AURN/St Aldate's (Traffic Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

#### **7.5.4.3. High Street (Traffic Urban)**

Oxford High Street site (451677, 206272) is located on a busy central street with a high proportion of public service vehicles (Figure 7.50).



**Figure 7.50: Oxford High Street (Traffic Urban) site (captured from Google Maps Street View)**

#### **7.5.4.4. Monitoring data**

Oxford City Council operates one AURN-affiliated Background Urban site (St Ebbe's AUN) and a Roadside site (High Street) in addition to the AURN Roadside site (Oxford Centre Roadside/St Aldate's). Both St Aldate's and High Street had been classified by the local authority as Urban Centre, but were also referred to as Roadside sites. As they are more characteristic of Traffic Urban sites (indeed the AURN site was classified as Roadside by Defra) they were considered as such in this research. Given that there are effectively two Traffic sites and one Background site, local NO<sub>2</sub> concentrations were calculated for High Street and Oxford Centre Roadside/St Aldate's.

There were no significant trends at any of the Oxford sites. At St Ebbe's AUN Background site and High Street Roadside site, annual mean NO<sub>2</sub> concentrations are erratic, while at Oxford Centre Roadside/St Aldate's concentrations fell for the five years to 2009, but steadily increased thereafter. Resurfacing work between July 2009 and May 2010 in High Street was attributed with contributing to congestion and higher concentrations during this period, though local contribution annual mean concentrations do not appear to have fallen subsequently.

### **7.5.5. Sandwell MBC (Great Barr NW, Great Barr South, Great Barr SW)**

There was one Background Urban site (Sandwell West Bromwich (AURN)) and one Traffic Urban site (Wilderness Lane (Great Barr)) that were considered representative of the Great Barr NW, Great Barr South, Great Barr SW AQMAs in Sandwell MBC.

#### **7.5.5.1. Sandwell West Bromwich (AURN) (Background Urban)**

Sandwell West Bromwich AURN monitoring station (400395, 291503) was within a self-contained, air-conditioned housing located on the top (first) floor of an enclosed car park which serves the Council offices. The nearest minor road is Lombard Road, approximately 20 m to the north-west and the nearest main road (West Bromwich High Street) lies about 90 m to the south-west. The manifold inlet height was approximately 8 m above ground level. This location is within the commercial centre of West Bromwich. This site was deemed not to meet the EU siting criteria (Eaton, 2010) and was closed at the end of 2011.

Redacted due to copyright



**Figure 7.51: Sandwell West Bromwich AURN (Background Urban) site (from Defra UK Air website <http://uk-air.defra.gov.uk>)**

### **7.5.5.2. Wilderness Lane (Great Barr) (Traffic Urban)**

Wilderness Lane (Great Barr) (403956, 294855) is an automatic monitor which was installed on Wilderness Lane 50 m north of the M6 in February 2003.

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**Figure 7.52: Sandwell Wilderness Lane (Great Barr) (Traffic Urban) site (captured from Google Maps Street View)**

### **7.5.5.3. Monitoring data**

There was only one Background Urban and one Traffic Urban site in Sandwell that had met the relevant criteria: Sandwell West Bromwich AURN (Background Urban) and Wilderness (Great Barr) (Traffic Urban). The Traffic Urban site is located on a relatively quiet road close to the M6 overpass between Junctions 7 and 8. The site is not representative of relevant exposure but is relatively central to the three Great Barr AQMAs: SW, South and NW. The Background Urban site is an AURN site located almost 5 km from the Traffic Urban monitor and the three relevant AQMAs. The Background site is therefore on the limit of the acceptable distance range to be considered representative of background NO<sub>2</sub> at the Traffic Urban site.

Annual mean Background NO<sub>2</sub> concentrations were available between 2004 and 2011, but annual mean Traffic Urban concentrations were only available until 2010 so local NO<sub>2</sub> concentrations could only be calculated from 2004-2010. There were no significant trends identified for either site or for the calculated local contribution.



### **7.5.6. City of York Council (York AQMA)**

There was one Background Urban site (Bootham) and six Traffic Urban sites (Fishergate, Lawrence Street, Nunnery Lane, Gillygate, Holgate Road and Heworth Green) that were considered to be representative of the York AQMA. All sites were local authority run.

#### **7.5.6.1. Bootham (Background Urban)**

The Bootham Background Urban monitoring station (460022, 452777) is located in the grounds of a hospital close to the city centre (Figure 7.53). The hospital has a residential care unit for the elderly and has within its grounds a cricket pitch and tennis courts. The grounds are accessible by the general public. The presence of the residential care unit makes this a relevant location for the purpose of the long term air quality objectives. People using the outdoor sports facilities and walking in the grounds are exposed for short periods of time meaning that this location is equally relevant for the short term air quality objectives.



**Figure 7.53: York Bootham (Background Urban) site (from <http://www.jorair.co.uk>)**

### **7.5.6.2. Fishergate (Traffic Urban)**

Fishergate monitoring site (460746, 451038) is located to the south east of the city centre, close to where the busy A19 arterial route meets the inner ring road (Figure 7.54). This area experiences severe congestion during rush hour periods and is busy throughout the day. Fishergate is primarily a residential area but also contains a primary school and a number of small shops. The station is located on a large triangular shaped traffic island in the centre of the road.

Redacted due to copyright



**Figure 7.54: York Fishergate (Traffic Urban) site (from <http://www.jorair.co.uk>)**

### **7.5.6.3. Lawrence Street (Traffic Urban)**

Lawrence Street monitoring site (461256, 451340) is located to the east of the city centre, on the busy A1079 that leads towards the A64 outer ring road (Figure 7.55). Due to the traffic lights located at the junction of the A1079 with the inner ring road, Lawrence Street experiences significant queuing throughout much of the day. This area contains a mixture of residential, business and light industrial premises. It is also the main access point for the James Street industrial park. Over the past year there has been a significant amount of redevelopment on Lawrence Street which has introduced a greater proportion of residential premises.



**Figure 7.55: York Lawrence Street (Traffic Urban) site (from <http://www.jorair.co.uk>)**

#### **7.5.6.4. Nunnery Lane (Traffic Urban)**

Nunnery Lane monitoring site (460068, 451199) is located to the south west of the city centre and forms a one-way gyratory system. This area experiences severe congestion during rush hour periods and is busy throughout the day. The south of Nunnery Lane is primarily a residential area with terrace housing located close to the road. The north of Nunnery Lane contains a large school and car park (Figure 7.56).

Redacted due to copyright



**Figure 7.56: York Nunnery Lane (Traffic Urban) site (from <http://www.jorair.co.uk>)**

#### **7.5.6.5. Gillygate (Traffic Urban)**

The Gillygate monitoring station (460147, 452345) is located to the north of the city centre close to where the busy A19 arterial route meets the inner ring road (Figure 7.57). Gillygate is a relatively narrow street with 3 to 5 storey high buildings located along its length. It forms a street canyon within which there is poor dispersion of pollutants. As Gillygate forms part of the busy inner ring road it regularly experiences queuing traffic along its length throughout much of the day. At street level the majority of the premises on Gillygate are occupied by small businesses and shops which have residential flats above. However, there are a number of residential properties at street level on the west side of the street.



**Figure 7.57: York Gillygate (Traffic Urban) site (from <http://www.jorair.co.uk>)**

#### **7.5.6.6. Holgate Road (Traffic Urban)**

Holgate Road monitoring site (459512, 451282) is located to the south west of the city centre close to where the A59 and the A1036 meets the inner ring road (Figure 7.58). Due to traffic lights on the junction of the A59 and the A1036 this part of Holgate Road regularly experiences standing traffic throughout much of the day. Holgate Road is primarily a residential area, but also contains a few small shops and business premises.

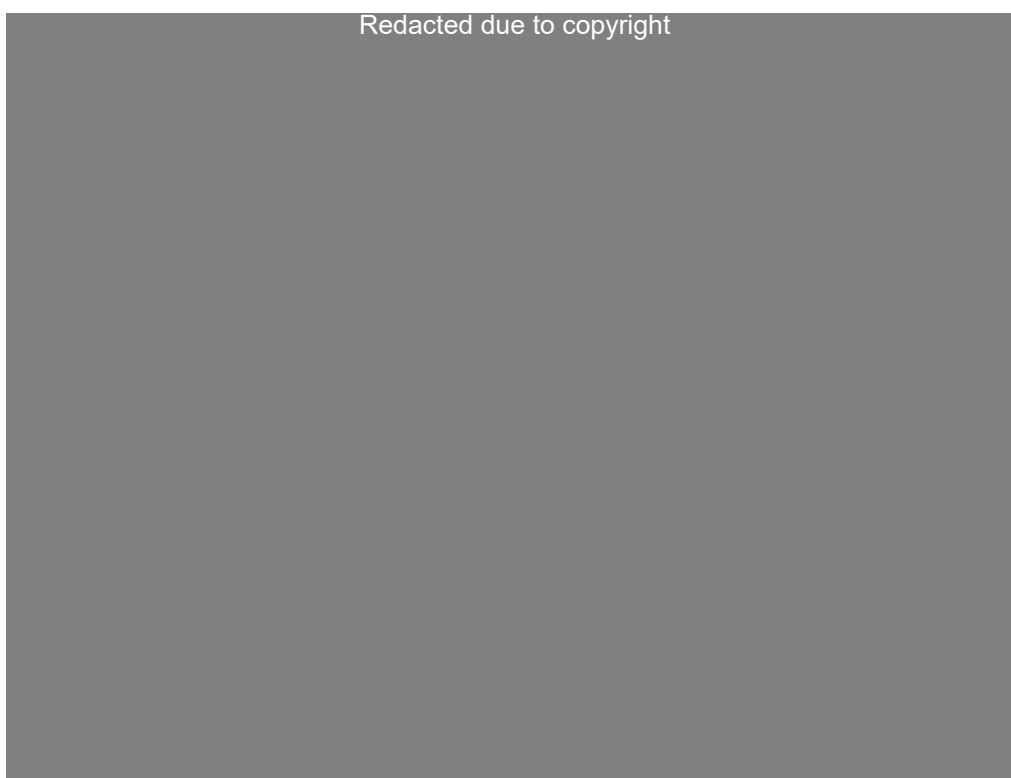
Redacted due to copyright



**Figure 7.58: York Holgate Road (Traffic Urban) site (from <http://www.jorair.co.uk>)**

#### **7.5.6.7. Heworth Green (Traffic Urban)**

The Heworth Green roadside air quality monitoring station (461126, 452602) is located to the north east of the city centre (Figure 7.59). Heworth Green forms the main route between the centre of York and Heworth Village. The monitoring site is located in a primarily residential area and close to a supermarket. This area of the city is undergoing major redevelopment with a number of housing estates proposed in the vicinity of the site.

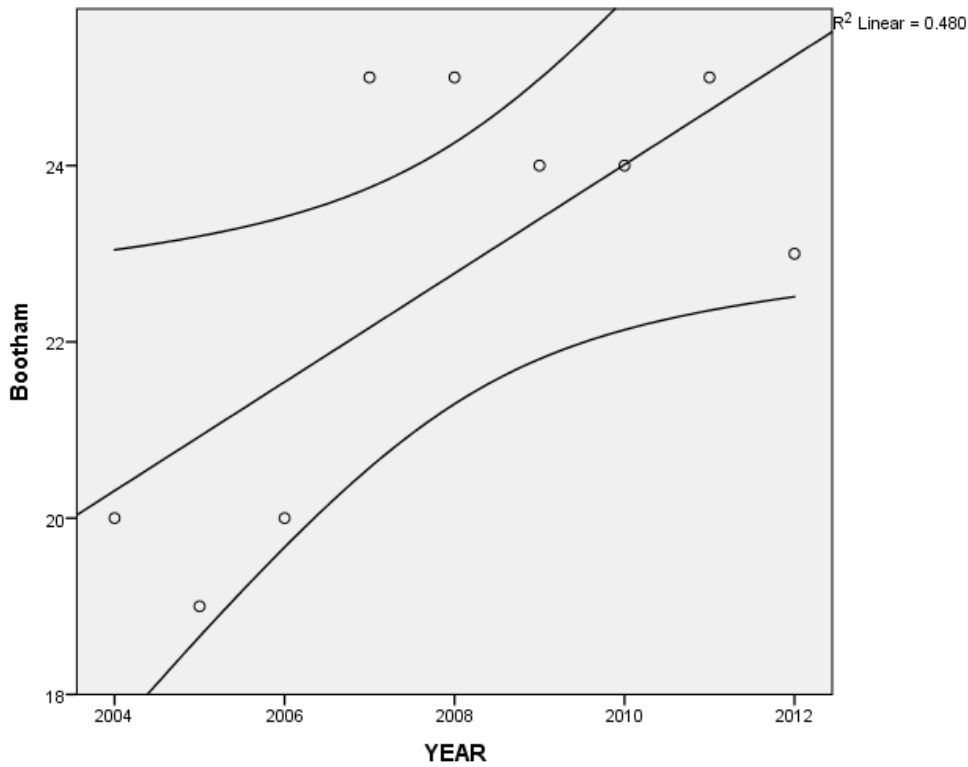


**Figure 7.59: York Heworth Green (Traffic Urban) site (from <http://www.jorair.co.uk>)**

#### **7.5.6.8. Monitoring data**

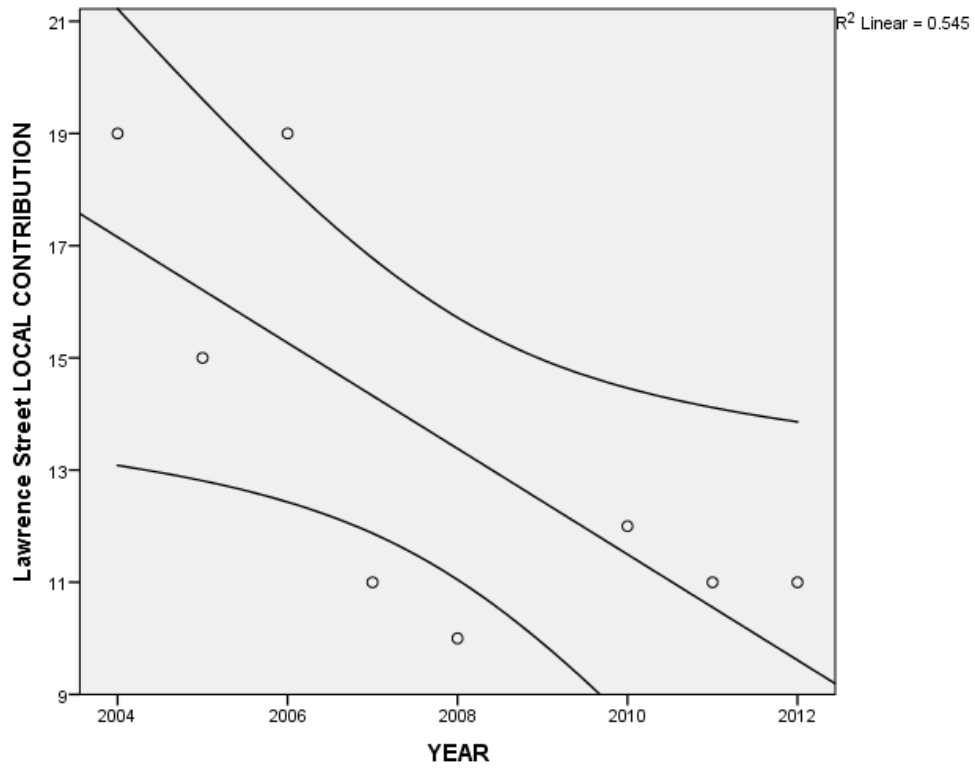
Analysis shows that there is a statistically significant positive gradient ( $\hat{\beta} = 0.617$ ) in the data for Bootham (Background Urban) ( $t = 2.541$ ,  $df = 7$ ,  $p = 0.039$ , two-sided) (Table 7.1). This upward trend is characterised by a step-change in concentrations apparent post-2006 (Figure 7.60). None of the Roadside sites exhibited significant trends, however, although not significant trends for most sites, local concentrations of NO<sub>2</sub> have generally fallen during the nine-year period 2004-2012, though at many the decline has stagnated in recent years and at some has started to rise again. At Gillygate local NO<sub>2</sub> concentrations were rising steadily from 2007-2011, but have fallen sharply in 2012. At Heworth Green, local NO<sub>2</sub> concentrations 2010-2012 are higher than between 2006-2008. The only site with a significant trend in local contribution NO<sub>2</sub>

is Lawrence Street (Figure 7.61). Analysis shows that there is a statistically significant negative gradient ( $\hat{\beta} = -0.943$ ) in the data for Lawrence Street (Local Contribution) ( $t = -2.681$ ,  $df = 6$ ,  $p = 0.037$ , two-sided) (Table 7.1). Total annual mean  $\text{NO}_2$  concentrations at all automatic monitoring sites are now below the  $40 \mu\text{g}/\text{m}^3$  objective, but with the trend in background concentrations rising (Figure 7.60) for those sites with rising local  $\text{NO}_2$  trends there is a danger that there may again be future exceedences.



**Figure 7.60: York Background Urban automatic monitoring data 2004-2012 showing Bootham  $\text{NO}_2$  annual means, linear regression line and 95% confidence intervals**





**Figure 7.61: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Lawrence Street and Bootham showing linear regression line and 95% confidence intervals**

## **7.6. Implementation of AQAP measures**

### **7.6.1. Barnsley MBC (Barnsley AQMA)**

Barnsley MBC (BMBC) completed its draft AQAP in July 2003, which set out 25 measures under the following broad headings:

1. Related Plans/Policies (existing or proposed)
2. Potential Direct Measures to Improve Air Quality within the AQMA
3. General Measures to Reduce Pollution from Transport Sources
4. Targeting of Monitoring within the AQMA and across the Borough
5. General Measures to Reduce Emissions from Industrial and Domestic Sources
6. Development Control and Future Developments
7. General Measures to Promote Air Quality Issues

In October 2004 their first final AQAP was published, which included all of the measures included in the draft AQAP except the original Measure 5 (BMBC will explore the feasibility of the use of variable messaging/traffic management schemes with the Highways Agency by the end of April 2005) which was subsumed within an amended Measure 4 (BMBC will liaise with the Highways Agency and encourage their active consideration of measures to reduce emissions from the M1 motorway by the end of April 2005). An additional two measures, suggested by Defra in the draft AQAP consultation, were added under heading 3 (General Measures to Reduce Pollution from Transport Sources):

- Measure no. 25 – BMBC will explore methods of encouraging the uptake of alternative fuels within the Borough by the end of April 2006.
- Measure no. 26 – BMBC will explore methods of encouraging the conversion of older vehicle types to clean alternatives by the end of April 2006.

Many of the measures in these two AQAPs were rather general with only two targeted at the AQMA itself. These specific measures were aimed at working with the Highways Agency given their responsibility for the M1 traffic, which was the source of exceedences in this AQMA. Barnsley MBC discussed a number of specific options with the Highways Agency and ranked them according to their likely impact, cost effectiveness and feasibility (Table 7.2).

**Table 7.2: AQMA specific measures discussed with the Highways Agency (from Barnsley MBC's AQAP)**

Action	Direct AQMA Options	Cost Effectiveness	Organisation Responsible	Positive Effect on People in AQMA	Positive effect on people in Borough	Date to be achieved	AQ Improvement	Other Positive Impacts	Rank
Option 1	Motorway speed restrictions	**	Highway Agency	***	*	HA would have to implement	Most effective method	Possible reductions in noise + fuel consumption	2
Option 2	Compulsory purchase	*	BMBC	*	*	Limited scale as part of Dodworth By-pass	Removes Exposure	N/A	5
Option 3	Reduction of general background levels	*	National Measures	*	*	Unlikely to be implemented before 2005	Depends on extent of measures	N/A	8
Option 4	Reduction in traffic volumes	*	BMBC/ Highways Agency	**	**	Unlikely to be achieved before 2005	Substantial decreases needed to give positive effect	Possible noise reduction	7
Option 5	Vehicle emission testing	*	SYVET partnership	*	*	2003/4	Minimal	Raises awareness of the issue	4
Option 6	Variable messaging/ traffic management	**	BMBC/ Highways Agency	**	**	HA would have to implement	Low	Improved journey times	3
Option 7	Introduction of tolls to reduce traffic	*	Highways Agency	**	*	Unlikely before 2011	Dependent on traffic reduction achieved	Possible noise reduction	6
Option 8	Dodworth By-pass	***	BMBC	***	**	2006/7	Improvement in air quality	Reduction in noise	1

The Highways Agency estimated that under a “do minimum” scenario, the annual mean NO<sub>2</sub> objective would be achieved by 2007; this anticipated timescale affected the cost-effectiveness estimations made by the Highways Agency which then determined the feasibility of the options under consideration. The Dodworth By-pass (Option 8 and Measure 5) was implemented in 2006/7, but no other options were introduced. Barnsley MBC continued to work with the Highways Agency, mainly via regional air quality groups, as concentrations were not achieved by the objective deadline or the Highways Agency predicted date of 2007. Latterly Barnsley MBC had reported working with the Highways Agency to develop two area-based travel plans at J36 and J37 of the M1, though no updates were provided in the 2011 or 2012 Progress Reports.

In 2005/6, the AQAP was integrated into Barnsley MBC's LTP2. This introduced a number of new measures which were added to a revised AQAP in 2010. In total, the revised AQAP included 22 measures, 50% of which were retained from the 2004 AQAP.

In total there were six measures from the October 2004 AQAP that had been implemented by 2012:

- Measure No.1: BMBC have produced revised policy on pollution, including air pollution, which has been published in the new deposit draft LDF during summer 2004 for consultation.
- Measure No.3: BMBC will ensure that this Action Plan is aligned with the LTP.
- Measure No.5: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07.
- Measure No.7: BMBC has taken part in the South Yorkshire Vehicle Emissions Testing Partnership in order to raise awareness of pollution from vehicles.
- Measure No.8: As part of the SYVET project, BMBC have undertaken 3 days formal emissions testing and 3 days informal emissions testing within the borough. This work was completed during 2003.
- Measure No.24: BMBC will produce a web site for the provision of air quality information, by the end of December 2004.

A further seven were either abandoned or ‘presumed on-going but no longer reported’:

- Measure No.2: BMBC will continue to attend and take an active part in the South Yorkshire Integrated Transport Group (Air Quality and Environment Sub-group) and its work.

- Measure No.4: BMBC will liaise with the Highways Agency and encourage their active consideration of measures to reduce emissions from the M1 motorway by the end of April 2005.
- Measure No.13: BMBC will produce a written monitoring strategy for the borough by the end of December 2005.
- Measure No.18: BMBC will continue to encourage composting of waste rather than burning, by publicity and the provision of discounted cost composting units.
- Measure No.19: BMBC will investigate the feasibility of continuing with home insulation schemes, and will continue to work in partnership with the South Yorkshire Energy Efficiency Advice Centre.
- Measure No.21: BMBC will produce Supplementary Planning Guidance for developers as to when an air quality assessment may be required, and what information may be needed, by the end of December 2004.
- Measure No.22: BMBC will produce Supplementary Planning Guidance as to acceptable development within the AQMA, and requirements on developers by the end of December 2004.

Of the newly added measures in the 2010 revised AQAP, three had been completed by 2012:

- Barnsley Statutory Quality Partnership Scheme (Bus Partnership)
- Barnsley Intelligent Transport System
- Care4Air

This left a remaining 18 measures that were on-going and actively reported as at 2012. Details of all measures from the three AQAPs and their annual reported progress are presented in Appendix 11. Table 1.

Of the nine completed measures, only one (Measure No.5: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07) was reported by Barnsley MBC as contributing specifically to a reduction in NO<sub>2</sub> concentrations, with monitored diffusion tube concentrations in AQMA 2B consistently below the annual mean objective since 2007, leading to a revocation being sought following a Detailed Assessment in 2011. Although no AQMA specific measures had been implemented by the Highways Agency or Barnsley MBC, diffusion tube monitoring in AQMA 1 (M1) also reported achievement of the annual mean at all sites in 2010 and 2011. No revocation was yet being sought for this AQMA according to the

2012 USA and Progress Reports due to the absence of any apparent causal implementation.

#### **7.6.1.1. Relationship between AQAP and monitoring data**

The only measure that is specifically related to AQMA 2A is 'Barnsley Intelligent Transport Systems', with the alteration of the MOVA (Microprocessor Optimised Vehicle Actuation) and SCOOT (Split Cycle and Offset Optimisation Technique) traffic signal controls at the A628 Dodworth Road / Summer Lane / Broadway junction (AQMA 2A) so that MOVA operates at off-peak, whilst SCOOT operates during more busy periods. This measure was only reported as implemented in the 2010 AQAP, however, this may have contributed to the reduction in local source contributions in the last two years' reported data.

#### **7.6.2. Bristol CC (Bristol AQMA)**

The Bristol Local Transport Plan (LTP) was submitted in July 2000 and included a Local Air Quality Strategy as an Appendix and a draft framework for the AQAP in anticipation of the AQMAs that were subsequently declared in May 2001. The AQAP (published in April 2004) considered 56 measures, including six that were not considered cost effective as an air quality measure, 23 that were considered to be adequately covered in the LTP or other policies and 27 LTP 'top-up' or new measures. While some of the 23 LTP measures were reported in the LTP Annual Progress Reports, many were not explicit, e.g. 'Parking information', and others, e.g. 'Powered two-wheelers' were included in the Joint LTP (JLTP2) 2006/7-2010/11.

In addition to the 27 measures initially included in the 2004 AQAP (two with sub-parts), a further measure (Bus NO<sub>x</sub> emissions Reduction) was added in 2012 following receipt of £60,000 funding from DEFRA to reconfigure the engine management software on Euro IV buses to bring them up to Euro V standard.

Of the 28 measures only one (14 M32 Management) was considered complete by 2013 following introduction of a bus lane and speed limit reduction through J3. A further eight measures were not implemented, either due to a lack of funding, failing feasibility or cost-effectiveness tests, or were just no longer reported:

- 17 Vehicle maintenance- Roadside Emissions Testing
- 18 Encouragement of more efficient vehicles.
- 20 Advice / incentives for 'cleaning up' large vehicles
- 21 Retrofitting Smaller Vehicles
- 22 Scrappage Incentives

- 24 Promote and assist freight emissions agreements
- 26 Road User Charging (RUC)
- 27 Clear Zone

21 (sub-)measures were either on-going or on-going under other measures:

- 1 Information & Awareness Initiatives
- 2 Travel Plans
- 3 Safer Routes to School
- 4 Shorter Journeys (including Individualised Travel Marketing)
- 5a Walking
- 5b Cycling Facilities
- 6 Car Clubs
- 7 Reallocation of Road (Bus Priority measures )
- 8 Improved enforcement of existing speed limits
- 9 Area-based speed reduction (20 mph zones in residential areas )
- 10 Intelligent traffic signals (Traffic Urban Management & Control -UTMC)
- 11 Traffic management at pollution hot spots
- 12 Parking Enforcement & Management of Delivery Times
- 13a Stronger enforcement of current motorway speed limits
- 13b Reduced Motorway speed limits in AQMAs
- 15 Freight trans-shipment centres
- 16 Reduce emissions from poorly driven vehicles
- 19 Promote / pilot alternative vehicles / fuels.
- 23 Bus Emissions Regulation (emissions standards in contracts)
- 25 Low Emission Zone ( LEZ) Study Possible Scheme
- Bus NOx emissions Reduction

Amongst the measures that were considered to be on-going, there had been a good deal of progress made. For example, take-up of Travel Plans by 96% of LEAs in the AQMA; delivery of £22 million Cycling City Project; establishment of a Freight Consolidation Centre Scheme serving Bristol and Bath; and the introduction of an Enhanced Traffic Control Centre. There were also a number of site-specific measures implemented, including Showcase Bus Routes on the A420 corridor (completed 2007), A370 GBBN route, A432 Fishponds Road, A4018 and A4 Bath Road corridors (completed March 2012).

Progress with all of Bristol CC's measures is presented in Appendix 11. Table 2.

### **7.6.2.1. Relationship between AQAP and monitoring data**

The Newfoundland Road Police Station site was initiated to measure the effect of the Cabot Circus development, though sited at the end of the M32 as it also subject to changes in traffic emissions relating to the M32 Management. Cabot Circus was completed in 2008 and the bus lane and speed restrictions were introduced to the southern end of the M32 in 2009. Marginally higher concentrations of local NO<sub>2</sub> were recorded in 2009, but in subsequent years roadside concentrations have fallen, reversing a steady increase in concentrations to that point.

Monitoring at Bath Road was intended to assess the impact of a proposed 10,000 seat multi-purpose indoor arena for sports, music conferences and other events and in part as a mixed-use development providing a leisure and entertainment destination. This proposal was subsequently withdrawn. Road and junction bus prioritisation improvements as part of the Greater Bristol Bus Network (GBBN) scheme were completed on the A4 Bath Road corridor in 2012. Local concentrations of NO<sub>2</sub> have fallen markedly in 2012 following an upward trend until this date. Concentrations at Bath Road were below the 40 µg/m<sup>3</sup> objective in 2011 and 2012 and this monitor has now been discontinued.

Parson Street School exhibited slightly increasing local concentrations of NO<sub>2</sub>, until 2012 when concentrations dropped considerably. This may be in part due to proposed GBBN changes to the Parson Street Gyratory which were completed in March 2012.

Wells Road was also subject to improvements under the GBBN scheme which were also completed in March 2012. The Wells Road site showed a significant downward trend ( $\hat{\beta} = -1.743$ ,  $t = -2.997$ ,  $df = 4$ ,  $p = 0.040$ , two-sided) with markedly reduced concentrations of local NO<sub>2</sub> since 2010, and lower concentrations again in 2012. Total Roadside concentrations at this site are now just above the 40 µg/m<sup>3</sup> objective.

GBBN corridor works were also completed on the A420 corridor in 2007. The Shiner's Garage site was established to determine the impact of this bus showcase route. Local NO<sub>2</sub> concentrations steadily increased since 2007, however lower concentrations were recorded in 2012. Total Roadside concentrations are just above the 40 µg/m<sup>3</sup> objective, but the site was discontinued in January 2013.

The most significant downward trend was found at Rupert Street, which has shown a steady reduction in local NO<sub>2</sub> since 2008 ( $\hat{\beta} = -2.857$ ,  $t = -5.283$ ,  $df = 4$ ,  $p = 0.006$ , two-sided). Though it is difficult to identify any specific measure that may have had this effect, the Enhanced Traffic Control Centre, which was operational from September



2008, may have helped improve traffic flows and reduce congestion. There may also have been a knock-on contribution from the M32 Management giving a similar effect from 2009.

No significant trend was identified for Bristol Old Market; with only four measurements available on which to calculate a trend in local NO<sub>2</sub> concentrations (2007-2010), concentrations fluctuated between 30 µg/m<sup>3</sup> and 33 µg/m<sup>3</sup>. Bristol Old Market is situated close to the bottom of the A420 but, like Shiner's Garage located further to the east on this route, there has been no significant improvement in local NO<sub>2</sub> at this site. The site was disaffiliated from the AURN network in August 2012 and was discontinued from January 2013. Given the annual mean objective exceedences at both Bristol Old Market and Shiner's Garage it is unfortunate that these sites have been discontinued.

### **7.6.3. Leicester CC (Leicester AQMA)**

Leicester City Council initially prepared an interim AQAP in May 2004 setting out how they were going to develop the AQAP1 that was subsequently published complete with Actions in September 2004. The AQAP1 included 45 Actions across five categories:

- Emissions Management
- Information and Education
- Land Use Planning
- Managing the Highway Network
- Promotion and Provision of Alternatives

Of these, 34 Actions were brought into the County Council's LTP2 in 2005. The 11 that were dropped included:

- Target house movers/buyers
- Mobility management strategy
- Targeting short journeys
- Education of Officers/Members
- Increase officer/member awareness
- Tree planting
- Pedestrian and cycle priority
- Parking information (VMS)
- County and Regional co-ordination
- School 'walking buses'
- School 'yellow bus' scheme

An additional eight Actions were added to the LTP2 AQAP to give 42 in total:

- Impact of development on transport system / Parking provision
- Management of congestion from road works and events
- Junction improvements
- Signalling improvements
- Improved bus facilities and circulation
- Commissioning additional bus
- Off bus ticketing
- Quality bus contracts

Progress on the Actions in the LTP2 AQAP was reported in the 2006-08 LTP Progress Report. A further LTP Progress Report was also published in 2009, but progress on the AQAP Actions was not included in the published document. In 2011, the LTP3 was published with 37 of the Actions from the LTP2 AQAP integrated; again, no progress on the Actions was reported. The five Actions that were omitted from the LTP3 AQAP were:

- Input to Replacement Local Plan
- Input to LRC / SPG briefs
- Improved Development Control procedures for dealing with development in AQMA
- Impact of development on transport system / Parking provision
- Quality bus contracts

Only the Quality Bus Contracts were explicitly considered and omitted; the remaining Actions were simply no longer reported. Given the paucity of progress reporting on the AQAPs it is difficult to say what if any Actions have been implemented. There were no reported Actions completed; any that were taken into the LTP3 AQAP were considered to be on-going. Two measures that had been written-off at the LTP2 stage (but included in the document) were a Low Emission Zone and Electric/guided buses and trams. These and other measures (Workplace Parking Levy, Road Pricing, Quality Bus Contracts and a Southern Relief Road) had been considered as having the potential to reduce NO<sub>2</sub> concentrations at some of the worst monitoring sites, but were not considered feasible or cost-effective enough to be included in the LTP2. Following consultations and remodelling the LEZ and Trams were being reconsidered in LTP3. All Actions and reported progress are presented in Appendix 11. Table 3.

### **7.6.3.1. Relationship between AQAP and monitoring data**

It is difficult to determine any relationship between the trends in local NO<sub>2</sub> concentrations and measures that have been implemented in the AQAP, as there is no clear evidence that any AQAP measures have been implemented in Leicester. Alternatively, an absence of implemented measures may account for the significant upward trends in concentrations at Vaughan Way and Abbey Lane (local contribution) and only marginal improvements at most other sites.

### **7.6.4. Oxford CC (Oxford AQMA)**

Oxford City Council produced its first draft AQAP in July 2005, which was followed by the final AQAP1 in April 2006 and simultaneously integrated into Oxfordshire County Council's LTP2. The draft AQAP set out 18 separate Actions for consideration, of which 13 were included in the final AQAP1. The five that were omitted include:

- Car Clubs
- High Volume Occupancy
- Scrappage schemes
- Retro-fitting
- Cleaner Fuels

An additional 14 Actions were included in the final AQAP1 to give 31 in total (some Actions were split). During the period of LTP2 (2006-2011), three of the Actions were implemented:

- Statutory Engine Switch-Off (March 2008)
- Bus Quality Partnership:
  - Cross-operator Ticketing (July 2011)
- Bus Gate Enforcement (February 2007)

In July 2013, Oxford City Council drafted a second AQAP for integration into LTP3, following declaration of the whole city as an AQMA for the NO<sub>2</sub> annual mean objective. In this draft AQAP2 the council introduced a series of new measures under five key themes:

1. Reducing freight emissions
2. A city-wide sustainable travel strategy
3. Support for the uptake of low and zero emission vehicles
4. Planning for sustainable transport
5. Managing the Council's transport emissions

Together with these new measures, a further five Actions were considered ongoing from AQAP1:

- Low Emission Zone
- Review of commercial delivery times
  - Freight Quality Partnership
- Bus Quality Partnership.
  - Advanced bus ticketing
- Cycling and walking
  - High Street including pedestrian and safety measures
  - Cycle network improvements including HAMATS programme
  - Fairfax Road cycle link
  - Marston Road cycle improvements
  - Thames Towpath pedestrian/cycle Link
  - The Plain Roundabout cycle safety improvements
- Cleaner Fuels

These included the implementation of a bus Low Emission Zone, which although agreed in 2009, was due to come into force in 2014.

Progress was not reported on any of the remaining Actions.

#### **7.6.4.1. Relationship between AQAP and monitoring data**

Recorded progress on AQAP Actions is presented in Appendix 11. Table 4. Of the three AQAP Actions that were completed, only two of these were implemented during the monitoring period:

- Bus Gate Enforcement (February 2007)
- Statutory Engine Switch-Off (March 2008)

The Bus Gate Enforcement applied to High Street and was reported to have resulted in a 25% decrease in all traffic (including buses), a 60% decrease in cars and a 35% decrease in goods vehicles from 2006 to 2007. Monitoring data for High Street however, appear to indicate an increase in local NO<sub>2</sub> since the implementation of the Bus Gate Enforcement. Similarly, Statutory Engine Switch-Off does not appear to have had any positive long-term effect on local NO<sub>2</sub> with reduced concentrations in 2009 followed by higher concentrations in 2010 and 2011 at both sites. There are a number of longer-term measures that are being undertaken as reported above, but none appear to have been able to adequately reduce local NO<sub>2</sub> concentrations. The effect of

the bus LEZ implementation in 2014 remains to be seen, but Oxford City Council has estimated a potential 68% reduction in NOx emissions from the implementation of this measure alone.

#### **7.6.5. Sandwell MBC (Great Barr NW, Great Barr South, Great Barr SW)**

Sandwell MBC produced an interim draft AQAP in February 2005 which included 21 Actions: four of which were specific to the six AQMAs declared at the time, and the remainder generic Actions for the whole borough. In June 2007 a new draft AQAP was published for consultation to take account of additional exceedences and the declaration of the whole borough as an AQMA. The new AQAP include 23 site-specific Actions and 29 broader measures. This was further updated in September 2009 as the final AQAP with the addition of a further generic Action (Appendix 11. Table 5).

AQAP Progress Reports were published in 2010 and 2011 providing updates on the measures up to 2010. By 2010, 12 of the 53 Actions had been completed (ten of which were site-specific):

- Oldbury Ringway/Birmingham Road (A457), Oldbury
  - Red route treatment - Red Route treatment including the control of parking which would ease congestion (predicted 10% reduction) but there is no obvious place to displace residential parking – Completed October 2010
- Dudley Road East/Roway Lane, Oldbury
  - Red route improvements – Completed 2011
- M5 J1-J2, Oldbury & West Bromwich & M6 J7-J8/M5, Great Barr & Yew Tree
  - Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week – Completed 2006
  - An improved system of contingency planning for the motorway network has been implemented to improve traffic flows – Completed 2006
  - Evaluate the suitability of active traffic management to improve traffic flows on the M6 – Completed 2011
- Newton Road/Birmingham Road (A34), Great Barr
  - Route 51 improvements – a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards – Completed 2008

- Bearwood Road, Smethwick
  - Bus Showcase – Completed 2009
  - Red route along Hagley Road – Completed 2009
- Oldbury Road / Birmingham Road, Blackheath
  - Blackheath Bypass was completed in 2006, the council will implement traffic management scheme to maximise the use of the bypass. As a result of the bypass and Traffic Management proposals a reduction of 40% may be achieved – Completed 2009
- All Saints Way / Newton Road, West Bromwich
  - Red Route (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions) – Completed 2009
- Improving the Road Network to Reduce Congestion
  - Owen Street crossing – Completed 2009
  - Cradley Heath Bypass – Completed 2008

Of the 53 Actions, 22 were not implemented by 2010:

- The council will consider the possible relocation of existing residential properties
- A link is planned between the M54 and the M6 / M6 Toll this will relieve congestion on the M6 Junction 8 to 10A.
- Future Metro Phase 2 – Varsity North
- Photocatalytic Paving – currently suspended due to poor results in the trial carried out by Camden Council - Suspended pending further research
- Future Metro Phase 2 - Birmingham West Route along Hagley Road West
- Close roads in Blackheath town centre for “In Town Without my Car Day”
- Possible Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)
- Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)
- Showcase route extension and improvements (not all route funding secured).
- Improvements of branding to increase attractiveness of public transport
- Improving access to information regarding transport options
- Promote Midland Metro extension (Wednesbury to Brierley Hill)

- Future Metro Phase 2 – 5W's. Wednesbury to Walsall Varity North – A34 Birmingham to M6 Junction 7 Birmingham West – Birmingham to Quinton.
- Increased bus lane enforcement (increase number of cameras on buses for bus lane enforcement)
- Introduction of Red Routes to ease congestion
- Improvement of Traffic Urban Control Systems designed to reduce congestion
- Support use (reopening) of Stourbridge – Walsall line for rail freight
- AQ guidance - Provide guidance in relation to air quality for developers to follow when submitting planning applications
- Congestion charging – the council will continue to monitor the implications and effectiveness of any congestion charging proposals
- Develop strategy to encourage drivers not to allow their engines to idle when parked
- Establish a programme of vehicle emission testing
- Promote car sharing among residents and businesses in the area

The remaining 18 Actions were on-going.

#### **7.6.5.1. Relationship between AQAP and monitoring data**

Of the 12 AQAP Actions that were completed, those that are most relevant to the Roadside monitoring site are:

- M5 J1-J2, Oldbury & West Bromwich & M6 J7-J8/M5, Great Barr & Yew Tree
  - Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week – Completed 2006
  - An improved system of contingency planning for the motorway network has been implemented to improve traffic flows – Completed 2006
  - Evaluate the suitability of active traffic management to improve traffic flows on the M6 – Completed 2011
- Newton Road/Birmingham Road (A34), Great Barr
  - Route 51 improvements – a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards – Completed 2008

The measures to improve traffic flow on the M6 implemented in 2006 may have contributed to a reduction in local NO<sub>2</sub> concentrations at Wilderness Lane (Great Barr).

The Route 51 improvements were also intended to ease traffic flows on Junction 7 of the M6 so may also have had an effect on locally measured NO<sub>2</sub>. There is no Roadside data on which to calculate local NO<sub>2</sub> after 2010 to determine the effectiveness of the measure implemented in 2011.

#### **7.6.6. City of York Council (York AQMA)**

City of York Council submitted its first AQAP to Defra in July 2004. This AQAP set out the initial measures City of York Council intended to take to achieve a reduction in nitrogen dioxide concentrations across the city. The measures included in the first AQAP were those that were considered to be the most cost effective and appropriate for York at that time. They were drawn up following extensive participatory consultation with residents, businesses and key stakeholders and were reviewed by the council's air quality steering group.

In April 2006 CYC produced its second Local Transport Plan (LTP2). The development of LTP2 offered an opportunity to review the content of AQAP1 and to reconsider some of the air quality improvement measures which had previously been discarded due to lack of funding, or incompatibility with LTP1. Annex U of LTP2 contained a revised AQAP known as AQAP2, a copy of which was sent to DEFRA in April 2006. AQAP2 differs from AQAP1 in that it was developed alongside, and is fully integrated into the Local Transport Plan. The measures within AQAP2 were consulted upon as part of the wider LTP2 consultation process but in general closely reflect the measures included in AQAP1. The emphasis remains on reducing the need to travel by motorised vehicles. The plan contains 28 key action points listed under the following 8 headings:

- 1) Reducing the need to travel by motorised vehicles
- 2) Encouraging walking and cycling
- 3) Encouraging use of public transport
- 4) Encouraging the use of cleaner, alternatively fuelled and smaller, more fuel efficient vehicles
- 5) Improving traffic management and reducing congestion
- 6) Reducing emissions from HGVs
- 7) Reducing emissions from buses
- 8) Reducing emissions from non-transport related sources

The main changes made between AQAP1 and AQAP2 were:

- The removal of measures and key action points which had already been achieved by 31st March 2006



- The setting of new key action points in areas where significant progress had already been made
- A greater emphasis on the need to reduce emissions from individual vehicles rather than just reducing the overall number of vehicles
- Inclusion of longer term targets to take the AQAP forward to 2010/11

Accounting for the overlap in measures implemented in both AQAP1 and AQAP2 a total of 40 Actions were included in the combined plans (Appendix 11. Table 6). Of these 40 Actions, 27 (67.5%) were completed; seven (17.5%) were on-going and six (15%) were not implemented. Successful measures cover most of the eight categories above and include:

- Reducing the need to travel
  - AP1: Adopt supplementary planning guidance on sustainable design and construction
  - *AP4: Have a car club operational in the city*
- Encouraging walking and cycling
  - AP5 : Develop and adopt a new cycling strategy; AP32: Provide covered lockable cycle parking at all council-run schools by 31st December 2011
  - *AP6: Develop and adopt a new pedestrian strategy*
  - AP8: Have school travel plans in place at all schools in and adjacent to the AQMA; AP33: Have active school travel plans in place at all York schools by 31st December 2010.
- Encouraging the use of public transport
  - AP9: Open a 6th Park and Ride site; AP34: Increase capacity at Askham Bar by 250 spaces by 31st December 2007
  - *AP10: Increase bus patronage on the 'Metro' bus routes to 28%*
  - *AP12: Publish and adopt a new bus information strategy*
  - AP14: BLISS priority measures to be introduced on 5 bus routes; AP38: Introduce real time bus information on 3 more routes by 31st March 2007; AP39: Introduce bus information SMS text messaging service by 31st December 2006
  - *AP15: Introduce further reductions on day travel tickets for disabled residents and residents over 60*
  - *AP17: Introduce a discount scheme relating to travel with Yozone cards*
  - AP35: Introduce bus priority measures on A19 by 31st December 2011
  - AP36: Undertake a trial of PBYB ticketing by 31st December 2006

- AP37: Have 10 fr buses operational in the city by 31st March 2006
- AP40: Provide 4 city centre information kiosks by 31st December 2006
- Encouraging the use of alternative fuels and smaller more fuel efficient vehicles
  - *AP20: Produce and adopt a Fuel Efficient Vehicles and Alternative Fuels Strategy*
  - *AP21: Introduce reduce parking charges and designated parking bays for smaller, more fuel efficient vehicles; AP44: Investigate possibility of introducing graduated parking charges based on vehicle age, engine size or fuel type by 31st December 2011.*
  - AP45: Complete a feasibility study into a Low Emission Zone for the city by 31st March 2007
- Improving traffic management and reducing congestion
  - AP18: An investigation into options for improving the outer ring road to be carried out; AP46: Complete Outer Ring Road (ORR) upgrading works at Hopgrove Roundabout and Moor Lane by 31st March 2011
  - *AP19: 800 users to be registered on the car share web site*
  - AP22: Have a fully functional Traffic Congestion Management System (TCMS) operational in the city
  - AP24: Develop and adopt a freight strategy and action plan; AP47: Develop and adopt a lorry routing strategy by 31st March 2008
  - AP48: Undertake a feasibility study into a transshipment centre for York by 31st December 2011
- Reducing emissions from non-transport related sources
  - *AP26: Update the York emissions inventory*
  - *AP27: Undertake a campaign to highlight the requirements of smoke control orders; AP51: Undertake annual campaigns to highlight provisions of smoke control orders*
  - *AP28: Undertake and energy efficiency survey of domestic properties within the AQMA; AP53: Set up an energy partnership by 31st December 2007*
  - *AP29: Introduce an annual programme of awareness raising to coincide with bonfire night; AP52: Undertake annual campaigns to raise awareness about emissions from bonfires*

Thirteen of the completed Actions were undertaken in LTP1 (in *italics*); the remaining 14 were taken up and pursued through LTP2 and LTP3. There were a number of measures aimed at encouraging modal shift, through making provision for cycling and improving the bus services and reducing congestion. There were very few location-

specific measures implemented, with the exception of AP35: Introduce bus priority measures on A19 (complete 2011); and AP46: Complete ORR upgrading works at Hopgrove Roundabout and Moor Lane (completed 2009). These two measures are likely to have had most impact at Fishergate and Heworth Green respectively. Local NO<sub>2</sub> concentrations have fallen at Fishergate in 2011 and are showing an overall downward trend, despite very high concentrations in 2010, potentially due to the knock-on effect of the road improvement works under construction. At Heworth Green, however, local NO<sub>2</sub> concentrations have been higher since the works undertaken at Hopgrove and Malton Road roundabout, and, although concentrations have fallen over the last three years (2010-12), they are still higher than, or as high as, before 2009, resulting in an upward trend at this site.

Ongoing measures, many of which were delayed by reductions in LTP2 funding, include:

- Encouraging walking and cycling
  - AP7: Undertake a foot streets review; AP31: Include at least one additional street in the Footstreets Pedestrian Priority Zone by 31st December 2011.
- Encouraging the use of public transport
  - AP41: Open a new rail station at Haxby by 31st March 2009 (subject to exceptional scheme funding being received)
- Encouraging the use of alternative fuels and smaller more fuel efficient vehicles
  - AP42: Undertake an alternative fuels and smaller vehicles awareness campaign by 31st December 2008
  - AP43: Undertake a review of the taxi licensing process to identify ways in which it could be used to encourage the use of cleaner taxis and private hire vehicles
- Reducing emissions from heavy goods vehicles and buses
  - AP25 : Develop and adopt a new coach strategy and action plan;
  - AP49: Work with bus companies to ensure that 89% of public service buses operated in York (including park and ride services) meet Euro III emission standards or better by 31st December 2011
- Reducing emissions from non-transport related sources
  - AP54: Display energy information in all council buildings by 31st December 2011

Unimplemented measures, again many of which were halted by a lack of funding, include:

- AP2 : Provide 16 lifetime residential units in the city
- AP11 : Increase the percentage of households within a 13 minute walk on an hourly or better by 60%
- AP13 : Undertake personalised journey planning for all employees of the three largest employers in the city
- AP16 : An investigation into the role of river transport to be included in the 2006-2011 local transport plan
- AP23 : Develop and adopt a strategy for powered two wheelers
- AP50: Complete a feasibility study into the introduction of a city centre electric shuttle bus by 31<sup>st</sup> December 2006

York City Council has reported the following successes resulting from LTP1:

- Success in restricting traffic growth, with peak period traffic levels limited to 1999 levels despite a continued increase in car ownership ;
- Bus patronage increased by 49% since the start of LTP1. In recognition of this First York, the major bus operator in York, received the Public Transport Operator of the Year Award 2005;
- Continued success of Park & Ride services which now attract more than 2.3 million passengers each year;
- Maintaining of the city's status as the UK's top cycling city (ERCDDT assessment - 2004), with cycling levels well above the national average;
- Achieving walking targets four years ahead of schedule through the delivery of extensive pedestrian improvements across the city.
- York is the leading authority in the management of traffic, with the pioneering Traffic Congestion Management System (TCMS) and Bus Location Information Sub-System (BLISS) systems.

York City Council have implemented a large number of significant measures and are progressing with many others, including a Low Emission Strategy (which has latterly underpinned many of the measures), a potential Low Emission Zone, reopening Haxby railway station and opening a new Park and Ride.

#### **7.6.6.1. Relationship between AQAP and monitoring data**

The introduction of bus priority measures on the A19 south of Fishergate was completed in 2010 with some amendments implemented in 2011. Local concentrations of NO<sub>2</sub> had been increasing from 2007 to 2010, but fell back to previous levels in 2011 and 2012. Whether the construction of the bus priority measures contributed to the increased concentrations in 2009-2010, or whether their completion led to the subsequent reduction in local NO<sub>2</sub> is unclear, however concentrations were not lower in 2011-2012 than they were prior to construction, suggesting the latter may not be the case.

The introduction of FTR (Future) buses on Route 4 in May 2006 may have contributed to the reduced concentrations of local NO<sub>2</sub> at Gillygate and Holgate in 2007, though concentrations in Gillygate steadily increased thereafter to 2011. It is understood that the FTR buses were discontinued in 2012 following complaints of added congestion.

Improvements to the A64 and A1237/A1036 Hopgrove and Malton Road roundabouts in 2009 may have relieved congestion at Heworth Green, though any benefit appears to have been short-lived with higher local NO<sub>2</sub> concentrations recorded from 2010.

It is anticipated that any improvements in congestion resulting from the introduction of the Traffic Urban Congestion Management system in 2008 would have been experienced at all sites, but the evidence of an effect on local NO<sub>2</sub> does not appear to be clearly reflected with concentrations at most sites increasing over the subsequent period.

No other measures implemented were either in place before 2012 or were considered to have had a specific effect on concentrations at any monitoring site. In all cases, although implemented measures may not necessarily be attributed to improvements in local NO<sub>2</sub>, there is no way of knowing what concentrations would have been had they not been implemented.

#### **7.7. Evaluation of AQAP measures**

Table 7.3 shows each of the case study local authorities with the number of measures that had included information related to each of the SMART targets, with the number of 'completed' measures shown in brackets. As described in Section 6.5.2 and presented in Appendix 1Appendix 12:, each of the AQAP measures was scored against the SMART criteria (as presented in the Table 7.3 headings), with a score of 1 achievable against each, and an overall score out of 5. Figure 7.62 shows that that the majority of measures (44%) scored 3 out of 5 or 4 out of 5 (31%). As can be seen in both Table

7.3 and Figure 7.63, measures tended to include information regarding responsible parties (Assignable, 89%), cost-effectiveness (Realistic, 87%) and a timeframe for implementation (Time-related, 92%), but far fewer (32% and 21% respectively) were considered to be either Specific to the AQMA/source or included any Measurable key performance indicators. This is reflected across all of the case study local authorities, with three of them having no measurable aspect to any of their AQAP measures and hence no measures scoring full marks in their overall SMART score. Bristol CC had the highest number of measures achieving a SMART score of 5, and the highest number of measures that were considered Specific / Measurable, but only had one fully 'completed' measure in total. York CC had the highest number of implemented measures (27), and a high proportion of those considered Specific included these, however, only eight measures were considered Specific. Leicester CC had no 'completed' measures, but this may be due more to the absence of progress reporting on implementation rather than a true reflection of events.

**Table 7.3: Numbers of measures with SMART scores ('completed' SMART measures in brackets) by case study Local Authority**

Case study LAs	Total measures	Specific	Measurable	Assignable	Realistic	Time-related	SMART score = 5
Barnsley MBC	38 (10)	6 (2)	20 (4)	37 (10)	29 (8)	37 (10)	3 (1)
Bristol CC	59 (1)	26 (1)	22 (1)	55 (1)	45 (1)	52 (1)	14 (1)
Leicester CC	54 (0)	12 (0)	0 (0)	37 (0)	52 (0)	52 (0)	0 (0)
Oxford CC	40 (3)	19 (3)	0 (0)	31 (3)	31 (3)	31 (3)	0 (0)
Sandwell MBC	56 (12)	21 (9)	0 (0)	56 (12)	53 (12)	53 (12)	0 (0)
York CC	40 (27)	8 (7)	18 (15)	39 (27)	39 (26)	38 (27)	7 (6)
Totals	287 (53)	92 (22)	60 (20)	255 (53)	249 (50)	263 (53)	24 (8)

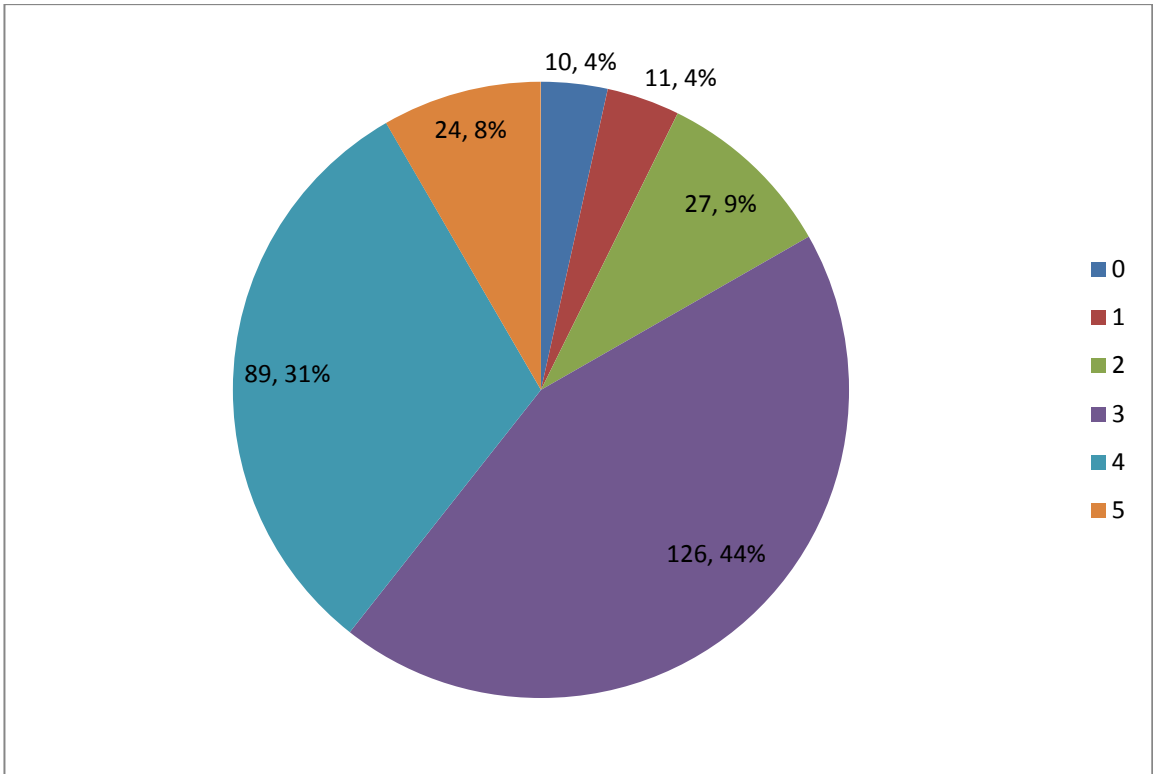


Figure 7.62: Number and percentage of measures with respective Total SMART scores

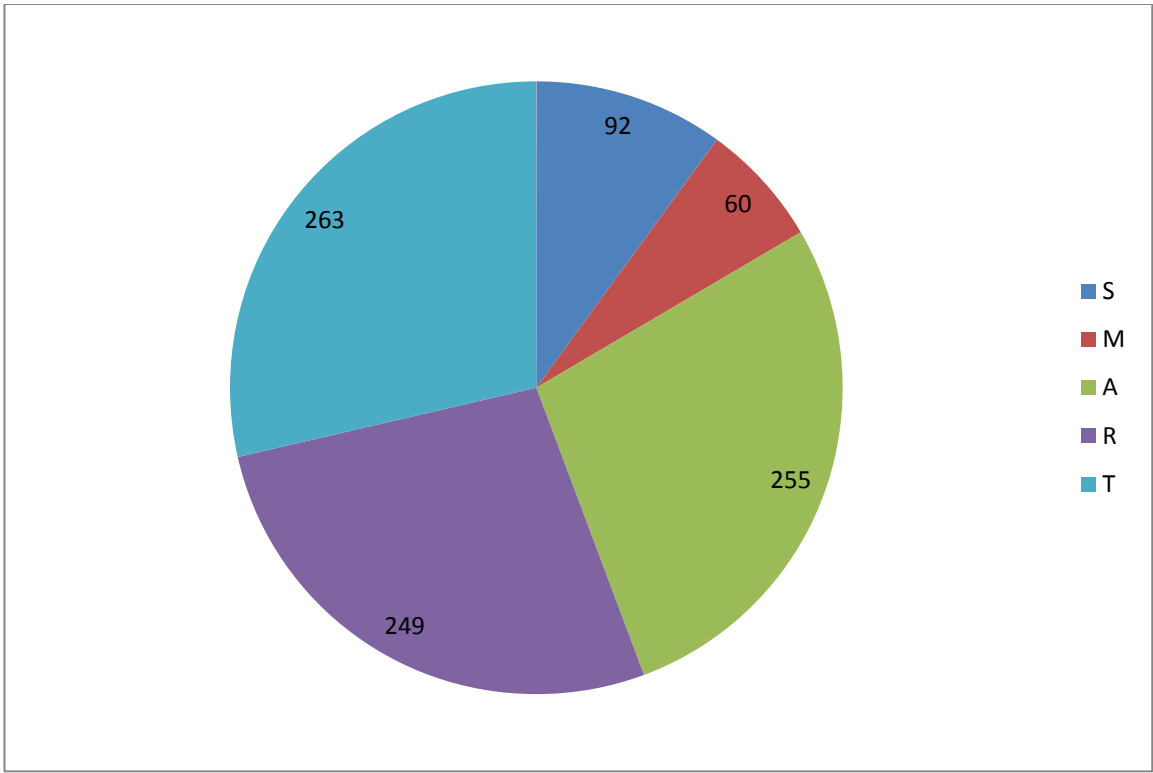


Figure 7.63: Number of measures scoring in each of the SMART categories (n = 294)

## **7.8. Summary**

This chapter presents a critical analysis of the Results showing the Round 1 baseline AQMAs, the stages in the selection criteria, the resulting case study local authorities, their monitoring sites and data, the calculation of the local contribution nitrogen dioxide trends for each site, an examination of the AQAP measures implemented in relation to the trend data and a critical evaluation of the AQAP measures using SMART analysis. The following chapter discusses the findings in the context of the thesis statement and the research objectives.



## **CHAPTER 8. DISCUSSION**

### **8.1. Chapter overview**

This chapter presents a discussion of the Methods and Results in turn following the structures of those two chapters. The first part critically discusses the rationale and limitations of the methods in practice and the implications these have for the appropriateness of the approach and the conclusions that can be drawn, with the second part focussing on a critical analysis of the results of that methodology and how these respond to the research objectives, and support or contradict the thesis statement.

### **8.2. Discussion of methods**

Chapter 5 set out the epistemological thinking that underpinned the approach to addressing the thesis statement and research objectives. In essence the approach used a pragmatic combination of positivism and interpretivism, drawing on the available evidence of monitoring data, to identify trends in local concentrations of annual mean nitrogen dioxide relevant to the selected AQMAs, and the Review and Assessment and Action Planning reports, to assess progress with AQAP measures and relate these to changes in local nitrogen dioxide trends.

#### **8.2.1. Sample selection**

In order to ensure a robust sample for deductive interpretation of the results it was considered necessary to standardise the data used. For that purpose the research focused on trends of nitrogen dioxide annual mean in AQMAs declared for road traffic sources in England. A secondary, but equally valid, reason for defining the sample in this way was to ensure that the research was manageable within the confines of a PhD. In theory, it would have been possible to undertake this research on the whole UK AQMA dataset including those declared for other pollutants and other sources, however, the variability within this dataset would have meant the results were not comparable and the volume of data analysed would have taken much longer and required much greater resource than was available. The rationale for the use of the selection criteria identified here are presented in section 5.3.1, but essentially, they were selected as providing the largest possible sample on which to draw, with the majority of AQMAs occurring in England and declared for the nitrogen dioxide annual mean objective primarily for road traffic sources.

The sample was further focused on those AQMAs declared from Round 1 of the Review and Assessment process. The reasoning behind this selection was that in

order to be able to link any change in nitrogen dioxide trends with implementation of the AQAPs, there needed to have been adequate duration for the local authorities to have been able to prepare and implement AQAP measures. This issue is also picked up later in section 8.2.3. The Round 1 AQMAs were first identified through examination of the Review and Assessment and AQMA databases maintained by UWE under the Defra and Devolved Administrations Review and Assessment contract. This procedure was not straightforward as the database comprised a number of tables that had been used to record data for the purposes of the contract and were not necessarily designed to be able to identify AQMAs that had been declared exclusively from Round 1 on the basis of pollutant, objective, source or country. The lack of a common field between the tables further complicated the relation of these tables to one another to derive this list. A definitive list of 81 local authorities that had declared AQMAs for the nitrogen dioxide annual mean objective from Round 1 on the basis of road traffic sources was found by comparing the database tables and investigating discrepancies between them by reference to the Review and Assessment reports.

It was also recognised that in order to be able to identify local nitrogen dioxide trends it would be necessary to identify monitoring sites that were relevant to the AQMAs. Again, this is discussed further in section 8.2.3. The relevance of this point here is that this would require a spatial dataset of AQMAs to enable the spatial relationship between monitoring sites and AQMAs to be calculated using GIS. The earliest spatial dataset of AQMAs available from Defra was dated July 2005 and comprised 158 AQMAs declared for the nitrogen dioxide annual mean objective in 83 local authorities in England. This arbitrary cut-off date included all of the AQMAs that had been declared in Round 1 and also some declared early in Round 2. There were also some AQMAs that had been identified from the databases but that were not included in the spatial dataset as declaration had actually been delayed to take account of new data presented in Stage 4/Further Assessment reports. This highlights one of the issues with utilising this early cohort of local authorities as many of these AQMA declarations would have been made on the basis of predictions made using modelling software. Use of modelling software was diverse and often unsophisticated in these early stages of LAQM and, as a result, modelled exceedences may have been less accurate than desired (Woodfield *et al.*, 2003; Marsden and Bell, 2001). Furthermore, modelling of future year concentrations were dependent on forecast emission factors, which have subsequently been shown to be flawed (Carslaw *et al.*, 2011). In addition, the local authorities declaring AQMAs in this dataset would have been subject to changing guidance on monitoring, modelling, reporting, AQMA declaration and AQAP

development. The first set of statutory policy and technical guidance was published in 1997/8, revised in 2000, and more substantially updated in 2003 and March 2005, specifically and crucially in the latter (LAQM.PGA(05)) providing guidance on AQAP evaluation and integration, for traffic-related AQMAs, into Local Transport Plans (LTP), and implementing an Order under Section 6 of the Local Government Act to preclude “excellent-rated” local authorities from the requirement to produce either AQAPs or LTPs. The spatial dataset of AQMAs does not include data on the AQMA declaration dates (except that they were declared prior to July 2005), however the database tables, amended for missing data using the recently produced list of local authorities with AQMAs on the Defra website<sup>21</sup>, reveal that the majority of AQMAs in this Round 1 selection were declared in 2001 (46%), with 21% in 2002, 22% in 2003, 8% in 2004 and 2% in 2005. Most AQMA declarations therefore are likely to have followed the guidance available in 2000, with approximately one third having access to the revised 2003 guidance and few, if any, referring to the 2005 update. The majority of original AQAPs from these selected local authorities were produced in 2004 (43%) and a further 18% in 2005, indicating that many local authorities may have declared AQMAs under one set of guidance and produced AQAPs under another set of guidance. It is clear that LAQM, particularly in these early stages, is a dynamic and constantly evolving process, however, by standardising the declaration deadline using the earliest spatial dataset, the variability between local authorities and between AQMAs is minimised.

One of the limitations of using the Defra AQMA spatial dataset is the necessary reliance on the presumed accuracy of this data. There was no metadata provided with the dataset, so, other than the date in the filename (July 2005), there was no indication of exactly when the dataset was compiled, the projection/coordinate system used or, crucially, the completeness or accuracy of the data within. Datasets for subsequent years was also provided by Defra (although not apparently produced to a regular timeframe), and so an attempt was made to identify and map amendments to the AQMAs over the period of the research. This quickly proved extremely difficult as duplication, misattributes and inaccurate digitisation of AQMAs became apparent in later datasets. Although the July 2005 dataset did not appear to have these problems, completeness and attributes having been verified against the Round 1 AQMAs

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<sup>21</sup><http://aqma.defra.gov.uk/aqma/list.php>

identified from the Review and Assessment and AQMA databases, there were still potential uncertainties over the digitised AQMAs which could not be verified.

### **8.2.2. Spatial comparison of AQMA dataset and Zones and Agglomerations**

There were also issues with the Zones and Agglomerations GIS dataset provided by Defra, with a number of unattributed records in the dataset. An alternative dataset obtained from the EEA Airbase (v.6) provided compliance assessment data for the UK for 2010. While not directly relevant to the 2005 AQMA dataset, it was useful to spatially relate the AQMAs with the Zones and Agglomerations. Although no AQMAs were identified that were not within a Zone or Agglomeration that was in breach of the nitrogen dioxide annual mean limit value, the inconsistencies between the AQMAs' (and local authorities') boundaries and the Zones and Agglomerations was made apparent, with a number of AQMAs intersecting more than one Zone or Agglomeration. The implications for this in terms of the research statement, is that there is no direct nesting of reporting areas in the UK to facilitate aggregation of local exceedences being reported to the European Commission (EC). This serves to exemplify the two-tier system of air quality management that currently exists in the UK whereby local assessment and reporting to Defra and Devolved Administrations is not coordinated with national assessment and reporting to the EC.

### **8.2.3. Data availability**

Having established standardised Round 1 baseline AQMAs and local authorities as accurately as possible, implementation of the proposed methodology in response to the Research Objectives, required an assessment to be made as to the availability of data. There were three aspects to this: (a) availability of AQAPs and AQAP Progress Reports against which to determine progress in implementation; (b) availability of relevant monitoring sites to enable local road-contribution concentrations of nitrogen dioxide to be calculated; and (c) availability of nitrogen dioxide monitoring data on which to calculate those trends of local road-contribution nitrogen dioxide concentrations. A set of criteria was established to account for each of these to identify which AQMAs/local authorities from the Round 1 baseline dataset were able to be used in this research.

- Criterion 1: AQAPs produced prior to 1/1/2006 and AQAP-PRs produced after 2008.

- Criterion 2: Traffic Urban and Background Urban AURN monitoring sites with annual data capture >75% and data capture 2005-2012 >75%, i.e. at least six years' data.
- Criterion 3: Traffic Urban NO<sub>2</sub> monitoring sites <0.5 km from AQMAs and Background Urban NO<sub>2</sub> monitoring sites <5 km from AQMAs.

These criteria are partly devised to make best use of the available data to maximise the potential sample size, and partly to ensure robustness of data based on evidenced criteria.

#### **8.2.3.1. Criterion 1: AQAPs produced prior to 1/1/2006 and AQAP-PRs produced after 2008**

This criterion is based on the availability of AQAPs and AQAP Progress Reports to maximise the potential sample size. In order to define the criterion, it was therefore necessary to obtain as many AQAPs and AQAP PRs relating to the Round 1 baseline local authorities as possible. The sources of these reports were primarily from Defra consultants and local authority websites, and sourcing and obtaining these reports was a very laborious and time-consuming process. In addition to AQAP PRs, Review and Assessment Progress Reports and Updating and Screening Assessments were also obtained from the local authority websites where these contained AQAP progress updates. AQAPs were obtained for all but one local authority (South Oxfordshire Council) and AQAP PRs were available for all but 11 of the 83 local authorities (Brentwood Borough Council, Hertsmere Borough Council, King's Lynn and West Norfolk Borough Council, Lincoln City Council, Liverpool City Council, Luton Borough Council, Northampton Borough Council, Oadby & Wigston District Council, Oswestry Borough Council, Shrewsbury & Atcham Borough Council, Walsall Metropolitan Borough Council). Of these local authorities with missing AQAP PRs, only Oadby & Wigston District Council was noted to have revoked its AQMAs in April 2008 meaning that the others should have been available. Local authorities were not directly contacted for reports, except where web links appeared to be broken, as it was considered important to attempt to undertake the research on the basis of readily available data. The dates of these AQAPs and AQAP PRs/PRs/USAs were noted and the modal year identified: for local authorities' first AQAPs this was 2004 and for AQAP PRs (or similar containing AQAP PR data) this was 2010. The cut-off dates of <1/1/2006 for AQAPs and >2008 for AQAP PRs were therefore devised on the basis of maximising the number of local authorities with available reports for these periods and ensuring that there would be an adequate duration between preparation of the first AQAP and publication of subsequent AQAP PRs to enable implementation of AQAP

measures. Clearly the duration required would depend on the nature of the measures to be implemented, however, a three-year minimum implementation period was considered adequate. Of the 158 2005 AQMAs, 105 of them (covering 55 local authorities) met the criterion for AQAP PRs, representing 66%. Sensitivity analysis indicated that increasing the AQAP cut-off to 1/1/2007 alone would only increase the number of local authorities to 59, and including AQAP PRs for 2008 alone would increase the number of local authorities to 60. Adjusting both cut-off dates in this manner would result in 65 local authorities (78%) but would reduce the minimum period for implementation of AQAP measures to just one year. It was not considered that this would add value overall as it was unlikely that many AQAP measures would be implementable in such a short timeframe. Adjusting just one of the cut-off dates was also not considered worthwhile as only a relatively small number of additional local authorities would have been added and the timeframe for AQAP implementation would also be reduced.

**8.2.3.2. Criterion 2: Traffic Urban and Background Urban AURN monitoring sites with annual data capture >75% and data capture 2005-2012 >75%**

The basis for this criterion is the requirement for robust data on which to calculate trends in local nitrogen dioxide concentrations. The use of 75% annual data capture is used as this is the threshold that Defra report annual mean AURN data to the EC and is how the data is made available via the Defra AURN website. The EC require that only sites meeting 90% data capture are reported, however, by lowering the threshold Defra are able to report more monitoring sites' data, albeit at a lower degree of accuracy (Stedman *et al.*, 2013).

The 75% data capture for the period 2005-2012, representing at least 6 years' data, is used to make best use of the available data covering the duration of the AQAPs and AQAP PRs to ensure sufficient data on which to calculate a trend. In calculating local concentrations of nitrogen dioxide, data from both roadside and background sites are required for matching years. By applying the 75% data capture criterion over eight years for each site type there will be a minimum of four matching years' data on which to calculate local nitrogen dioxide trends. The use of AURN monitors is discussed in section 5.3.1.2, but essentially their purpose is again to ensure robustness and comparability of the data that is relevant to the UK's compliance assessment reporting to the EC. EU site type classifications for each monitoring site were also identified from a related dataset and added to the monitoring data via a relational query using MS Access. Unfortunately, five of the 77 sites that met the data capture criterion had been

identified as not meeting the siting criteria as stated in the Air Quality Framework Directive 2008/50/EC (Eaton, 2010), and as a result were not considered representative (Table 6.2). As only 77 (43%) of the AURN sites had met the data capture criteria, these misplaced sites were retained until their necessity could be clarified in light of Criterion 3. This highlights an issue associated with reliance on AURN sites, which despite being the best available dataset in terms of robustness and relevance to the research statement with respect to reporting against the nitrogen dioxide annual mean limit value, is still dependent on correct operation by Defra and its consultants.

#### **8.2.3.3. Criterion 3: Traffic Urban NO<sub>2</sub> monitoring sites <0.5 km from AQMAs and Background Urban NO<sub>2</sub> monitoring sites <5 km from AQMAs**

The principle behind this criterion is that local concentrations of nitrogen dioxide, i.e. that which the local authority can reasonably be expected to have some influence over, can be calculated as roadside concentrations minus background concentrations. This assumption is used by the National Atmospheric Emissions Inventory (NAEI) to calculate roadside increment of NO<sub>x</sub> emissions (Stedman *et al.*, 2013). While it is recognised that the direct translation of this approach to NO<sub>2</sub> concentrations is a gross simplification, given the non-linear relationship between NO<sub>x</sub> and NO<sub>2</sub>, it is considered that the principle stands, and that as a consistent comparison between sites over time, remains a valid and useful approach, particularly as it is NO<sub>2</sub> concentrations, rather than NO<sub>x</sub> emissions, that local authorities report to Defra under their LAQM statutory duties and which Defra report to the EC under the AAQD.

The identification of roadside and background sites follows the EU site type classifications applied to the AURN sites of Traffic Urban and Background Urban respectively. The definition of the application of these site type classifications in terms of their representativeness to specific areas (e.g. AQMAs) is not clearly defined, but, based on a combination of the Defra and AAQD 2008/50/EC descriptions, distance criteria of <0.5 km for Traffic Urban and <5 km for Background Urban sites was used with respect to the AQMAs. This corresponds with the stipulation that background sites must be representative for several square kilometres, but less than 5 km distant, as this is the lower distance threshold which Defra specify for rural/remote sites. In addition, the literature supports the generalisation that roadside concentrations of nitrogen dioxide reduce to background levels within 500 m of source (Baldauf *et al.*, 2009; Zhou and Levy, 2007). Clearly these are generalisations and each site must be considered on its own merit to determine whether it can be considered as representative of local or



background concentrations in that area, but as a broad-brush basis for site selection these distance criteria serve their purpose. Representative rural/remote sites were also identified (as >5 km and <50 km from an AQMA), again, using the Defra and AAQD descriptions, however these sites were not used within the calculation of local NO<sub>2</sub> as they were considered to be too remote to be adequately representative and so can be disregarded.

Details and grid references for closed and operational AURN monitoring sites were provided by Defra's consultants, Ricardo-AEA. Accurate mapping of the monitoring sites in GIS is therefore dependent on the accuracy of the grid references supplied. The spatial dataset for the monitoring sites was joined to the monitoring data before determining their relationship to the AQMAs so that only those sites which met the data capture criteria were considered. Both datasets used standardised site names, verified by eye, and so this was used as the common field on which to join the datasets. All but one of the sites (Glasgow City Chambers) which had met the data capture criterion were represented in the spatial dataset, however this site was not relevant for any of the England AQMAs.

Of the 76 AURN sites that had met the data capture criteria for which GIS data was available, there were 16 sites classified as Traffic Urban and 35 classified as Background Urban. By separating the monitoring sites by EU site type, their representativeness of the AQMAs could be determined based on the distance criteria discussed above. Only four of the Traffic Urban AURN sites were considered representative, i.e. were within 0.5 km of four AQMAs in four local authorities, and only 15 Background Urban sites were representative of 38 AQMAs in 23 local authorities. Only two AQMAs were common to both, i.e. had both Traffic Urban and Background Urban monitors to enable the local NO<sub>2</sub> concentration to be calculated, (Bristol AQMA and Bury AQMA), but both of the representative Traffic Urban monitors at these sites had been identified as not meeting the EU siting criteria, and so may not actually be representative at all. If only those AQMAs relating to local authorities that comply with Criterion 1, i.e. have adequate AQAP and AQAP PRs available to determine implementation of AQAP measures, are taken into consideration, only Bristol AQMA also meets Criteria 2 and 3 for both Traffic Urban and Background Urban monitors.

#### **8.2.3.4. Evaluation of selection criteria**

It is clear that the combination of Criteria 2 and 3 are the limiting factors with 75% of all of the Round 1 Baseline AQMAs having no AURN sites that meet both data capture and siting criteria, and only two AQMAs having both Traffic Urban and Background



Urban monitoring sites that meet both criteria. Criteria 1 has had a less severe impact on the overall sample number, but still reflects that there are a number of local authorities that were unable to keep to the reporting schedule of 18 months from declaration for an AQAP and/or for which there are an apparent lack of annual AQAP PRs. It may be considered that the criteria specified in this methodology have been too strict, however, there are strong justifications for each of them, and any weakening of them would only serve to weaken the ability to draw robust conclusions thereon. It is therefore considered that the inability of the LAQM regime to be able to provide robust measurable data that can contribute towards achieving the EU limit value for the nitrogen dioxide annual mean serves to support the thesis statement that Local Air Quality Action Plans are not successful in terms of reducing local concentrations of nitrogen dioxide and therefore Local Air Quality Management will not achieve the annual mean UK air quality objective and will therefore not make an effective contribution to meeting the relevant EU limit value.

#### **8.2.3.5. Use of local authority continuous monitors**

Although local authorities are not required to follow EU siting criteria, they are expected to adhere to a rigorous Quality Assurance/Quality Control (QA/QC) protocol in the maintenance and operation of the continuous monitors, which is reported in the Review and Assessment reports. Some confidence could therefore be attributed to the data from these local authority monitors. Continuous monitors are expensive and difficult to site, however, so their utility is limited among local authorities. Consideration was also given to the use of passive diffusion tube data, which are much more widely used by local authorities. Diffusion tubes have a much higher degree of uncertainty associated with their results ( $\sim\pm 25\%$ ) relative to continuous monitors ( $\sim\pm 15\%$ ), in part due to variability in laboratories/preparation methods, potential for erroneous siting, application of national/local bias adjustment factors, distance adjustment, etc., all of which are liable to vary between and even within local authorities over the years. It was not therefore considered appropriate to compare continuous monitoring and passive diffusion tube monitoring data. Use of Defra's national background modelling was also considered, however, despite calibration against local monitoring data, the model has been shown not to adequately reflect local concentrations as the spatial resolution is too coarse. It was also not considered appropriate to combine monitored and modelled data in calculation of the local nitrogen dioxide concentration.

There is no comprehensive database of details or data for local authority monitors, although Ricardo-AEA does now maintain an online resource providing access to, currently, 66 local authority monitoring sites and their data<sup>22</sup>. Details and data for 185 local authority continuous monitors were therefore taken from the Review and Assessment reports. The accuracy of these data is therefore dependent on the reliability of the local authorities' reporting. Although report templates and improved guidance have been provided for local authorities in recent years, despite rigorous appraisal, there has been a large degree of variability in local authorities' reports, particularly in recording monitoring site details, which has hampered the process of extracting valuable information regarding local authorities' continuous monitors, e.g. accurate grid references, consistent site type classifications and even site names. Discrepancies were identified in grid references, site names and site types, particularly where AURN sites reported by local authorities could be verified against Defra's records. Inconsistencies were also observed in local authorities' reporting of AURN annual mean concentrations compared with Defra. This discrepancy is probably due to the fact that AURN data is not ratified until September so, at the time that local authorities were preparing their reports to meet the April deadlines, the AURN data may not have been fully ratified.

The same site selection criteria as had been used for the AURN sites were used for the local authority monitors for consistency. Of the 132 Traffic Urban sites, 83 (63%) were considered representative of the Round 1 Baseline AQMAs and 50 out of 53 (94%) Background Urban sites were also considered representative using the distance criteria 0.5 km and 5 km respectively. This, as might be expected, suggests that local authority monitors are more representative of AQMAs than AURN sites, but also indicates that more than one third of local authorities' Traffic Urban continuous monitors are sited more than 0.5 km from their AQMAs. Together with the AURN sites, there were 34 AQMAs in 25 local authorities with both Traffic Urban and Background Urban sites that met Criterion 3.

Application of the Criterion 2 data capture specifications reduced the number of valid Traffic Urban and Background Urban monitors down to 22 and 10 respectively. Closer examination of the local authorities' monitoring data revealed that in 90% of cases annual data capture rates were >75%, but that only 32% of sites had achieved 75%

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<sup>22</sup> <http://www.airqualityengland.co.uk/>

data capture between 2005 and 2012, i.e. had at least six years data on which to calculate trends. Sensitivity analysis revealed that 38% of monitoring sites would meet a 63% threshold (i.e. minimum 5 years' data) and 47% of sites could achieve a 50% threshold (i.e. minimum 4 years' data), however the chances of being able to match up representative Traffic Urban and Background Urban sites based on these reduced durations, and the validity of trends calculated thereon meant that it was not considered viable to reduce the percentage data capture for the period. Furthermore, the 75% data capture was retained to ensure consistency with the AURN data.

Using both local authority continuous monitors and AURN sites that met both Criteria 2 and 3 data capture and siting requirements, with reference only to AQMAs in those local authorities that had met Criterion 1 (AQAP and AQAP PR requirements), resulted in a selection of eight AQMAs in six local authorities.

#### **8.2.3.6. Further evaluation of selection criteria**

Taking into consideration all available continuous monitoring data and AQAP reporting for the period 2005-2012, it has proved impossible to provide adequate data on which to calculate robust trends of local concentrations of annual mean nitrogen dioxide, against which to measure implementation of AQAP measures, for more than a handful of local authorities. That there is no clear mechanism for measuring the effectiveness of AQAPs in reducing local concentrations of targeted pollutants means that local authorities cannot demonstrate the value of their actions in relation to the achievement of the air quality objectives, and fundamentally, for the purposes of this research, Defra cannot demonstrate their contribution to achievement of the limit values specified in AAQD 2008/50/EC.

#### **8.2.4. Case studies**

Having established the availability of data, the eight AQMAs in six local authorities were used as case studies in order to answer the research objectives:

*Objective 1: Document the change in the concentration of annual mean nitrogen dioxide from road traffic using continuous monitoring data, in AQMAs declared in Round 1 of Review and Assessment.*

*Objective 2: Evaluate whether the measures included in the Air Quality Action Plans produced following Round 1 are being achieved and whether implementation is contributing to an improvement in nitrogen dioxide concentrations.*

It is recognised that this small sample of local authorities and their AQMAs may not necessarily be representative of the wider local authority or AQMA populations, having

been selected on the basis that these were the only local authorities with adequate AQAP reporting and monitoring sites and data to facilitate the implementation of this methodology. The findings may not, therefore, be applicable to other local authorities, however, their value is in determining (a) whether, with adequate data available, this methodology can be implemented, and (b) whether any AQAP measures can be shown to have contributed to an improvement in local annual mean nitrogen dioxide concentrations.

#### **8.2.4.1. Comparing monitoring data**

There were 25 Traffic Urban sites (2 AURN and 23 local authority) and 7 Background Urban sites (4 AURN and 3 local authority) that were considered representative of the eight AQMAs across six local authorities. In each AQMA, Traffic Urban and Background Urban annual mean concentrations were matched and local nitrogen dioxide was calculated as the difference between them, based on the NAEI methodology used to attribute road-contribution NO<sub>x</sub> emissions (Stedman *et al.*, 2013). Having used 75% data capture across the eight-year period, there were at least four years' matching data on which to calculate trends of local nitrogen dioxide. Linear regression analysis was undertaken at each site to identify any significant trends in annual mean nitrogen dioxide concentrations (using the 95% confidence intervals) for Background Urban, Traffic Urban and calculated Local Contribution. This is a time-consuming approach, which is only viable for relatively small numbers of sites, but provides an in-depth assessment of the data and the relationship between the data from the Traffic Urban and Background Urban sites that can be related to the implementation of AQAP measures.

#### **8.2.4.2. Comparing Action Plans**

All of the original and subsequent AQAPs and AQAP PRs for each of the case study local authorities were reviewed and the AQAP measures extracted into an Excel spreadsheet. This was a very laborious process, even for the limited number of local authorities within this sample. Finding and extracting the relevant data from the reports was normally straightforward, however, it was sometimes hard to trace progress with measures where there were no (or inconsistent) references, where headings or details changed or where reporting on specific measures simply ceased. There was also a strong degree of overlap between some measures, which were occasionally merged in later reports. Frequent reference to acronyms also required some additional investigation to determine the nature of the measure. In the majority of cases, it was not necessary to refer to other reports, e.g. Local Transport Plans, as, if the AQAP and LTP had been integrated, the AQAP section was usually reported as a standalone

chapter or document. For Bristol City Council, however, the AQAP only included reference to additional measures to the LTP, and so it was necessary to try to extract air quality relevant measures from the LTP as well. This was more challenging as air quality was not necessarily explicitly considered in the LTPs.

Overall progress in implementation of each measure was determined as either 'Completed' (including year of completion, where available), 'Ongoing' or 'No longer reported' on the basis of their status in the last available AQAP PR, and this information was then used to compare with the local nitrogen dioxide concentration trends at relevant sites.

### **8.2.4.3. Evaluation of AQAP measures**

The AQAPs were also reviewed for SMART objective criteria to determine whether AQAP measures were:

- **Specific:** does the AQAP measure target the source of the exceedence?
- **Measureable:** does the AQAP measure include an indicator of progress?
- **Assignable:** does the AQAP measure have a clearly identified responsible assignee?
- **Realistic:** does the AQAP measure state what the expected improvement in air quality is likely to be, against the likely cost (cost-effectiveness)?
- **Time-related:** does the AQAP state when the measure is likely to be implemented?

The rationale for this approach was that AQAP measures are more likely to be implemented if information against each of these points is included in the AQAP. Each of the measures was scored against these criteria with one point available for each letter of the acronym that was included to give a maximum SMART score out of five. This assessment was not intended to score how realistic the measure is, for example, but simply whether the report had included any consideration of the cost-effectiveness of the measure. There actually may have been more value in evaluating the measures within these SMART categories, however, as information relating to these SMART objective criteria were not always straightforward to extract and rarely consistent between local authorities, or even within different reports from the same local authorities, this would have proved very difficult.

It is recognised that there are a number of subjective elements to this analysis, not least the consideration of specificity, though it is considered that any subjective bias would be systematic across all local authorities. There is also the subjectivity relating to

the consideration of an AQAP measure's 'completeness'. While this information was primarily taken from the local authorities lead, by reporting the status in the latest AQAP Progress Report, this may lead to unsystematic bias as different local authorities may have measures operating over longer timeframes, which, although may have achieved incremental implementation within the period of this study, would be reported as 'ongoing' rather than 'complete'.

### **8.3. Summary of discussion of methodology**

This section has critically discussed the methodology undertaken in this research, beginning with the epistemological approach as discussed in Chapter 5, and continuing through the selection of the Round 1 baseline AQMAs and local authorities, using the Review and Assessment and AQMA databases and GIS datasets, their spatial relationship with the UK Zones and Agglomerations, the criteria used to determine those local authorities and AQMAs with available data and finishing with the methods used in response to the research objectives using the resulting case study local authorities. Limitations and observations made on implementing this methodology are discussed in context above. The following section reflects on a discussion of the results.

### **8.4. Discussion of results**

This section looks back at the results and critically discusses them in the context of the thesis statement and research objectives.

#### **8.4.1. Identifying the Round 1 baseline**

Based on the GIS dataset, which was ultimately used to define the Round 1 baseline AQMAs, there were 158 AQMAs in 83 local authorities that had been declared for predicted exceedences of the annual mean nitrogen dioxide objective in England. This represents 26% of all England local authorities (excluding London) at that time. The distribution of these AQMAs is geographically diverse, but with a tendency to be focused around urban areas or motorways. There is also huge diversity in the size and number of AQMAs declared for nitrogen dioxide in each local authority. The majority had declared a single AQMA, but more than one third had declared two or more and 8% declaring six or seven AQMAs. Some AQMAs appear to be based on a single area of predicted exceedence, while others have been extended to cover the road network or an urban centre. Two of these single local authorities had declared AQMAs covering the whole of their administrative areas, the largest of which covers ~268 km<sup>2</sup>, but 78% of AQMAs were smaller than 1 km<sup>2</sup> – the total area of all of the Round 1 baseline AQMAs was ~694 km<sup>2</sup>. The implications for this diversity in AQMA sizes and numbers

for the methodology employed in this research is that so-called “representative” monitoring stations, as defined by the distance criteria, may not be representative of the exceedance area at all. An example of this is Birmingham City Council, which has declared a “whole-borough” AQMA and represents the largest AQMA in the dataset. Given its size, there may be a number of monitoring sites within the specified distances to constitute representivity, but it is unlikely that the whole of Birmingham is actually exceeding. Having declared such a large AQMA, Birmingham City Council AQAP may include measures that are targeted at reducing nitrogen dioxide concentrations across the whole area, in which case the representivity of the monitoring sites may be valid, but if measures are more targeted at actual areas of exceedance then concentrations of nitrogen dioxide at the monitoring sites may not be affected. This underpins two crucial assumptions in the methodology: that AQMAs reflect the areas of exceedance and that AQAP measures will be targeted at the AQMA.

#### **8.4.2. Compliance with AQMAs/local authorities selection criteria**

##### **8.4.2.1. Criterion 1: Compliance with Action Plan Progress Reporting requirements**

Of the 83 Round 1 baseline local authorities, 55 (66%) of them met the Criterion 1 requirements, i.e. AQAPs published pre-1/1/2006 and revised AQAPs, AQAP PRs or USAs containing AQAP PRs published in 2009 or later; 70 (84%) of them had met the first part of Criterion 1, i.e. published AQAPs before 1/1/2006, while 64 (77%) of them complied with the second part of Criterion 1, i.e. AQAP PRs published after 2008. AQAPs had been obtained for all but one of the local authorities and the modal year identified as 2004 leading to the AQAP cut-off date of <1/1/2006 being devised to maximise the sample size. Although the *Environment Act* (1995) does not prescribe any timetable for preparing an AQAP, the 2000 update of the statutory guidance (LAQM.G2(00)) states that AQAPs are expected to be completed within 12-18 months of designation of the AQMA. Of the 83 Round 1 baseline local authorities, 77 (84%) of them had declared their AQMA for nitrogen dioxide annual mean before 30<sup>th</sup> June 2004, i.e. 18 months prior to the AQAP cut-off date used in this research. Only 7 (8%) local authorities in this sample therefore had AQAPs outstanding which should have been completed by the cut-off date (including the one AQAP that was not obtainable). The 2003 statutory guidance (LAQM.PG(03)) requires all local authorities to produce annual AQAP PRs, however no AQAP PRs at all were available for 11 local authorities, only one of which (Oadby & Wigston District Council) was identified that had completely revoked its AQMAs in April 2008 (though not apparently due to AQAP implementation). For two of these local authorities (Oswestry Borough Council and



Shrewsbury & Atcham Borough Council) no Review and Assessment reports were available either<sup>23</sup>. For all local authorities in the sample AQAP PR submission was sporadic with the number of AQAP PRs submitted lagging behind Review and Assessment reporting, particularly in a year when Updating and Screening Assessment were due (Figure 7.6, p. 83). For the majority of local authorities in this sample, AQAP and AQAP PR submission rates were good, and this Criterion is not considered to have been a significantly limiting factor in the sample selection process; however, there does appear to be a tendency for under-reporting of AQAP progress, which does not appear to have been successfully challenged by Defra. This is an important point with implications for the effectiveness of LAQM to be able to contribute towards achieving selected EU limit values, as without adequate reporting on the implementation of AQAPs, neither local authorities nor Defra demonstrate that action is being taken to improve air quality locally.

#### **8.4.2.2. Criterion 2 & 3: Compliance with monitoring data and siting requirements (AURN)**

Of the 178 current and historical AURN sites for which data was available from the Defra AURN website, only 77 (43%) met the Criterion 2 data capture requirements, i.e. annual data capture >75% and data capture 2005-2012 >75%. Of these 77 AURN sites, only 51 (29% of the total) were either Traffic Urban (16) or Background Urban (35) sites that could be used for this research, the remaining sites representing Background Rural (13), Background Suburban (6) and Industrial Urban (6) (Figure 7.8). Of these, only two Traffic Urban sites (Figure 7.10) and 27 Background Urban sites (Figure 7.11) were representative of Round 1 baseline AQMAs that had met Criterion 1, and only one AQMA (Bristol AQMA) met all three criteria for both Traffic Urban and Background Urban sites using the AURN (Figure 7.12).

Data capture is clearly a significant limiting factor in this research methodology and was somewhat surprising given that the AURN are used for compliance assessment reporting to the EC with 118 NO<sub>2</sub>/NO<sub>x</sub> sites in place pre-2012 (Connolly and Kent, 2013). It does, however, demonstrate Defra's reliance on supplementary assessment modelling (Carslaw, Williams and Stedman, 2013). Furthermore, five of

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<sup>23</sup>These two local authorities had been subsumed within Shropshire Unitary Authority in the 2009 local government restructure and no air quality reports have been made available on the new website, although they can be obtained via an Environmental Information Request at a charge of £67.75 per hour (<http://www.shropshire.gov.uk/environmental-health/environmental-protection-prevention/environmental-information-requests/>).



these sites had not met the EU siting criteria specified in the AAQD 2008/50/EC (Eaton, 2010).

Defra have just announced an expansion of the AURN with an additional 44 new station locations (and one relocation) for nitrogen dioxide planned over the next few years (Connolly and Kent, 2013), in accordance with the 2011 Commission Implementing Decision on the reciprocal exchange of information and reporting on ambient air quality (2011/850/EU). While it is recognised that this is a relatively small number of additional monitors<sup>24</sup>, if these sites could be located with consideration of representing concentrations in existing AQMAs, LAQM may be better placed to support Defra in its achievement of the nitrogen dioxide limit value.

#### **8.4.2.3. Criterion 2 & 3: Compliance with monitoring data and siting requirements (local authority monitors)**

Of the 185 local authority monitors, 83 Traffic Urban sites and 50 Background Urban sites were found to meet the Criterion 3 siting requirements. Accounting for only those AQMAs that met Criterion 1, there were 59 Traffic Urban sites and 42 Background Urban sites that met the Criterion 3 siting requirements, representing 34 AQMAs across 25 local authorities. Applying the Criterion 2 data capture requirements, however, reduced this to 22 Traffic Urban sites and 10 Background Urban sites.

Although AURN monitors have been prioritised in this research, as these form part of Defra's compliance assessment reporting to the EC and therefore have specific relevance for the research statement, local authority monitors are more representative of the AQMAs, being operated specifically for LAQM purposes. In its recent LAQM consultation, Defra accurately, though rather disingenuously, stated that local authorities are not statutorily obliged to undertake monitoring for LAQM. They are, however, required to Review and Assess air quality in their jurisdictions and without robust monitoring many pollution hotspots would not have been identified. Furthermore, without monitoring it is impossible to assess whether implementation of AQAPs is having any effect on local pollutant concentrations. Most local authorities favour passive diffusion tube monitoring due to resource limitations, but, as previously discussed, the high level of uncertainty and variability in this monitoring method is not adequate for reporting to the EC. With coordinated effort and greater investment from

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<sup>24</sup> Research has indicated that 9,000 monitoring sites would be required in order to replicate the UK assessment outcome based on monitoring alone, although the AAQD requires a minimum of only 153 sites to replace supplementary assessment (Carslaw, Williams and Stedman, 2013)

Defra in continuous monitoring with local authorities, sites could be established that meet the purposes of both LAQM and compliance assessment reporting to the EC, enabling local authorities to operate robust monitoring over longer time periods in order to identify local trends.

#### **8.4.3. Summary of compliance with AQMAs/local authorities selection criteria**

The key finding from this section of the research is a confirmation of the thesis statement, i.e. that currently LAQM is not a successful strategy in achieving selected EU limit values. An absence of adequate AQAP progress reporting and representatively sited robust monitoring data indicate that, collectively, the means to assess the effectiveness of LAQM does not currently exist.

Only a small selection of eight AQMAs in six local authorities was found to have sufficient data available to be able to make this assessment. The following section critically discusses whether, using this data for these case study local authorities, this research has been able to demonstrate, individually, whether implementation of AQAPs can be associated with a reduction in local nitrogen dioxide concentrations, and, if so, what this reveals for the effectiveness of LAQM in these cases.

#### **8.4.4. Case studies**

The case study local authorities and their AQMAs are as follows:

- Barnsley Metropolitan Borough Council (Barnsley AQMA)
- Bristol City Council (Bristol AQMA)
- Leicester City Council (Leicester AQMA)
- Oxford City Council (Oxford AQMA)
- Sandwell Metropolitan Borough Council (Great Barr NW, Great Barr South, Great Barr SW)
- City of York Council (York AQMA)

Each of the case studies is critically discussed in turn with reference to the nature of the local authority, AQMA and monitoring sites together with the monitoring data and AQAPs.

##### **8.4.4.1. *Barnsley Metropolitan Borough Council (Barnsley AQMA)***

As one of two Metropolitan Borough Councils in the case study cohort, Barnsley MBC effectively operates as a single-tier authority, but with the South Yorkshire Integrated Transport Authority providing a coordinated basis for county-wide transport planning.

AQMA 1 was declared along approximately 16 km of the M1 in 2001 on the basis of predicted exceedences of the annual mean nitrogen dioxide objective at two receptors in Dodworth using diffusion tube monitoring and dispersion modelling. The main sources were traffic on the M1 and A628 access route, primarily Heavy Goods Vehicles.

There was one Background Urban (AURN) site (Barnsley Gawber) and one Traffic Urban (local authority) site (Barnsley A628 Roadside) that were within the requisite distances of the Barnsley AQMA. The Traffic Urban site was located approximately 400 m outside of the AQMA on the busy Pogmoor Crossroads junction of the A628 Dodworth Road, A6133 Broadway and Pogmoor Road. This location actually forms part of a subsequent AQMA (AQMA 2A) and may, therefore, be considered to be more representative of concentrations in AQMA 2A than AQMA 1. The Background Urban site is located in a residential area, approximately 290 m away from any direct road source and approximately 1.3 km from both the AQMA 1 and the Traffic Urban site, so is considered to be representative of background concentrations.

Although no significant trend was identified for NO<sub>2</sub> concentrations at the Background Urban site, there was a significant reduction in concentrations at the Traffic Urban site ( $\hat{\beta} = -0.798$ ,  $t = -3.253$ ,  $df = 6$ ,  $p = 0.017$ , two-sided) falling from 47 µg/m<sup>3</sup> in 2004 to 41 µg/m<sup>3</sup> in 2011, resulting in a reduction in local contribution NO<sub>2</sub> of 4 µg/m<sup>3</sup> over the same period.

Barnsley MBC produced a draft AQAP in July 2003, a final AQAP in October 2004, an LTP with integrated AQAP in 2005/6 and an updated AQAP in 2010. As at 2012, nine measures were considered completed, 18 were ongoing and seven were no longer reported or abandoned. The only completed measure that was specifically relevant to the Traffic Urban site was the implementation of 'Barnsley Intelligent Transport Systems', with the alteration of the MOVA (Microprocessor Optimised Vehicle Actuation) and SCOOT (Split Cycle and Offset Optimisation Technique) traffic signal controls at the A628 Dodworth Road/Broadway junction in 2010. There was a notable reduction in local contribution NO<sub>2</sub> in 2010, but this appears to be more related to elevated Background Urban concentrations relative to the Traffic Urban site than the implementation of the AQAP measure, although concentrations at the Traffic Urban site were slightly lower in 2010 and 2011. To the west of the M1 on the A628, the creation of the Dodworth bypass in 2006/7 appears to have directly led to the revocation of AQMA 2B. Given the role of the Highways Agency in managing trunk roads, Barnsley MBC discussed a range of AQMA 1 specific measures with them, however only the

Dodworth bypass was implemented, with the Highways Agency arguing that the remaining seven options were not cost-effective on the basis that NO<sub>2</sub> concentrations were predicted to decrease below the objective level by 2007. These predictions proved to be optimistic, but diffusion tube monitoring in AQMA 1 has now indicated that NO<sub>2</sub> concentrations have fallen below the annual mean objective. With no clear cause, however, no revocation has yet been sought for this AQMA. It is not clear whether either of the measures mentioned in AQMA 2A or AQMA 2B may have contributed, but no other AQAP measures implemented are considered likely to have had any direct effect.

In summary, using this methodology for Barnsley MBC, it has not been possible to link implementation of AQAP measures with any reduction in concentrations of nitrogen dioxide in the original AQMA 1. This is not necessarily because AQAP measures have not contributed to improvements in air quality; on the contrary, according to the local authority's Review and Assessment reports concentrations of nitrogen dioxide have now fallen below the objective level in AQMA 1, although this has not been attributable to any specific AQAP measures. Although the Traffic Urban monitor is located within 0.5 km of AQMA 1, it is more heavily influenced by traffic on the A628 rather than the M1, and as a result is more representative of the subsequently declared AQMA 2A. Calculated local nitrogen dioxide concentrations at this site have fallen slightly over the period 2004-2011, but, again, it is difficult to attribute this to any specific AQAP measures, the only measure that would have been likely to have had any direct impact having only been implemented in 2010. According to the local authority's reports, implementation of the AQAP has directly resulted in the revocation of another AQMA (AQMA 2B) with the construction of the Dodworth bypass. Other than this measure, however, the cooperation from the Highways Agency appears to have been limited. Later reports have suggested that the Highways Agency continue to be involved in air quality management on the M1 through regional fora, but it is not clear how effective these discussions have been.

#### **8.4.4.2. Bristol City Council (Bristol AQMA)**

As a Unitary Authority, Bristol City Council also operates as single-tier authority, but has retained links with its former-Avon neighbouring authorities in developing Joint Local Transport Plans. The original AQMA was declared in 2001 and covered the City Centre, including major radial roads, and Avonmouth Docks (M5/M49 junction), though the Avonmouth section was revoked in 2008 so this research has focused on the City Centre. The primary emissions source was cars and taxis, due to their high contribution to traffic volume.

There were two Background Urban sites (Bristol St Paul's (AURN) and Brislington Depot (LA), and seven Traffic Urban sites (Bristol Old Market (AURN), Newfoundland Way Police Station (LA), Bath Road (LA), Parson Street School (LA), Shiner's Garage (LA), Wells Road (LA) and Rupert Street (LA)) that were within the requisite distances of the Bristol AQMA. To ensure consistency across all sites, only the St Paul's (AURN) Background Urban site was used to calculate the local contribution NO<sub>2</sub> at each Traffic Urban site as there was concern that the Brislington Depot site may have been unduly influenced by a nearby heavily-trafficked road. Bristol Old Market (AURN) did not meet the EU siting criteria as it was situated on a major road junction and so monitoring ceased in January 2013. The Newfoundland Way Police Station site and Bath Road site were installed to measure the impact of specific developments and so may not be best placed to assess the impact of AQAP measures, although Bath Road was representative of traffic flows on the A4 until monitoring ceased here in January 2013. The Shiner's Garage site was specifically installed to assess the impact of the A420 bus showcase route and ceased monitoring in January 2013. Rupert Street was categorized by the local authority as an Urban Centre site (representative of Background Urban concentrations), but it is actually more representative of a Traffic Urban site. This is a case of local authority site type classifications differing, or being less rigorous than EU site type classifications used by the AURN, and hence a source of confusion in identifying appropriate sites on this basis.

There no significant trend in nitrogen dioxide concentrations at the St Paul's Background Urban site over the period 2007-2012; although low concentrations were measured in 2011, concentrations in 2012 were as high, or higher, than in preceding years. At the Bristol Old Market site, total NO<sub>2</sub> concentrations increased 2004-2010, which is reflected in the local contribution NO<sub>2</sub> at this site during 2007-2010. The Bath Road site has seen marginal decrease in total NO<sub>2</sub> concentrations 2007-2012, which was also observed in local NO<sub>2</sub> over the same period. At Newfoundland Way Police Station total NO<sub>2</sub> concentrations between 2005 and 2012 began falling in 2010 resulting in an overall decrease in local NO<sub>2</sub> at this site 2007-2012. Total NO<sub>2</sub> concentrations at Parson Street School have remained relatively stable 2005-2012 with a slight decrease in 2011-2012. The resulting local NO<sub>2</sub> concentrations also saw a very slight decrease 2007-2012. At Shiner's Garage total NO<sub>2</sub> concentrations have remained relatively stable 2005-2012 with a very slight increase in local NO<sub>2</sub> 2007-2012. At Wells Road total NO<sub>2</sub> concentrations have shown a significant downward trend ( $\hat{\beta} = -1.377$ ,  $t = -3.572$ ,  $df = 5$ ,  $p = 0.016$ , two-sided), resulting in a significant downward trend in local NO<sub>2</sub> concentrations 2007-2012 ( $\hat{\beta} = -1.743$ ,  $t = -2.997$ ,  $df = 4$ ,

$p = 0.040$ , two-sided). At Rupert Street total  $\text{NO}_2$  was increasing 2004-2008 but subsequently begun to fall. The downward trend in local  $\text{NO}_2$  concentrations at this site 2007-2012 was the most significant ( $\hat{\beta} = -2.857$ ,  $t = -5.283$ ,  $df = 4$ ,  $p = 0.006$ , two-sided).

Bristol City Council submitted a draft AQAP as part of their LTP in July 2000 and a final AQAP in April 2004, which included measures supplementary to the LTP. Progress on measures included within the LTP was difficult to follow, but of the supplementary measures in the AQAP only one (M32 Management) was considered completed by 2013, 21 were ongoing and eight were no longer reported or abandoned. There was also significant progress made on some of the ongoing measures: take-up of Travel Plans by 96% of LEAs in the AQMA; delivery of £22 million Cycling City Project; establishment of a Freight Consolidation Centre Scheme serving Bristol and Bath; and the introduction of an Enhanced Traffic Control Centre. There were also a number of site-specific measures implemented, including Showcase Bus Routes on the A420 corridor (completed 2007), A370 GBBN route, A432 Fishponds Road, A4018 and A4 Bath Road corridors (completed March 2012).

The implementation of the M32 Management measure with bus lane and speed restrictions in 2009 may have resulted in the reduction of  $\text{NO}_2$  concentrations at Newfoundland Way Police Station. Road and junction bus prioritisation improvements as part of the Greater Bristol Bus Network (GBBN) scheme were completed on the A4 Bath Road corridor in 2012 and may have contributed to the latter reduction in  $\text{NO}_2$  concentrations at this site. Similarly, GBBN changes to the Parson Street Gyration which were completed in March 2012 may have caused the slight decrease in  $\text{NO}_2$  concentrations at the Parson Street School site. GBBN corridor works completed on the A420 corridor in 2007 do not appear to have had an immediate positive impact on  $\text{NO}_2$  concentrations at the Shiner's Garage site, at which local concentrations continued to increase before falling in 2012. The same applies to Bristol Old Market, located at the bottom of the A420, although this site did not meet the EU siting criteria. Both of these sites were discontinued in January 2013. The significant reduction in  $\text{NO}_2$  concentrations at the Rupert Street site may have been influenced by the introduction of the Enhanced Traffic Control Centre and knock-on effects from the M32 management both potentially reducing congestion in the area. There are no measures that can explicitly be associated with the significant downward trends in annual mean  $\text{NO}_2$  concentrations recorded at the Wells Road site.

In summary, the distribution of Traffic Urban monitoring sites across Bristol City Centre has presented an informative representation of the variability of NO<sub>2</sub> concentrations and trends in this urban area. They have also enabled some insight into the impacts of some of the site-specific measures implemented (or part-implemented) in the AQAP. The findings have been conflicting in some cases, with decreasing concentrations associated with improvements to the GBBN in some areas, but not others (e.g. A420 route), suggesting that there may be other confounding factors affecting these sites – unfortunately, since both the Shiner's Garage and Bristol Old Market sites have since been discontinued, continued assessment of this situation is not possible at these locations. The M32 Management also appears to have had a beneficial impact on NO<sub>2</sub> concentrations where it enters the city, but there are numerous non-site specific measures, and measures included exclusively in the LTP that may have contributed to improvements in air quality across the City Centre and Greater Bristol Area. Air quality and transport planning appear to have been well-integrated with the publication of Joint-LTPs providing a coordinated approach to both transport and air quality management across Bristol and its neighbouring authorities.

#### **8.4.4.3. Leicester City Council (Leicester AQMA)**

Leicester City Council is a Unitary Authority operating as a single-tier. It declared its AQMA at the end of 2000 covering the City Centre and its radial road network in a similar way to Bristol CC's City Centre AQMA. The main source of NO<sub>x</sub> emissions was identified as Heavy Duty Vehicles, like Barnsley MBC.

There was one Background Urban site (Leicester Centre (AURN)) and eight Traffic Urban sites (Glenhills Way (LA), Abbey Lane (LA), Melton Road (LA), St Matthews Way (LA), Imperial Avenue (LA), Uppingham Road (LA), Vaughan Way (LA) and London Road (LA)) that were within the requisite distances of Leicester AQMA. The Leicester Centre (AURN) Background Urban site may not be representative of background concentrations of NO<sub>2</sub> as it did not meet the EU siting criteria and is also located 30 m from a heavily trafficked street which is subject to peak-period congestion. As the only Background Urban site, however, it was used to calculate the local contribution NO<sub>2</sub> at each Traffic Urban site. The London Road, Abbey Lane and Melton Road sites were installed specifically to assess proposed traffic schemes. Uppingham Road is a continuation of the Humberstone Road Quality Bus Corridor (which was due for implementation in 2008/09). The Vaughan Way site was installed to assess the impact of the Highcross retail development. The Imperial Avenue site is located just off a busy junction on a quieter one-way street.



There was no significant trend in NO<sub>2</sub> concentrations at the Leicester Centre (AURN) Background Urban site but concentrations were generally decreasing 2004-2012 (missing 2011), with unusually elevated concentrations in 2010. At the Abbey Lane site total NO<sub>2</sub> concentrations have been relatively static overall 2004-2011, but with increasing concentrations in 2009 and 2010. Local NO<sub>2</sub> concentrations at this site showed a significant upward trend 2004-2010 ( $\hat{\beta} = 1.929$ ,  $t = 3.143$ ,  $df = 5$ ,  $p = 0.026$ , two-sided). The Glenhills Way site shows a similar pattern with increasing concentrations of total NO<sub>2</sub> to 2010, falling in 2011. Local contribution NO<sub>2</sub> concentrations at this site 2004-2010 were also increasing though not significantly. Total NO<sub>2</sub> concentrations at the Imperial Avenue site have been stable 2004-2011, but concentrations are low relative to the Background Urban site, reflecting its location away from the busy junction. This has resulted in some negative local NO<sub>2</sub> concentrations being calculated 2004-2010.

A similar situation is apparent at the London Road site, which, although heavily-trafficked is relatively free-flowing and wide. Here, total NO<sub>2</sub> concentrations have also been low compared with Background Urban concentrations. Calculation of local contribution NO<sub>2</sub> at this site has also resulted in negative concentrations. Total NO<sub>2</sub> concentrations at the Melton Road site showed a similar pattern to Glenhills Way and Abbey Lane, increasing 2004-2010 and then falling in 2011. The resulting local contribution NO<sub>2</sub> concentrations have followed the same pattern, accentuated by the elevated Background Urban concentrations in 2010. At the St Matthews Way site total NO<sub>2</sub> concentrations fluctuated over the period 2004-2011 but remained stable overall. The resulting local NO<sub>2</sub> concentrations at this site have shown a slight decrease 2004-2010. Total NO<sub>2</sub> concentrations at the Uppingham Road site, similarly to those at London Road and Imperial Avenue, are low relative to the Background Urban concentrations 2004-2011. Calculated local NO<sub>2</sub> concentrations at this site are therefore also low, and negative in 2010 where they correspond with the elevated Background Urban concentrations. At the Vaughan Way site there was a significant increase in total NO<sub>2</sub> concentrations 2006-2011 ( $\hat{\beta} = 3.886$ ,  $t = 4.639$ ,  $df = 5$ ,  $p = 0.010$ , two-sided) however the trend in local contribution NO<sub>2</sub> 2006-2010 was not significant.

Leicester City Council submitted a draft AQAP in May 2004, a final AQAP four months later, an LTP2 AQAP in 2005 and an LTP3 AQAP in 2011. Progress on the AQAP measures were not included in either the 2009 LTP2 Progress Report or the LTP3 AQAP. Due to the absence of progress reporting it is difficult to identify whether any of the AQAP measures have been implemented. No site-specific measures were identified, despite the inclusion of monitoring stations specifically to assess the impact



of proposed traffic schemes. A number of measures that had been identified as having the potential to reduce NO<sub>2</sub> concentrations at some of the worst monitoring sites, but had been considered not to be feasible or cost-effective in the LTP2 AQAP, were being reconsidered in the LTP3 AQAP.

In summary, the methodology has been difficult to implement in the case of Leicester City Council. Despite having a high number of Urban Transport monitoring sites distributed across the main radial routes of the city, the calculation of the local contribution NO<sub>2</sub> has been called into doubt due to the unrepresentativeness of the Background Urban site. In addition, it has been difficult to extract information on the implementation of AQAP measures due to an absence of published progress data and therefore impossible to link trends in NO<sub>2</sub> concentrations to implementation of the AQAPs. Other than the fact that the AQAPs and LTPs have been integrated, there does not appear to be any clear advantage for air quality in Leicester operating as a single-tier authority.

#### **8.4.4.4. Oxford City Council (Oxford AQMA)**

Oxford City Council is the only two-tier authority in this case study cohort and therefore does not have direct control over transport planning or policy, which is the responsibility of Oxfordshire County Council. The AQMA was originally declared in September 2001 and included the main City Centre roads only, though this was expanded to include the whole jurisdiction of Oxford City Council in 2010. The main contributor to NO<sub>x</sub> emissions was buses and other HDVs, like Barnsley MBC and Leicester CC, with poor air quality exacerbated by congestion, canyon streets and topography.

There was one Background Urban site (Oxford St Ebbe's (AURN- affiliated)) and two Traffic Urban sites (Oxford Centre Roadside/St Aldate's (AURN) and High Street (LA)) that were within the requisite distances of the Oxford AQMA. The Background Urban site is located away from any direct source and is considered to be representative of background concentrations. The local authority had classified both St Aldate's and High Street as Urban Centre sites as well as referring to them as Roadside sites. This is another case of local authority interpretations of site type classifications differing from those used by Defra in reporting AURN data to the EC. Oxford City Council's use of St Aldate's as the site name for Defra's Oxford Centre Roadside site was also an initial source of confusion.

NO<sub>2</sub> concentrations at the Oxford St Ebbe's AURN-affiliated Background Urban site were variable for the period 2005-2011, but generally stable overall with no significant trend. There was also no significant trend in total NO<sub>2</sub> concentrations at either the

Oxford Centre Roadside/St Aldate's site or High Street. Annual mean concentrations at Oxford Centre Roadside/St Aldate's decreased 2004-2009 but steadily increased subsequently up to 2012. Local contribution NO<sub>2</sub> concentrations for this site followed the same pattern for the period 2005-2011. Total and local contribution NO<sub>2</sub> concentrations at the High Street site 2005-2011 were variable.

Oxford City Council submitted a draft AQAP in July 2005, a final AQAP in April 2006, which was integrated into LTP2, and a second AQAP, to be integrated into LTP3, in July 2013. Only two measures were reported to have been implemented within the monitoring period: Bus Gate Enforcement (February 2007) and Statutory Engine Switch-Off (March 2008). The Bus Gate Enforcement was specific to High Street and, although reportedly resulting in a decrease in traffic volume, this does not appear to have directly translated to air quality improvements, with higher NO<sub>2</sub> concentrations recorded at this site since its implementation. Similarly, since the implementation of the Statutory Engine Switch-Off measure, NO<sub>2</sub> concentrations at Oxford Centre Roadside/St Aldate's have also increased. There are no other measures that can be directly associated with these sites.

In summary, although the methodology was successfully implemented in this case, it was not possible to associate implementation of any AQAP measures with reductions in NO<sub>2</sub> concentrations in the Oxford AQMA, despite measures being implemented that would have been expected to have had an impact. There are clearly confounding factors and other influences or issues affecting NO<sub>2</sub> concentrations at both of these sites, which could not be determined from the available reports. Oxford has had a progressive approach to transport planning for many years with the Balanced Transport Strategy in 1973 introducing Park and Ride, the Oxford Transport Strategy in 1999 and the voluntary Bus Quality Partnership in 1998. There have also been conflicts between air quality and transport policies, for example the reduced city centre speed limit from 30 mph to 20 mph on road safety grounds although this was predicted to increase NO<sub>x</sub> emissions within the AQMA by 27%. Also, the LTP2 air quality indicator was set well above the national air quality objective with targets of 64 µg/m<sup>3</sup> in 2006 reducing to only 56 µg/m<sup>3</sup> by 2011; the 2013 AQAP (which is to be integrated into LTP3) has also set false targets of at least 45 µg/m<sup>3</sup> by 2020 and 40 µg/m<sup>3</sup> by 2025 at the latest. These targets are not aligned to the EU limit value indicating that Oxford City Council does not consider that local action can successfully contribute to meeting the AAQD.

#### **8.4.4.5. Sandwell Metropolitan Borough Council (Great Barr NW, Great Barr South, Great Barr SW)**

Sandwell MBC, like Barnsley MBC, effectively operates as a single-tier authority, with input into the West Midlands Integrated Transport Authority, Centro. Sandwell is highly urbanised and is also traversed by the M5 and M6 motorways. Sandwell MBC declared six AQMAs in August 2002, three of which are used in this research. Great Barr NW, Great Barr South, Great Barr SW AQMAs are adjacent to the M6 Junctions 7 and 8 and influenced by the M5 East Link and A34. Also like Barnsley MBC, this case study represents a motorway-based AQMA, but whereas Barnsley AQMA represents the linear route of the motorway, including representative public exposure within its breadth, the Great Barr AQMAs do not include the motorway, representing only the adjacent areas where relevant public exposure exists. Like Oxford AQMA, Sandwell expanded its AQMA to include the whole borough, but subsequent to the data selection for this research.

There was one Background Urban site (Sandwell West Bromwich (AURN)) and one Traffic Urban site (Wilderness Lane (Great Barr)) that were within the requisite distances of the Great Barr NW, Great Barr South, Great Barr SW AQMAs in Sandwell MBC. The Background Urban (AURN) site was located on the roof of the Council offices' car park and was closed at the end of 2011 having been judged not to meet the EU siting criteria (Eaton, 2010). It was located within the commercial centre of West Bromwich, almost 5 km from the Traffic Urban monitor, and so may not be considered to be representative of background concentrations of NO<sub>2</sub> relevant to the AQMAs. The Traffic Urban site is located 50 m north of the M6 on a quiet road that runs beneath the motorway. Although this site is within 0.5 km, and relatively central to all three AQMAs, it may also not be considered to be particularly influenced by the motorway traffic and may not therefore be considered strictly representative.

No significant trends in annual mean concentrations of NO<sub>2</sub> were observed at either the Sandwell West Bromwich (AURN) Background site or the Wilderness Lane (Great Barr) Traffic Urban site 2004-2010. Sandwell MBC produced an interim draft AQAP in February 2005; a new draft AQAP was published for consultation in July 2007, and was submitted as a final AQAP in September 2009. By 2010 (the latest available update) 12 AQAP measures (including ten site-specific) had been completed, 23 measures had not been implemented and 18 measures were ongoing. Of the completed measures, three were relevant to the Great Barr AQMAs and were implemented within the monitoring period. These are: Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24

hours a day, seven days a week – Completed 2006; An improved system of contingency planning for the motorway network has been implemented to improve traffic flows – Completed 2006; and Route 51 improvements – a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards – Completed 2008. While these measures may have had an influence on local concentrations of NO<sub>2</sub>, the unrepresentativeness of the monitoring sites calls the calculation of the local contribution NO<sub>2</sub> concentrations into question.

In summary, using the methodology it has not been possible to state with any confidence that AQAP measures have influenced local concentrations of NO<sub>2</sub> due to uncertainty regarding the monitoring sites, which, although within the requisite distances may be more or less influenced by their specific locations than representative of the AQMAs. This example demonstrates that although distances may be used to select Background Urban and Traffic Urban sites, their representativeness of concentrations with regards to the AQMA must be decided on a case-by-case basis. It also serves to demonstrate the argument that there are insufficient monitoring sites currently available to enable an assessment of NO<sub>2</sub> concentrations in AQMAs, particularly those associated with motorways (see Barnsley case study as another example where continuous monitoring was not considered representative of the M1 AQMA).

#### **8.4.4.6. City of York Council (York AQMA)**

City of York Council operates as a single-tier Unitary Authority. The Council declared its AQMA in January 2002 covering the City Centre's inner ring roads and radial routes only, similar to the original Oxford AQMA. HGVs and cars were found to be the main contributors to NO<sub>x</sub> emissions. Two further AQMAs have subsequently been declared on the basis of new areas of exceedence and the City Centre's AQMA has also been expanded to account for breaches of both the annual and hourly mean objective for NO<sub>2</sub>.

There was one Background Urban site (Bootham) and six Traffic Urban sites (Fishergate, Lawrence Street, Nunnery Lane, Gillygate, Holgate Road and Heworth Green) that were within the requisite distance of the York AQMA. All sites were local authority run. The Background Urban Bootham site is located away from any direct source of NO<sub>2</sub> and is therefore considered to be representative of background

concentrations relevant to the AQMA. All Traffic Urban sites are also considered to be representative of roadside concentrations within the AQMA.

Background Urban concentrations of NO<sub>2</sub> 2004-2012 have increased since 2007, remaining relatively static thereafter, leading to a significant upward trend ( $\hat{\beta} = 0.617$ ,  $t = 2.541$ ,  $df = 7$ ,  $p = 0.039$ , two-sided). Total NO<sub>2</sub> concentrations at the Fishergate site were relatively stable, although there were elevated concentrations in 2009 and 2010. Local contribution NO<sub>2</sub> concentrations at this site were generally decreasing overall. At Gillygate, total NO<sub>2</sub> concentrations were increasing 2004-2011, but decreased substantially in 2012. The local contribution NO<sub>2</sub> concentrations at this site were slightly increasing. At Heworth Green, total concentrations of NO<sub>2</sub> have been variable, but generally increasing 2006-2012, which is also reflected in the local NO<sub>2</sub> concentrations. At Holgate total concentrations of NO<sub>2</sub> have generally fallen 2004-2012 (missing 2008), and local contributions of NO<sub>2</sub> have also fallen. At Lawrence Street, total NO<sub>2</sub> concentrations 2004-2012 (missing 2009) were slightly decreasing, with a significant downward trend in local contribution NO<sub>2</sub> at this site ( $\hat{\beta} = -0.943$ ,  $t = -2.681$ ,  $df = 6$ ,  $p = 0.037$ , two-sided). Total NO<sub>2</sub> concentrations at Nunnery Lane 2004-2012 were variable but generally increasing, whereas concentrations of local contribution NO<sub>2</sub> slightly decrease overall.

City of York Council submitted its first AQAP in July 2004 and a second AQAP as an Annex to its LTP2 in April 2006. As at April 2013, 27 measures were completed; seven were on-going and six were not implemented. Of the completed measures, very few were location-specific. Two exceptions were AP35: Introduce bus priority measures on A19 (complete 2011), which would have been most likely to have affected the Fishergate site, and AP46: Complete ORR upgrading works at Hopgrove Roundabout and Moor Lane (completed 2009), which was closest to Heworth Green. The fact that concentrations of NO<sub>2</sub> fell at Fishergate in 2011 following completion of the bus priority measures may indicate that this measure has had a positive impact of air quality; or it may suggest that concentrations were returning to normal after two years of congestion during their installation had inflated local concentrations of NO<sub>2</sub> in 2009 and 2010. The ORR (outer ring-road) upgrading works do not appear to have improved air quality at Heworth Green with local concentrations of NO<sub>2</sub> higher than before completion. The introduction of FTR buses on Route 4 in May 2006 may have led to temporary improvements in NO<sub>2</sub> concentrations at Gillygate and Holgate in 2007, however concentrations at Gillygate have subsequently increased, perhaps due to the added congestion that the FTR buses were reported to have caused before their discontinuation in 2012. No other measures implemented were either in place before

2012 or were considered to have had a specific effect on concentrations at any monitoring site. It is not clear why there was a significant reduction in local concentration NO<sub>2</sub> at Lawrence Street.

In summary, despite the wide distribution of monitoring sites across the AQMA, it has been difficult to attribute the implementation of any AQAP measures to reductions in local NO<sub>2</sub> concentrations. This is partly due to the fact that there were few location-specific measures, however, those that were did not appear to have had any substantial or lasting impact on local NO<sub>2</sub> concentrations, suggesting that either the AQAP measures have failed in their attempt to reduce pollution in the AQMA, or that the monitoring sites are not well-placed to assess the impacts of those measures. This is a similar observation to that made in the Oxford AQMA, where implemented AQAP measures did not appear to result in reduced local NO<sub>2</sub> at either of the Traffic Urban sites. These examples highlight the importance of locating monitoring sites in areas that are representative of the AQMA (which these sites were considered to be), but also in ensuring that AQAP measures are targeted at improving air quality within the AQMA.

#### **8.4.4.7. Summary of case studies**

In all of the case studies it has been difficult to link implementation of AQAP measures with reductions in local contribution NO<sub>2</sub>. There have been various individual reasons and combinations of reasons for this in the different case study local authorities.

Representativeness of monitoring sites has been a recurrent theme with the Traffic Urban site in Barnsley AQMA, the Background Urban site in Leicester AQMA and both Traffic Urban and Background Urban sites in the Sandwell (Great Barr) AQMAs not considered to be representative of their respective AQMAs, despite meeting the Criterion 3 siting requirements. This highlights the need to consider the siting of monitoring stations on a case-by-case basis to ensure that they are representative of the AQMAs, given that AQMAs are representative of areas of exceedence.

Even where sites were considered to be representative, it was often difficult to show that implemented measures had had any positive impact on local NO<sub>2</sub> concentrations. Traffic Urban sites in Oxford AQMA and York AQMA were not able to detect improvements in local NO<sub>2</sub> despite the implementation of AQAPs which would have been expected to have had a direct impact on concentrations within the timescale under consideration. In Leicester AQMA, it was an absence of AQAP progress reporting that meant implementation of measures could not be determined.

Some successful measures were identified, even if not directly related to the original Round 1 baseline AQMAs. The construction of the Dodworth bypass in Barnsley, for instance, was reported to have led to the direct revocation of the AQMA 2B; a rare example of an AQAP leading to an NO<sub>2</sub> AQMA revocation (Moorcroft and Dore, 2013). The implementation of the Greater Bristol Bus Network improvements may also have been associated with reductions in local NO<sub>2</sub> concentrations at two sites in the Bristol AQMA, if not along the A420 route, and the M32 Management measure may also have resulted in lower concentrations at associated monitoring sites. However, these must remain tentative conclusions.

In all cases (apart from the Dodworth bypass), however, it has been impossible to categorically state that any implemented AQAP measures have specifically caused a reduction in NO<sub>2</sub> concentrations at any site. This is due to a multitude of confounding factors (e.g. traffic flow, meteorology) and other, less location-specific AQAP measures that will all have had an impact on concentrations at both Background Urban and Traffic Urban sites. The implementation of more directly focused AQAP measures, e.g. the Dodworth bypass, is necessary to improve air quality at specific pollution hotspots. The problem, as evidenced in the expansion of all of the baseline AQMAs in these case studies, is that traffic pollution has become a much more widespread problem that is less confined to discrete hotspot locations.

All of the case studies had integrated their AQAPs into their LTPs at varying stages in the process and the implementation of measures have been largely determined by the priorities of local transport officers, an issue that was highlighted in previous research (Olowoporoku *et al.*, 2012, Olowoporoku *et al.*, 2011, Olowoporoku, 2010, Olowoporoku *et al.*, 2010, Olowoporoku *et al.*, 2008). Evidence of the setting of mandatory air quality indicators (LTP8) that were not aligned to either the national air quality objectives or the EU limit values in the Oxford AQAP/LTPs was of concern as this clearly demonstrates a lack of commitment to, or an acknowledgement of the impossibility of, achieving the necessary reductions in NO<sub>2</sub> concentrations required by national and EU legislation, and more fundamentally, that are required to prevent worsening of public health.

#### **8.4.5. Evaluation of AQAP measures**

On the basis of the case study local authorities' AQAP measures examined here, there does not appear to be any relationship between high SMART scores and implementation of measures, with the proportion of 'completed' SMART measures varying from 8% (Bristol CC) to 86% (York CC). Although, there is a clear trend in



measures lacking specificity and a means of measuring their success, this does not appear to have had any direct bearing on the number of measures implemented with the proportion of 'completed' Specific measures ranging from 4% (Bristol CC) to 88% (York CC) and 'completed' Measurable measures ranging from 5% (Bristol CC) to 83% (York CC).

This analysis, however, has been undertaken on a small sample of local authorities' AQAPs and may have generated different, and certainly more definitive, results with a more robust sample size on which correlative statistical analysis would have been possible. There are also methodological limitations as acknowledged in section 8.2.4.3, regarding the subjective interpretation of specificity and the classification of 'completed' measures. The implementation of measures may also be more dependent on other factors, e.g. how cost-effective the measure is, rather than whether this information is present. Comparison on the basis of cost-effectiveness, however, would require a standardised approach as the various approaches used by the case study local authorities were not readily comparable. With the integration of AQAPs into LTPs, implementation of measures may actually be more dependent on other LTP priorities, e.g. road safety, reducing congestion and improving accessibility, than air quality, i.e. "shared priorities are not equal priorities" (Olowoporoku *et al.*, 2012).

While this analysis may have indicated that SMART measures need not necessarily be implementable, or that implementable measures need not necessarily be SMART, it is still good practice to ensure that AQAP measures do include SMART information, as recommended in the Defra guidance (see section 4.4.1.1).

## **8.5. Summary**

This chapter has critically discussed the research methodology and its appropriateness and limitations in response to the research statement and objectives, before discussing the results and interpreting the findings in light of those methodological limitations. It has found that while the methodology was robustly devised and implemented, the inability to identify a large enough sample of local authorities on which to further that robust assessment through statistical analysis signifies that the LAQM system, and in particular Action Planning, has not been designed to enable a robust assessment of its effectiveness. In particular, the site selection criteria identified an absence of available AQAP PRs; a lack of monitoring stations with robust data on which trend data could be calculated, and unrepresentative siting of monitors. The analysis of the case studies has confirmed that monitoring sites are often inadequately sited in relation to AQMAs. They have also highlighted difficulties in identifying progress on AQAP measures and



in identifying the impact of the implementation of measures, even where these are location-specific. These issues are summarised in the following chapter and recommendations made on how LAQM could be improved to contribute more effectively to achievement of the EU limit value for nitrogen dioxide annual mean.



## CHAPTER 9. CONCLUSIONS AND RECOMMENDATIONS

### 9.1. Chapter overview

This chapter sets out the conclusion of this research and makes recommendations for improving LAQM's effectiveness in contributing to the achievement of the EU limit value for nitrogen dioxide. Recommendations are also made for further research to contribute towards this aim.

### 9.2. Research statement and objectives

This research has set out to evaluate the effectiveness of the local authorities' Air Quality Action Planning, as evidenced over the last 14 years, as a means to improve local air quality and thereby to assist the UK government in meeting the EU annual mean limit value for NO<sub>2</sub>. The research statement was framed thus:

*Local Air Quality Action Plans are not successful in terms of reducing local concentrations of nitrogen dioxide. Therefore Local Air Quality Management will not achieve the annual mean UK air quality objective and will not make an effective contribution to meeting the relevant EU limit value.*

In order to test that statement, two research objectives were set:

*Objective 1: Document the change in the concentration of annual mean nitrogen dioxide from road traffic using continuous monitoring data, in AQMAs declared in Round 1 of Review and Assessment;*

*Objective 2: Evaluate whether the measures included in the Air Quality Action Plans produced following Round 1 are being achieved and whether implementation is contributing to an improvement in local nitrogen dioxide concentrations.*

### 9.3. Research summary

This research has focused on those AQMAs declared following Round 1 for exceedences of the annual mean nitrogen dioxide objective, relating to road traffic sources, in England, in order to provide a robust sample on which to draw conclusions. This sample represented 158 AQMAs in 83 local authorities, 26% of all England local authorities (excluding London) at that time. Three criteria were set to identify those Round 1 baseline AQMAs and local authorities for which the research objectives could be determined, i.e. those with representative monitoring sites and robust monitoring data (for Objective 1) and with Air Quality Action Plans and subsequent Action Plan Progress Reports to assess implementation (for Objective 2). Application of these criteria identified eight AQMAs in six local authorities, i.e. 5% of the Round 1 baseline

AQMAs and 7% of the Round 1 baseline local authorities. Trends in local annual mean nitrogen dioxide concentrations were calculated for relevant monitoring sites within these case study AQMAs and compared with implemented measures identified from their Air Quality Action Plans. An evaluation of these case studies' Action Plan measures was also made using SMART objective criteria.

#### **9.4. Research conclusions**

The key finding from this research is a confirmation of the thesis statement, i.e. that currently LAQM is not a successful strategy in achieving selected EU limit values. An absence of adequate AQAP progress reporting and representatively sited robust monitoring data indicate that, collectively, the means to assess the effectiveness of LAQM in terms of reducing local concentrations of NO<sub>2</sub> does not currently exist.

It is clear that, despite the opportunity that LAQM provided to assist the government with achievement of the EU limit values, the process was never calibrated sufficiently to provide a measureable contribution. There are several factors that have been identified in this research to corroborate this statement.

Firstly, the Zones and Agglomerations that the government devised in response to the Air Quality Framework Directive (96/62/EC) are not contiguous with local authority boundaries or the AQMAs therein. If there was ever any intention to allow local authorities' AQMAs to feed into national reporting to the European Commission this fundamental step could have been taken.

Second, there are insufficient government monitoring sites available to gauge progress against EU limit values in AQMAs. This research has shown that only one AQMA had adequately sited Traffic Urban and Background Urban AURN sites available, and even this Traffic Urban site had been shown not to be compliant with EU siting criteria. The government could have established AURN sites in each AQMA in order to assess changes in concentrations of the key pollutants, e.g. NO<sub>2</sub>, against which progress in the local AQAPs and national measures may be assessed.

Thirdly, local authority monitoring sites are not required to be compliant with EU siting or operational criteria. Many local authorities operate automatic monitoring within their AQMAs and are required to adhere to QA/QC procedures to qualify the use of that data in their LAQM reporting. If siting AURN monitors within all of the AQMAs was not feasible, the government could have ensured that LAQM monitoring QA/QC procedures were in line with those required by the European Commission, thereby

increasing the network of reportable monitoring data that could be used to determine progress made on local and national actions within AQMAs.

Fourthly, the requirement for local authorities to produce AQAPs (within 18 months of declaration of an AQMA) and annual AQAP PRs is not enforced. This research found that some local authorities that had declared AQMAs had not published AQAPs within the specified timescale or within a number of years in some cases. Similarly, progress on the AQAPs is required annually, but there was an absence of annual AQAP Progress Reports found in this study. This is perhaps one of the most significant failings, as without the ability to gauge progress on measures implemented at a local level, neither national nor local government can show whether LAQM is working to improve local air quality.

In conclusion, the findings from this research have indicated that LAQM is insufficiently calibrated to provide adequate support to the achievement of the NO<sub>2</sub> EU limit value.

#### **9.5. Recommendations for improving the effectiveness of LAQM**

The following recommendations are made for Defra, and the Devolved Administrations of Scotland, Wales and Northern Ireland, to improve the effectiveness of LAQM in assisting with the achievement of the NO<sub>2</sub> annual mean EU limit value. They are proposed as solutions to the limitations and obstacles observed in undertaking this research, in order to facilitate a combined effort both nationally and locally to reducing traffic-related nitrogen dioxide concentrations in order to achieve the EU limit value. The current revision of LAQM and the recent changes to the EU AAQD reporting requirements make this an opportune moment to instigate these proposed changes.

<p><b>Recommendation 1. Integrate LAQM with UK compliance assessment reporting to the European Commission</b></p>
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Formally integrating LAQM with the UK's compliance assessment reporting would provide a more coordinated and cost-effective approach to reducing NO<sub>2</sub> concentrations. It is recognised that the two-tier system of national and local air quality management has arisen in response to different scales of assessment, but it is clear that the scale of local exceedences has outgrown local authorities' ability to manage with existing resources. It is not proposed that the scales of operation are changed; it is absolutely necessary that local authorities continue to assess air quality at a local scale in order to capture the hotspots of public exposure that Defra's national compliance assessment misses. Likewise, it would not be feasible to expect Defra to undertake assessments at a finer resolution than required by the

AAQD. Instead it is proposed that a fully coordinated and complementary approach is adopted whereby the purposes of both parties are met. This would involve reporting local monitoring and management to the European Commission as part of the UK's compliance assessment reporting. The remaining recommendations provide further detail on how this might be achieved, and it is therefore further recommended that these recommendations are considered as a complete package.

**Recommendation 2. Align Zones and Agglomerations with local authority boundaries**

The Zones and Agglomerations that provide the bases for Defra's compliance reporting to the European Commission are defined on the basis of population for agglomerations (>250,000 or appropriate population density) with the zones in England being aligned with the now redundant Government Offices of the Regions. It was observed in undertaking this research that some AQMAs fall within more than one Zone or Agglomeration. In order to facilitate nested reporting on local Air Quality Action Plans to the European Commission, it is recommended that the Zones and Agglomerations are amended to coincide with regional groups of local authority boundaries.

Under the Commission Implementing Decision on the reciprocal exchange of information and reporting on ambient air quality (2011/850/EU) member states were required to submit GIS files of their Zones and Agglomerations by 31<sup>st</sup> December 2013. Approval from the European Commission must be sought for amendment of the boundaries as the UK is currently subject to a time extension, however, it may be an opportune moment to initiate these incremental changes, with the revision of the EU reporting requirements and LAQM, to come into effect once the time extension period for NO<sub>2</sub> is complete in 2015.

**Recommendation 3. Ensure that local authorities clearly identify the area of exceedence (plus a margin of error) as well as the AQMA (if not coterminous)**

Currently, the spatial extent of an AQMA is at the discretion of the local authority and is as much a political as a scientific decision-making process (Woodfield, 2004). While there are advantages and disadvantages to declaring AQMAs purely on the areas of exceedence or larger areas, including whole boroughs, the variation between local authorities means that there is no comparability. It has been argued that, as the AQMA is a 'management area' it makes sense to declare a larger area

than just the area of exceedence to take account of the fact that management of the source (road traffic) will normally require a wider focus than simply where the exceedence occurs. However, in so doing, the original exceedence area becomes lost and any monitoring or management measure associated with the AQMA may not necessarily be representative of the worst-case location. It is therefore proposed that local authorities are required to also identify the area of exceedence associated with their AQMA(s), where these are not coterminous, to maintain focus on those hotspot areas where concentrations require most attention. It would be advisable for the area of exceedence to include a margin of error, e.g. 10% below the objective contour for modelled concentrations or an appropriate distance buffer for measured concentrations.

**Recommendation 4. Require AQAP measures to be targeted at reducing concentrations of NO<sub>2</sub> in the area of exceedence**

This recommendation is linked to the previous one in its intention to focus attention on the area of exceedence in order to achieve the EU limit value. While there are usually considerations aside from air quality in prioritising Action Plan measures, particularly those that are also integrated into LTPs, it is important to refocus attention on the reduction of concentrations in the area of exceedence if the limit value is to be achieved.

**Recommendation 5. Ensure that all local authorities, that are required to, report annually on their AQAPs so that these reports can be incorporated in the UK's compliance assessment reporting**

The requirement for local authorities with AQAPs to report annually on their progress in implementing measures is already included in the statutory guidance. This recommendation simply requires that local authorities are held to account when their adherence with this requirement lapses. Based on the lack of available annual reporting on AQAP measures for some local authorities as identified in this research, it is assumed that local authorities are not currently held accountable for missing reports. However, regular reporting on AQAP progress is essential to identify locally what action is being taken to reduce concentrations, and to report that to the European Commission as part of an integrated air quality management approach.

**Recommendation 6. Standardise AQAP reporting requirements to ensure consistency of data reported to the European Commission**

This measure is also linked to the previous one, but specifically focuses on standardisation of the format and content of local AQAP reporting to the European Commission. In reviewing numerous AQAPs and AQAP PRs in undertaking this research, extraction of the necessary data was hampered by inconsistencies in formatting and content between and within local authorities' reports. Variability in cost-effectiveness assessments, timescales, use of indicators, etc. made comparability of the measures included on these bases impossible. In order to ensure consistent reporting format and content for reporting to the European Commission, it is recommended that Defra provide a standard template for AQAP and AQAP PR reporting, to facilitate extraction of the necessary data with ease of comparison. To ensure a consistent approach, this may utilise the Action Plan reporting requirements of the European Commission.

**Recommendation 7. Expand the AURN in association with local authorities to ensure that AQMAs have robust representative monitoring sites**

One of the most significant limitations of LAQM identified in this research was the lack of monitoring sites that were representative of AQMAs. Robust assessment is essential to evaluating the effectiveness of AQAP measures and yet 75% of the AQMAs that had been declared for NO<sub>2</sub> annual mean from Round 1 in England had no representative AURN sites. While it is recognised that the requirements of LAQM and UK compliance assessment are different, it is considered that there is scope for consolidating local and national assessment to meet the needs of both. This is one of the key aspects to the overarching recommendation to integrate LAQM with compliance assessment. A comprehensive review of all AURN and local authority continuous monitoring sites should be undertaken in order to judiciously maximise their representativeness to AQMAs and EU assessment requirements. A rationalisation of monitoring sites may then be possible with unrepresentative or unnecessary monitors redeployed where gaps are identified. The additional monitors that Defra have recently announced (Connolly and Kent, 2013) that are to be phased in over the next few years could then help to fill any remaining gaps. As part of the integrated air quality management approach, local authority monitors could also be reported to the European Commission, subject to implementation of Recommendations 8 and 9.



**Recommendation 8. Ensure that continuous monitoring QA/QC is rigorous and that monitors are kept in situ for at least the duration of the exceedance in order to assess trends**

This recommendation applies both to AURN and local authority monitoring sites as part of the integrated air quality management approach. One of the other most significant limitations identified in this research was the lack of monitoring sites with robust data over substantial periods to enable trends to be calculated. Furthermore, discontinuation of monitoring sites that were still reporting exceedances was observed in some case studies, even where there was no apparent reason. It is therefore recommended that rigorous QA/QC is maintained to maximise annual data capture, and that representative monitoring sites are kept in situ at least until concentrations are no longer exceeding in order to assess trends.

**Recommendation 9. Standardise local authority reporting of site type classifications, location and monitoring data to ensure consistency of data reported to the European Commission**

In undertaking this research, a number of inconsistencies were identified in local authorities' classification of site types, grid referencing and reporting of monitoring data, sometimes in contradiction with AURN sites' data reported by Defra. In order to enable an integrated air quality management approach, in which local authority monitoring data are reported to the European Commission, there needs to be standardisation of these aspects of local authorities' monitoring data reporting.

#### **9.6. Recommendations for further research**

The following recommendations for further research are intended to complement the recommendations above and respond to some of the limitations identified in this research.

**Research recommendation 1. Optimise AURN and local authority monitoring sites to facilitate integrated national and local air quality management**

Recommendation 7 above proposes a consolidation and rationalisation of AURN and local authority monitoring sites to facilitate integrated national and local air quality management. This would involve an in-depth review of all monitoring sites and AQMAs as well as EU assessment and siting criteria followed by an analysis of optimal sites based on meeting those requirements. The analysis aspects of this

review would be possible using GIS, facilitated by the work already undertaken in this research.

**Research recommendation 2. Investigate alternative approaches to calculating local contribution NO<sub>2</sub> concentrations**

The application of the NO<sub>x</sub> emissions approach to identification of local contribution NO<sub>2</sub> concentrations (i.e. Traffic Urban sites minus Background Urban sites) was acknowledged in this research as being simplistic, and, as demonstrated in the case studies' analysis was heavily dependent on having both representative Traffic and Background monitors, which was demonstrably not always the case. It is therefore recommended that alternative approaches to assessing local contribution NO<sub>2</sub> are investigated so that local authorities are able to accurately measure the effectiveness of AQAP measures.

**Research recommendation 3. Investigate a robust approach to quantification of air quality action plan measures**

Two criticisms of the Action Plan measures presented in the case studies were a lack of specific and measurable actions. Quantification of AQAP measures is a necessary requirement to ensure action plans are appropriately calibrated to achieve the necessary reduction in emissions and concentrations to achieve the health-based objectives as quickly as possible. A more robust system to calculate the required reduction and translate this into actions to achieve that reduction would help local authorities to more cost-effectively prioritise and coordinate limited resources to achieve improvements in local air quality.

**Research recommendation 4. Consider how EU air quality legislation could be better designed to reflect local exposure**

One of the fundamental aspects underpinning this research has been the UK's two-tier approach to air quality management, which has arisen, in part, due to the differing scales of operation required by the EU Directive 2008/50/EC and the *Environment Act* (1995). With the recent publication of the new Clean Air Programme for Europe and potential for further simplification of the implementation of the AAQD 2008/50/EC, there is scope for research to investigate how other member states' interpretation of the Directive have addressed local exposure, and how, and whether, EU legislation should be changed to ensure that local exposure is not overlooked.

### **9.7. Summary**

This chapter has reported the conclusions of this research and made nine recommendations for Defra to improve the effectiveness of LAQM's contribution to achieving the EU limit value for annual mean nitrogen dioxide, by introducing an integrated national and local air quality management approach. Four recommendations for further research have also been made to facilitate this recommended approach and to address limitations identified in this research.



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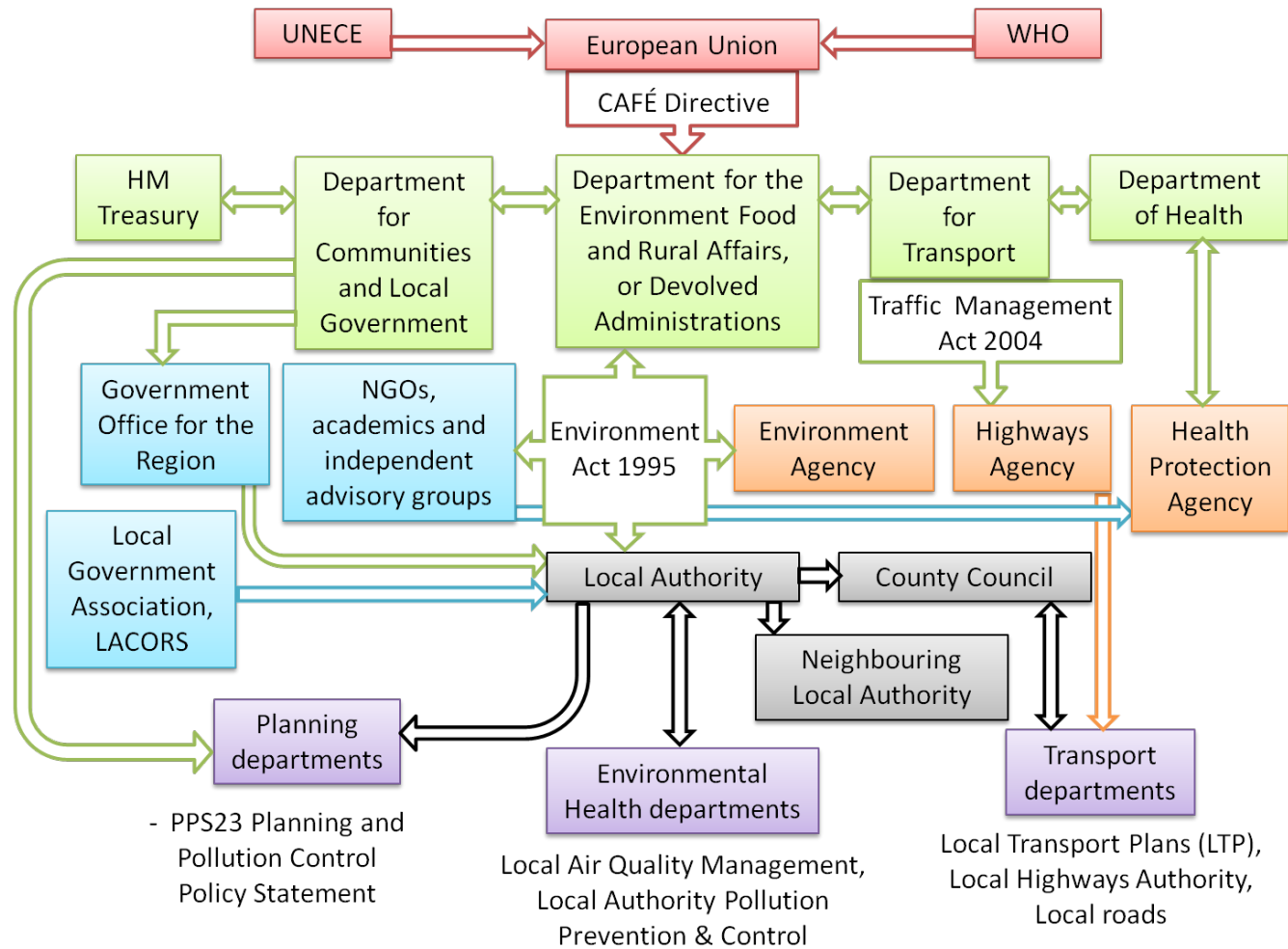
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## **APPENDICES**

- Appendix 1: The delivery chain for improving air quality in England
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**Appendix 1: The delivery chain for improving air quality in England**



## Appendix 2: UK Air Quality Management Legislation, Guidance and Round deadlines

Dates enacted/ published/due	UK Air Quality Management Legislation, Guidance and Round deadlines
19/07/1995	Environment Act 1995 (Part IV)
March 1997	National Air Quality Strategy (March 1997)
23/12/1997	National Air Quality Regulations (December 1997)
December 1997	Guidance documents G1(97)-G4(97)
April 1998	Technical Guidance LAQM.TG1(98)-TG4(98)
January 1999	NSCA guidance - AQMAs: Turning Reviews into Action
31/12/1999	Original deadline for completion of Round 1
January 2000	NSCA guidance - Consultation for LAQM: the how to guide
January 2000	Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)
March 2000	Guidance documents G1(00)-G4(00)
06/04/2000	Air Quality Regulations for England (2000)
06/04/2000	Air Quality Regulations for Scotland (2000)
June 2000	Second deadline for completion of Round 1
01/08/2000	Air Quality Regulations for Wales (2000)
01/08/2000	Technical Guidance LAQM.TG1(00)-TG4(00)
November 2000	NSCA guidance - Air Quality Action Plans: Interim guidance for LAs
31/12/2000	Final deadline for completion of Round 1
June 2001	NSCA guidance - Air Quality: Planning for Action
11/12/2002	Air Quality (Amendment) Regulations for England (2002)
31/12/2002	Air Quality (Amendment) Regulations for Wales (2002)
12/06/2002	Air Quality (Amendment) Regulations for Scotland (2002)
17/01/2003	The Environment (Northern Ireland) Order 2002
09/09/2003	Air Quality Regulations (Northern Ireland) 2003
January 2003	Technical Guidance LAQM.TG(03)
February 2003	Policy Guidance LAQM.PG(03)
February 2003	Air Quality Strategy: Addendum
31/05/2003	Deadline for Round 2 Updating and Screening Assessments
December 2003	Progress Report Guidance LAQM.PRG(03)
2003	Policy Guidance LAQM.PGNI(03) for Northern Ireland
January 2004	NSCA guidance - AQMAs: A review of procedures and practices for LAs
January 2004	Deadline for Round 2 Detailed Assessments or Progress Reports
November 2004	NSCA Guidance - Development Control: Planning for Air Quality
March 2005	Addendum to LAQM Guidance LAQM.PGA(05)
30/04/2005	Deadline for Round 2 second Progress Reports

30/04/2006	Deadline for Round 3 Updating and Screening Assessments
September 2006	NSCA Guidance - Development Control: Planning for Air Quality (2006 update)
30/04/2007	Deadline for Round 3 Detailed Assessments or Progress Reports
17/07/2007	Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007
30/04/2008	Deadline for Round 3 second Progress Reports
February 2009	UK Technical guidance LAQM.TG(09)
February 2009	Defra LAQM.PG(09)
12/02/2009	Scottish Government LAQM PG (09)
30/04/2009	Deadline for Round 4 Updating and Screening Assessments
May 2009	Welsh Assembly Government LAQM PG (09)
June 2009	NSCA Guidance - Biomass and Air Quality
April 2010	NSCA Guidance - Development Control: Planning for Air Quality – 2010 Update
30/04/2010	Deadline for Round 4 Detailed Assessments and Progress Reports
29/07/2010	Department of Environment Northern Ireland LAQM PG (09)

Key: **Legislation**, **Regulations**, **Strategy**, **Statutory Guidance**, non-statutory guidance, R&A reporting deadlines

**Appendix 3: Review and Assessment report submissions and outcomes**

**Appendix 3. Table 1: Number of local authorities completing Stage 3 reports by each of the Round 1 deadlines (adapted from: Laxen et al., 2002)**

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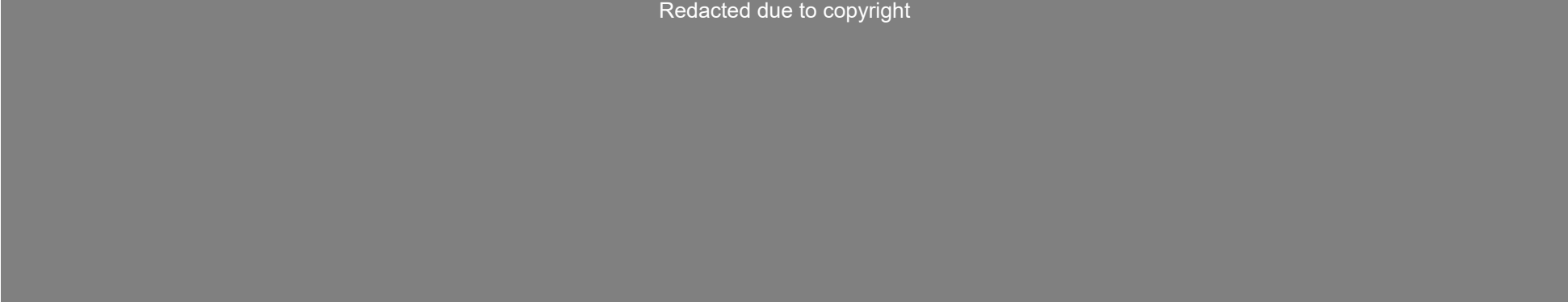
**Appendix 3. Table 2: Number of local authorities submitting reports in Round 2 (adapted from: Hayes et al., 2009a)**

Redacted due to copyright



**Appendix 3. Table 3: Number of local authorities submitting reports in Round 3 (adapted from: Barnes et al., 2010a)**

Redacted due to copyright



**Appendix 3. Table 4: Number of local authorities submitting reports in Round 4 (up to November 2010) (adapted from: Barnes et al., 2010b)**

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**Appendix 3. Table 5: Number of local authorities with current AQMAs declared, by pollutant (adapted from October 2009 Quarterly Progress Report) (Hayes et al. 2009b)**

Redacted due to copyright

**Appendix 3. Table 6: Local authorities with AQMAs in the UK by pollutant and source (July 2010) (Hayes et al. 2010)**

Redacted due to copyright



**Appendix 4: Number of local authorities with AQMAs (adapted from Vaughan (2013))**

Redacted due to copyright

**Appendix 5: Action Planning process (from NSCA, 2001)**

Redacted due to copyright



**Appendix 6: Air Quality Action Plan Checklist of Actions - Road Transport Actions**

Measure	Have Options been Considered	How many Options Considered	Transport impact	AQ Impact	Was this modelled or measured	Socio-Economic	Other Environmental	Costs	Has this measure been chosen?	Commentary
Physical Traffic Management: speed & flow										
Re-routing and road hierarchy										
Access Control & Clear Zones										
Commercial Delivery Strategy										
Low Emission Zones										
Road User Charging/ Workplace Parking Levy										
Parking Management & Charging										
UTMC Systems										
Infrastructure Development										
Reallocated Roadspace/ pedestrianisation										
Public Transport Initiatives - Bus										
Public Transport Initiatives – Rail / other										
Development of Cycling and Walking										
Partnerships & Travel Plans (Workplace & School)										
Promotion, Education & Awareness Raising										
Fleet Management, clean fuels/ additives, Green Procurement and abatement measures.										
Infrastructure for cleaner fuels										
Eco-driving training										
Land Use Planning										
Freight Measures										
Roadside Emissions Testing										
Vehicle Idling Enforcement										
Compulsory Purchase										

## **Appendix 7: Methodology tables**

Appendix 7. Table 4: Round 1 database, Progress table - England Table analysis

Appendix 7. Table 5: Round 1 database, P1 Designated AQMAs Table analysis

Appendix 7. Table 2: AQMAs database, R1 AQMAs Table analysis

Appendix 7. Table 7: Local authorities in England that declared AQMAs in Round 1 (n = 96 [90 for NO<sub>2</sub>, 81 following S4 revocations])

Appendix 7. Table 8: Discrepancies between R1 AQMAs list and GIS dataset

Appendix 7. Table 6: 2005 AQMAs dataset with corresponding Zone/Agglomeration

Appendix 7. Table 10: Local authority reports obtained indicating whether they include Monitoring data, updates on AQAP Actions or Both

Appendix 7. Table 11: Local authorities meeting Criteria 1: Compliance with Action Plan Progress Reporting requirements

Appendix 7. Box 1: R script to convert AURN data from 'long' to 'wide' format

Appendix 7. Table 12: AURN Roadside (traffic) sites < 500 m of 2005 AQMA dataset

Appendix 7. Table 13: AURN Urban Centre (Background Urban) sites < 5 km of 2005 AQMA dataset

Appendix 7. Table 14: AURN Rural/Remote (background rural) sites < 50 km of 2005 AQMA dataset

Appendix 7. Table 15: AQMAs with suitability of AURN sites' locations

Appendix 7. Table 16: AQMAs with sufficiency of AQAPs and AQAP PRs and suitably located monitoring stations with sufficient data

Appendix 7. Table 3: Details of local authority monitoring sites suitably sited in relation to AQMAs (from Progress Reports (2010-2013) and Updating and Screening Assessments (2009 & 2012))

Appendix 7. Table 18: AQMAs and representative local authority monitoring sites

Appendix 7. Table 19: AQMAs with both Traffic Urban and Background Urban monitoring sites (including AURN and local authority monitors)

Appendix 7. Table 20: Local Authorities and AQMAs with AURN and LA monitoring sites that meet siting and data capture criteria

**Appendix 7. Table 4: Round 1 database, Progress table - England Table analysis**

Database	Table	Column	Filter	Total records	Filtered records	NO <sub>2</sub>	PM <sub>10</sub>	NO <sub>2</sub> & PM <sub>10</sub>
Round 1	Progress table - England	AQMA (1) Proceed	Yes	320	94			
Round 1	Progress table - England	NO2 (AQMA 1) Proceed	Yes	320	87			
Round 1	Progress table - England	PM10 (AQMA 1) Proceed	Yes	320	30	26		
Round 1	Progress table - England	SO2 (AQMA 1) Proceed	Yes	320	12	7	5	3
Round 1	Progress table - England	AQMA (2) Proceed	Yes	320	3			
Round 1	Progress table - England	NO2 (AQMA 2) Proceed	Yes	320	0			
Round 1	Progress table - England	PM10 (AQMA 2) Proceed	Yes	320	1			
Round 1	Progress table - England	SO2 (AQMA 2) Proceed	Yes	320	2			

**Appendix 7. Table 5: Round 1 database, P1 Designated AQMAs Table analysis**

Database	Table	Column	Filter	Total records	Filtered records	England	London	Scotland	Wales	NI
Round 1	P1 Designated AQMAs	England	1	146	94					
Round 1	P1 Designated AQMAs	London	1	146	35					
Round 1	P1 Designated AQMAs	Scotland	1	146	3					
Round 1	P1 Designated AQMAs	Wales	1	146	5					
Round 1	P1 Designated AQMAs	Northern Ireland	1	146	4					
Round 1	P1 Designated AQMAs	NO2 AQMA (1)	Yes	146	131	87	34	3	4	1
Round 1	P1 Designated AQMAs	Annual NO2 (AQMA 1)	Yes	146	126	83	33	3	4	1
Round 1	P1 Designated AQMAs	Hourly (AQMA 1)	Yes	146	14	2	8	1	2	1
Round 1	P1 Designated AQMAs	PM10 AQMA (1)	Yes	146	63	28	28	0	1	4
Round 1	P1 Designated AQMAs	Annual PM10 (AQMA 1)	Yes	146	11	1	6	0	0	4
Round 1	P1 Designated AQMAs	24-hour (AQMA 1)	Yes	146	59	25	26	0	1	4
Round 1	P1 Designated AQMAs	SO2 (AQMA 1)	Yes	146	8	7	0	0	0	0
Round 1	P1 Designated AQMAs	revoke AQMA	FALSE	146	119	72	31	3	4	4

**Appendix 7. Table 6: AQMAs database, R1 AQMAs Table analysis**

Database	Table	Column	Filter	Total records	Filtered records	England	London	Scotland	Wales	NI
AQMAs	R1 AQMAs	Eng	1	134	94					
AQMAs	R1 AQMAs	Lon	1	134	33					
AQMAs	R1 AQMAs	Sco	1	134	3					
AQMAs	R1 AQMAs	Wales	1	134	4					
AQMAs	R1 AQMAs	Ire	1	134	0					
AQMAs	R1 AQMAs	NO2 (AQMA 1)	TRUE	134	126	88	32	3	3	0
AQMAs	R1 AQMAs	annual NO2 (AQMA 1)	TRUE	134	121	84	31	3	3	0
AQMAs	R1 AQMAs	hourly (AQMA 1)	TRUE	134	12	2	8	1	1	0
AQMAs	R1 AQMAs	PM10 (AQMA 1)	TRUE	134	54	26	27	0	1	0
AQMAs	R1 AQMAs	annual PM10 (AQMA 1)	TRUE	134	7	1	6	0	0	0
AQMAs	R1 AQMAs	24 hour (AQMA 1)	TRUE	134	49	23	25	0	1	0
AQMAs	R1 AQMAs	SO2 (AQMA 1)	TRUE	134	6	6	0	0	0	0
AQMAs	R1 AQMAs	revoke AQMA	FALSE	134	116	79	30	3	4	0
AQMAs	R1 AQMAs	retain some AQMA(s)	non-blanks	134	9	8	1	0	0	0



**Appendix 7. Table 7: Local authorities in England that declared AQMAs in Round 1 (n = 96 [90 for NO<sub>2</sub>, 81 following S4 revocations])**

Local authority	Region	Declared	Status	Amended	Revoked	No of AQMAs	NO <sub>2</sub>	Source
Babergh District Council	E	07/09/2001	Revoked		09/03/2004	4	Annual	Transport
Barnsley Metropolitan Borough Council	E	03/10/2001	Current			1	Annual	LTP Roads
Bath & North East Somerset Council	E	01/02/2002	Amended	19/08/2005		1	Annual	Transport
Birmingham City Council	E	10/01/2003	Amended	05/05/2005		1	Annual	Mixed Roads
Blaby District Council	E	19/01/2001	Amended	20/10/2005		3	Annual	Transport
Bolsover District Council	E	01/12/2001	Amended	02/07/2004		1	Annual	Transport
Bolton Metropolitan Borough Council	E	08/03/2002	Current			1	Annual	Tr/Ind
Spelthorne Borough Council	E	01/12/2000	Revoked		01/08/2003	1	Both	Transport
Spelthorne Borough Council	E	01/08/2003	Current			1	Annual	Transport
Boston Borough Council	E	10/09/2001	Current			1	Annual	Transport
Bristol City Council	E	01/05/2001	Amended	01/05/2003		2	Annual	Tr/Ind
Bromsgrove District Council	E	26/07/2001	Revoked		13/12/2002	1	Annual	Transport
Bromsgrove District Council	E	26/07/2001	Revoked		13/12/2002	1	Annual	Transport
Bromsgrove District Council	E	26/07/2001	Current			1	Annual	Transport
Broxbourne Borough Council	E	01/11/2001	Amended	01/03/2004		1	Annual	HA Roads
Bury Metropolitan Borough Council	E	17/07/2002	Amended	19/03/2007		4	Annual	Transport
Charnwood Borough Council	E	20/06/2001	Amended	29/11/2004		3	Annual	Transport
York City Council	E	21/01/2002	Current			1	Annual	LTP Roads
Colchester Borough Council	E	01/05/2001	Current			1	Annual	Transport
Coventry City Council	E	31/07/2003	Amended			2	Annual	Transport
Dartford Borough Council	E	01/10/2001	Current			1	Annual	Transport
Derby City Council	E	01/08/2001	Amended	01/09/2002		1	Annual	Transport
Derby City Council	E	01/09/2002	Amended	23/10/2006		2	Annual	Transport
Doncaster Metropolitan Borough Council	E	01/08/2001	Current			3	Annual	Transport
Doncaster Metropolitan Borough Council	E	01/06/2003	Current			1	Annual	Transport
Dover District Council	E	20/06/2002	Current			1		Transport
Dudley Metropolitan Borough Council	E	10/03/2003	Amended	06/12/2007		1	Annual	LTP Roads

Local authority	Region	Declared	Status	Amended	Revoked	No of AQMAs	NO <sub>2</sub>	Source
East Hertfordshire District Council	E	06/08/2001	Revoked		28/07/2004	1		Transport
Erewash Borough Council	E	01/02/2002	Current			2	Annual	Transport
Fenland District Council	E	01/05/2001	Current			2		Industrial
Gedling Borough Council	E	05/05/2002	Revoked		05/04/2007	1		Industrial
Gravesham Borough Council	E	01/01/2002	Current			2	Annual	Tr/Ind
Harborough District Council	E	18/07/2001	Current			1	Annual	Transport
Herefordshire Council	E	23/11/2001	Current			1	Annual	LTP Roads
Hertsmere Borough Council	E	01/09/2001	Revoked		08/04/2003	14	Annual	Transport
Hertsmere Borough Council	E	08/04/2003	Current			4	Annual	HA Roads
Hinckley and Bosworth Borough Council	E	09/05/2001	Revoked		15/07/2004	2	Annual	Transport
King's Lynn and West Norfolk Borough Council	E	01/05/2002	Revoked		11/08/2006	1		Industrial
King's Lynn and West Norfolk Borough Council	E	01/11/2003	Current			1	Annual	Transport
Lancaster City Council	E	12/03/2004	Current			1	Annual	LTP Roads
Leeds City Council	E	01/07/2001	Current			2	Annual	Tr/Dom
Leicester City Council	E	04/12/2000	Current			1	Annual	Transport
Lincoln City Council	E	01/12/2001	Current			1	Annual	LTP Roads
Liverpool City Council	E	01/06/2003	Amended	01/04/2009		2	Annual	Transport
Luton Borough Council	E	03/11/2003	Current			1	Annual	HA Roads
Maidstone Borough Council	E	01/08/2001	Amended	01/08/2008		1	Annual	HA Roads
Manchester City Council	E	31/07/2001	Current			1	Annual	Transport
Medway Council	E	14/01/2002	Amended	28/05/2004		7	Annual	Tr/Ind
Melton Borough Council	E	21/04/2001	Revoked		18/05/2002	1	Annual	Transport
North Somerset Council	E	01/05/2002	Revoked		25/07/2003	1	Annual	Transport
North Warwickshire Borough Council	E	01/03/2001	Current			1	Annual	Transport
North West Leicestershire District Council	E	23/04/2001	Amended	26/07/2004		6	Annual	Transport
Northampton Borough Council	E	06/01/2003	Current			1	Annual	HA Roads
Norwich City Council	E	01/06/2003	Current			3	Annual	Transport
Nottingham City Council	E	01/02/2002	Current			1	Annual	Transport
Oadby & Wigston District Council	E	12/03/2002	Revoked		01/04/2008	4	Annual	LTP Roads

Local authority	Region	Declared	Status	Amended	Revoked	No of AQMAs	NO <sub>2</sub>	Source
Oldham Metropolitan Borough Council	E	01/06/2001	Current			1	Annual	Transport
Oswestry Borough Council	E	01/06/2003	Current			1	Annual	Transport
Oxford City Council	E	01/09/2001	Current			1	Annual	Transport
Reigate and Banstead Borough Council	E	30/04/2002	Revoked		23/12/2003	5	Annual	Transport
Reigate and Banstead Borough Council	E	23/12/2003	Current			3	Annual	Mixed Roads
Rochdale Metropolitan Borough Council	E	29/01/2002	Amended	03/11/2005		3	Annual	Mixed Roads
Rotherham Metropolitan Borough Council	E	01/01/2002	Current			2	Annual	Tr/Ind
Rotherham Metropolitan Borough Council	E	07/07/2003	Current			2	Annual	Domestic
Runnymede Borough Council	E	04/12/2001	Current			2	Annual	Transport
Rushmoor Borough Council	E	31/10/2000	Revoked		09/09/2002	1	Annual	Transport
Salford Metropolitan Borough Council	E	11/06/2001	Amended	01/08/2005		1	Annual	Transport
Salisbury District Council	E	24/07/2001	Amended	16/02/2005		4	Annual	LTP Roads
Salisbury District Council	E	07/08/2003	Revoked		03/06/2005	1	Annual	LTP Roads
Sandwell Metropolitan Borough Council	E	08/10/2002	Current	26/07/2005		6	Annual	Transport
Scarborough Borough Council	E	01/08/2004	Current			1		Domestic
Sedgemoor District Council	E	06/02/2002	Revoked		02/09/2005	1		Industrial
Sevenoaks District Council	E	01/03/2002	Amended	01/09/2006		5	Annual	Mixed Roads
Sheffield City Council	E	05/12/2001	Amended	01/12/2006		2	Annual	Transport
Shrewsbury & Atcham Borough Council	E	01/05/2003	Amended	01/03/2006		3	Annual	LTP Roads
South Bucks District Council	E	01/10/2004	Current			1	Annual	Transport
South Gloucestershire District Council	E	01/11/2001	Revoked		15/03/2004	1	Annual	Transport
South Kesteven District Council	E	01/08/2001	Current			4	Annual	Transport
South Lakeland District Council	E	05/05/2001	Current			1	Annual	Transport
South Lakeland District Council	E	01/05/2002	Revoked		01/03/2004	1		Transport
South Northamptonshire Council	E	01/10/2005	Current			1	Annual	HA Roads
South Oxfordshire District Council	E	01/01/2003	Current			1	Annual	LTP Roads
South Somerset District Council	E	01/09/2002	Current			1	Annual	Transport

Local authority	Region	Declared	Status	Amended	Revoked	No of AQMAs	NO <sub>2</sub>	Source
St Albans District Council	E	02/09/2002	Amended	21/09/2004		7	Annual	Transport
St Edmundsbury Borough Council	E	01/09/2001	Revoked		14/01/2003	4	Annual	Transport
Stockport Metropolitan Borough Council	E	21/12/2001	Current			1	Annual	Transport
Stoke-on-Trent City Council	E	23/11/2001	Revoked	04/04/2006	06/12/2007	1	Annual	Transport
Stoke-on-Trent City Council	E	15/08/2002	Current			1		Industrial
Stroud District Council	E	30/04/2001	Revoked		25/02/2004	1	Annual	Transport
Surrey County Council	E	01/04/2002	Current			1	Annual	Transport
Swale Borough Council	E	01/05/2009	Current			1	Annual	LTP Roads
Tameside Metropolitan Borough Council	E	01/07/2001	Amended	01/09/2005		4	Annual	Mixed Roads
Taunton Deane Borough Council	E	15/01/2003	Current			2	Annual	Transport
Telford & Wrekin Council	E	11/04/2002	Revoked		17/11/2003	4	Annual	Transport
Tewkesbury Borough Council	E	30/06/2001	Revoked		25/02/2004	1	Annual	Transport
Three Rivers District Council	E	01/04/2001	Current			3	Annual	Transport
Thurrock Council	E	01/04/2001	Amended	01/02/2005		20	Annual	Transport
Tonbridge and Malling Borough Council	E	01/05/2001	Current			1	Annual	HA Roads
Trafford Metropolitan Borough Council	E	29/06/2001	Amended			1	Annual	Transport
Wakefield Metropolitan District Council	E	21/01/2004	Amended	09/03/2006		2	Annual	HA Roads
Walsall Metropolitan Borough Council	E	04/07/2002	Revoked		01/04/2006	5	Annual	Transport
Warrington Borough Council	E	01/11/2001	Current			1	Annual	HA Roads
West Wiltshire District Council	E	26/11/2001	Current			2	Annual	Transport
Wigan Metropolitan Borough Council	E	13/08/2001	Current			12	Annual	Transport
Winchester City Council	E	14/11/2003	Current			1	Annual	Transport
Wokingham District Council	E	28/09/2001	Amended	07/05/2004		2	Both	Transport
Wycombe District Council	E	01/08/2001	Current			1	Annual	Transport
Wyre Forest District Council	E	06/01/2003	Amended			2	Annual	Transport

**Key:** Declared for pollutants other than NO<sub>2</sub>; revoked following S4 report.

**Appendix 7. Table 8: Discrepancies between R1 AQMAs list and GIS dataset**

Local authority	AQMA	In R1 AQMAs list	In GIS dataset	Reason for discrepancy
Leeds	AQMA 2 Ladybeck Close	Y	N	AQMA originally declared for PM <sub>10</sub> , later revoked and changed to NO <sub>2</sub>
Rushmoor	M3 AQMA	Y	N	Not in GIS dataset
South Kesteven	No. 2	Y	Y	AQMA correct but incorrect details in GIS dataset (should be No. 1 Wharf Road)
South Northamptonshire	Towcester AQMA	Y	N	AQMA not declared until 1/10/2005 (Round 2)
St Albans	AQMA 7 (Frogmore and Colney St)	Y	N	Not in GIS dataset
Swale	N/A	Y	N	Defra accepted AQMA not required from S3 report
Brentwood	BRW2	N	Y	Declared 10/1/2005
Brentwood	BRW3	N	Y	Declared 10/1/2005
Brentwood	BRW4	N	Y	Declared 10/1/2005
Brentwood	BRW6	N	Y	Declared 10/1/2005
Brentwood	BRW5	N	Y	Declared 10/1/2005
Brentwood	BRW1	N	Y	Declared 10/1/2005
Brentwood	BRW7	N	Y	Declared 10/1/2005
Brighton and Hove	Brighton and Hove AQMA	N	Y	Declared 8/12/2004
Broxbourne	Teresa Gardens	N	Y	Declared 1/3/2004
Broxbourne	Kennels and Cattery	N	Y	Declared 1/3/2004
Dover	A20 AQMA	N	Y	Declared 15/10/2004
Hertsmere	Hertsmere AQMA No. 5	N	Y	Declared 1/1/2005
Hertsmere	Hertsmere AQMA No. 6	N	Y	Declared 1/1/2005
Maidstone	Maidstone Town centre	N	Y	Declared 1/1/2005
Mid Devon	Crediton AQMA	N	Y	Declared 8/1/2004
Newcastle City Council	Newcastle upon Tyne AQMA No.1	N	Y	Declared 1/4/2004
Rotherham	Rotherham AQMA 1 - Part 3 (NO <sub>2</sub> )	N	Y	Declared 19/11/2004
Rotherham	Fitzwilliam Road (NO <sub>2</sub> ) AQMA	N	Y	Declared 19/11/2004
Rotherham	Wortley Road (NO <sub>2</sub> ) AQMA	N	Y	Declared 19/11/2004
Rotherham	Wellgate (NO <sub>2</sub> ) AQMA	N	Y	Declared 19/11/2004
Salisbury	Exeter Street, Salisbury	N	Y	Declared 16/2/2005
Salisbury	King Street (Warminster Road) (A36), Wilton	N	Y	Declared 16/2/2005
South Bedfordshire	South Bedfordshire AQMA	N	Y	Declared 17/1/2005

Appendix 7. Table 9: 2005 AQMAs dataset with corresponding Zone/Agglomeration

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
10	Barnsley	6	Barnsley AQMA	yes			Yorkshire & Humberside	UK0034	<lv	>lv
15	Bath And North East Somerset	7	Bath AQMA	yes			South West	UK0030	<lv	>lv
18	Birmingham	187	Birmingham AQMA	yes			West Midlands	UK0035	<lv	>lv
							West Midlands Urban Area	UK0002	<lv	>lv
		66	AQMA1	yes			East Midlands	UK0032	<lv	>lv
		67	AQMA2	yes			Leicester Urban Area	UK0011	<lv	>lv
							East Midlands	UK0032	<lv	>lv
19	Blaby	68	AQMA3	yes			East Midlands	UK0032	<lv	>lv
							Leicester Urban Area	UK0011	<lv	>lv
23	Bolsover	8	South Normanton AQMA	yes			East Midlands	UK0032	<lv	>lv
							North West & Merseyside	UK0033	<lv	>lv
24	Bolton	137	Bolton AQMA	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
							South East	UK0031	<lv	>lv
26	Spelthorne	54	Spelthorne AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv
27	Boston	9	Boston AQMA	yes			East Midlands	UK0032	<lv	>lv
		268	BRW1	yes			Eastern	UK0029	<lv	>lv
		269	BRW2	yes			Eastern	UK0029	<lv	>lv
		270	BRW3	yes			Eastern	UK0029	<lv	>lv
		271	BRW4	yes			Eastern	UK0029	<lv	>lv
		272	BRW5	yes			Eastern	UK0029	<lv	>lv
		273	BRW6	yes			Eastern	UK0029	<lv	>lv
33	Brentwood	274	BRW7	yes			Eastern	UK0029	<lv	>lv
35	Brighton and Hove	254	Brighton and Hove AQMA	yes			Brighton/Worthing/Littlehampton	UK0010	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
36	Bristol City Council	10	Bristol AQMA	yes			South West	UK0030	<lv	>lv
							Bristol Urban Area	UK0009	<lv	>lv
38	Bromsgrove	114	Lickley End AQMA	yes			West Midlands	UK0035	<lv	>lv
							Eastern	UK0029	<lv	>lv
		11	Arlington Crescent	yes			Greater London Urban Area	UK0001	>lv	>lv
							Eastern	UK0029	<lv	>lv
		231	Teresa Gardens	yes			Greater London Urban Area	UK0001	>lv	>lv
39	Broxbourne	232	Kennels and Cattery	yes			Eastern	UK0029	<lv	>lv
							North West & Merseyside	UK0033	<lv	>lv
42	Bury	154	Bury AQMA	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
		15	Loughborough AQMA	yes			East Midlands	UK0032	<lv	>lv
52	Charnwood	17	Syston AQMA	yes			Leicester Urban Area	UK0011	<lv	>lv
63	City Of York	88	York AQMA	yes			Yorkshire & Humberside	UK0034	<lv	>lv
64	Colchester	18	Colchester AQMA	yes			Eastern	UK0029	<lv	>lv
		215	AQMA No.1	yes			Coventry/Bedworth	UK0017	<lv	>lv
69	Coventry City Council	216	AQMA No.2	yes			Coventry/Bedworth	UK0017	<lv	>lv
							South East	UK0031	<lv	>lv
75	Dartford	19	Dartford AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv
77	Derby City Council	20	Derby AQMA No.1	yes			East Midlands	UK0032	<lv	>lv
		89	Market Place Area	yes			Yorkshire & Humberside	UK0034	<lv	>lv
		90	A1(M)/Warmsworth Road Junction, Balby Road Area	yes			Yorkshire & Humberside	UK0034	<lv	>lv
		91	Carr House Road Area	yes			Yorkshire & Humberside	UK0034	<lv	>lv
80	Doncaster	502	M18/A638 Hatchell Wood Cantley.	yes			Yorkshire & Humberside	UK0034	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly	
81	Dover	248	A20 AQMA	yes			South East	UK0031	<lv	>lv	
82	Dudley	190	Brierley Hill AQMA	yes			West Midlands Urban Area	UK0002	<lv	>lv	
101	Erewash	118	AQMA No.1	yes			Nottingham Urban Area	UK0008	<lv	>lv	
		119	AQMA No.2	yes			East Midlands	UK0032	<lv	>lv	
							Nottingham Urban Area	UK0008	<lv	>lv	
							South East	UK0031	<lv	>lv	
113	Gravesham	70	Gravesham A2 AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv	
118	Harborough	138	Lutterworth AQMA	yes			East Midlands	UK0032	<lv	>lv	
126	Herefordshire Council	22	Hereford AQMA	yes			West Midlands	UK0035	<lv	>lv	
127	Hertsmere	165	Hertsmere AQMA No. 1	yes			Eastern	UK0029	<lv	>lv	
		204	Hertsmere AQMA No. 2	yes			Eastern	UK0029	<lv	>lv	
		205	Hertsmere AQMA No. 3	yes			Eastern	UK0029	<lv	>lv	
		206	Hertsmere AQMA No. 4	yes				Eastern	UK0029	<lv	>lv
								Greater London Urban Area	UK0001	>lv	>lv
								Eastern	UK0029	<lv	>lv
		307	Hertsmere AQMA No. 5	yes				Eastern	UK0029	<lv	>lv
308	Hertsmere AQMA No. 6	yes				Eastern	UK0029	<lv	>lv		
138	King's Lynn & West Norfolk	221	Railway Road AQMA	yes			Eastern	UK0029	<lv	>lv	
142	Lancaster City Council	230	City of Lancaster AQMA	yes			North West & Merseyside	UK0033	<lv	>lv	
143	Leeds City Council	73	AQMA 1 Ebor Gardens	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	
		513	AQMA 3 Crispin House, New York Road	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	
		514	AQMA 4 Caspar Apartments, 55 North Street	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	
		515	AQMA 5 Oatland Heights	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	
		516	AQMA 6 Marlborough Grange	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	
		517	AQMA 7 Dewsbury Road	yes			West Yorkshire Urban Area	UK0004	<lv	>lv	



LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
144	Leicester City Council	35	Leicester AQMA	yes			East Midlands	UK0032	<lv	>lv
							Leicester Urban Area	UK0011	<lv	>lv
148	Lincoln City Council	75	Lincoln AQMA	yes			East Midlands	UK0032	<lv	>lv
149	Liverpool City Council	211	Liverpool City Centre AQMA	yes			North West & Merseyside	UK0033	<lv	>lv
			Liverpool M62/Rocket Junction AQMA	yes			Liverpool Urban Area	UK0006	<lv	>lv
		212		yes			Liverpool Urban Area	UK0006	<lv	>lv
150	Luton Borough Council	222	Luton AQMA	yes			Eastern	UK0029	<lv	>lv
152	Maidstone	85	Maidstone AQMA	yes			South East	UK0031	<lv	>lv
		317	Maidstone Town centre	yes	yes		South East	UK0031	<lv	>lv
155	Manchester City Council	36	Manchester AQMA	yes			North West & Merseyside	UK0033	<lv	>lv
							Greater Manchester Urban Area	UK0003	<lv	>lv
157	Medway Council	87	Chatham Centre AQMA	yes			South East	UK0031	<lv	>lv
		233	Cuxton Road AQMA	yes			South East	UK0031	<lv	>lv
		234	Frindsbury Hill AQMA	yes			South East	UK0031	<lv	>lv
		235	Maidstone Road AQMA	yes			South East	UK0031	<lv	>lv
		236	Rochester Centre AQMA	yes			South East	UK0031	<lv	>lv
		237	Strood Centre AQMA:	yes			South East	UK0031	<lv	>lv
161	Mid Devon	246	Crediton AQMA	yes			South West	UK0030	<lv	>lv
169	Newcastle City Council	238	Newcastle upon Tyne AQMA No.1	yes			Tyneside	UK0005	<lv	>lv
183	North Warwickshire	38	Stonebridge AQMA	yes			West Midlands	UK0035	<lv	>lv
		41	AQMA 2: Kegworth A6	yes			East Midlands	UK0032	<lv	>lv
184	North West Leicestershire	44	AQMA 1: Vicinity of M1 (South-bound)	yes			East Midlands	UK0032	<lv	>lv
186	Northampton	179	Northampton AQMA 1	yes			East Midlands	UK0032	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
187	Norwich City Council	207	Norwich City Council AQMA No.1 (St Augustines)	yes			Eastern	UK0029	<lv	>lv
		208	Norwich City Council AQMA No.2 (Grapes Hill)	yes			Eastern	UK0029	<lv	>lv
		209	Norwich City Council AQMA No.3 (Castle AQMA)	yes			Eastern	UK0029	<lv	>lv
188	Nottingham City Council	112	No.2	yes			Nottingham Urban Area	UK0008	<lv	>lv
		113	No.3	yes			Nottingham Urban Area	UK0008	<lv	>lv
190	Oadby & Wigston	161	Area 1	yes			Leicester Urban Area	UK0011	<lv	>lv
							East Midlands	UK0032	<lv	>lv
		162	Area 2	yes			Leicester Urban Area	UK0011	<lv	>lv
		163	Area 3	yes			Leicester Urban Area	UK0011	<lv	>lv
		164	Area 4	yes			Leicester Urban Area	UK0011	<lv	>lv
191	Oldham	103	Oldham AQMA	yes			North West & Merseyside	UK0033	<lv	>lv
192	Oswestry	210	Oswestry AQMA	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
193	Oxford City Council	45	Oxford AQMA	yes			West Midlands	UK0035	<lv	>lv
204	Reigate And Banstead	149	AQMA No.1	yes			South East	UK0031	<lv	>lv
		150	AQMA No. 2	yes			South East	UK0031	<lv	>lv
		228	AQMA No.3	yes			South East	UK0031	<lv	>lv
209	Rochdale	157	Area 1	yes			North West & Merseyside	UK0033	<lv	>lv
							Greater Manchester Urban Area	UK0003	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly	
213	Rotherham	46	Rotherham AQMA 1 - Part1 (NO2)	yes			Yorkshire & Humberside	UK0034	<lv	>lv	
							Sheffield Urban Area	UK0007	<lv	>lv	
		47	Rotherham AQMA 1 - Part 2 (NO2)	yes			Sheffield Urban Area	UK0007	<lv	>lv	
		218	Rotherham AQMA 1 - Part 3 (NO2)	yes			Yorkshire & Humberside	UK0034	<lv	>lv	
		257	Fitzwilliam Road (NO2) AQMA	yes			Sheffield Urban Area	UK0007	<lv	>lv	
		258	Wellgate (NO2) AQMA	yes			Sheffield Urban Area	UK0007	<lv	>lv	
		259	Wortley Road (NO2) AQMA	yes			Yorkshire & Humberside	UK0034	<lv	>lv	
215	Runnymede	48	Area 1	yes			South East	UK0031	<lv	>lv	
							Greater London Urban Area	UK0001	>lv	>lv	
		49	Area 2	yes				South East	UK0031	<lv	>lv
								Greater London Urban Area	UK0001	>lv	>lv
220	Salford City Council	134	Salford AQMA	yes			North West & Merseyside	UK0033	<lv	>lv	
							Greater Manchester Urban Area	UK0003	<lv	>lv	
221	Salisbury	104	Brown Street & Winchester Street, Salisbury (amended)	yes			South West	UK0030	<lv	>lv	
		105	Fisherton Street, Salisbury	yes			South West	UK0030	<lv	>lv	
		106	Milford Street, Salisbury	yes			South West	UK0030	<lv	>lv	
		107	Minster Street, Salisbury	yes			South West	UK0030	<lv	>lv	
		217	Klng Street (Warminster Road) (A36), Wilton	yes			South West	UK0030	<lv	>lv	
		285	Exeter Street, Salisbury	yes			South West	UK0030	<lv	>lv	

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
222	Sandwell	169	Oldbury AQMA	yes			West Midlands Urban Area	UK0002	<lv	>lv
							West Midlands	UK0035	<lv	>lv
		170	Yew Tree AQMA	yes			West Midlands Urban Area	UK0002	<lv	>lv
		171	Great Barr NW	yes			West Midlands	UK0035	<lv	>lv
							West Midlands Urban Area	UK0002	<lv	>lv
							West Midlands	UK0035	<lv	>lv
		172	Great Barr South	yes			West Midlands Urban Area	UK0002	<lv	>lv
							West Midlands	UK0035	<lv	>lv
		173	Great Barr SE	yes			West Midlands Urban Area	UK0002	<lv	>lv
		174	Great Barr SW	yes			West Midlands Urban Area	UK0002	<lv	>lv
228	Sevenoaks	144	No.1 (M20 AQMA)	yes			South East	UK0031	<lv	>lv
		145	No.2 (M25 AQMA)	yes			South East	UK0031	<lv	>lv
		146	No.3 (M26 AQMA)	yes			South East	UK0031	<lv	>lv
		147	No.4 (A20(T) AQMA)	yes			South East	UK0031	<lv	>lv
		148	No. 5 (Riverhead AQMA)	yes			South East	UK0031	<lv	>lv
229	Sheffield City Council	51	City Centre Air Action Zone	yes			Sheffield Urban Area	UK0007	<lv	>lv
							Yorkshire & Humberside	UK0034	<lv	>lv
		52	M1 Corridor Air Action Zone	yes			Sheffield Urban Area	UK0007	<lv	>lv
231	Shrewsbury & Atcham	191	AQMA No.1	yes			West Midlands	UK0035	<lv	>lv
		192	AQMA No.2	yes			West Midlands	UK0035	<lv	>lv
		193	AQMA No.3	yes			West Midlands	UK0035	<lv	>lv
234	South Bedfordshire	266	South Bedfordshire AQMA	yes			Eastern	UK0029	<lv	>lv
235	South Bucks						Eastern	UK0029	<lv	>lv
							South East	UK0031	<lv	>lv
		247	South Bucks AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv
242	South Kesteven	123	No. 1 Wharf Road	yes			East Midlands	UK0032	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
243	South Lakeland	128	Kendal AQMA	yes			North West & Merseyside	UK0033	<lv	>lv
246	South Oxfordshire	177	Henley AQMA	yes			South East	UK0031	<lv	>lv
249	South Somerset	168	Yeovil AQMA	yes			South West	UK0030	<lv	>lv
							North West & Merseyside	UK0033	<lv	>lv
260	Stockport	81	Stockport AQMA	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
262	Stoke-On-Trent City Council	126	Stoke AQMA	yes			The Potteries	UK0014	<lv	>lv
267	Surrey Heath	133	Surrey Heath AQMA	yes			South East	UK0031	<lv	>lv
							North West & Merseyside	UK0033	<lv	>lv
270	Tameside	109	Tameside AQMAs	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
	Taunton	189	East Reach AQMA	yes			South West	UK0030	<lv	>lv
273	Deane	198	Henlade AQMA	yes			South West	UK0030	<lv	>lv
							Eastern	UK0029	<lv	>lv
		56	Chorley Wood NO2 AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv
		58	Chandlers Cross NO2 AQMA	yes			Eastern	UK0029	<lv	>lv
							Eastern	UK0029	<lv	>lv
281	Three Rivers	60	Kings Langley NO2 AQMA	yes			Greater London Urban Area	UK0001	>lv	>lv
282	Thurrock	86	Thurrock AQMA	yes			Eastern	UK0029	<lv	>lv
283	Tonbridge & Malling	61	Tonbridge and Malling AQMA	yes			South East	UK0031	<lv	>lv
							North West & Merseyside	UK0033	<lv	>lv
286	Trafford	84	Trafford AQMA	yes			Greater Manchester Urban Area	UK0003	<lv	>lv

LA ID	LOCAL AUTHORITY	AQMA ID	TITLE	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	Zone name	Zone code	NO <sub>2</sub> hourly	NO <sub>2</sub> yearly
292	Wakefield City	225	Wakefield M1 AQMA	yes			Yorkshire & Humberside	UK0034	<lv	>lv
			Wakefield West Park Terrace AQMA				West Yorkshire Urban Area	UK0004	<lv	>lv
		226	Wakefield West Park Terrace AQMA	yes			Yorkshire & Humberside	UK0034	<lv	>lv
293	Walsall						West Midlands	UK0035	<lv	>lv
		199	AQMA No.1	yes			West Midlands Urban Area	UK0002	<lv	>lv
		200	AQMA No.2	yes			West Midlands Urban Area	UK0002	<lv	>lv
							West Midlands	UK0035	<lv	>lv
		201	AQMA No.3	yes			West Midlands Urban Area	UK0002	<lv	>lv
							West Midlands	UK0035	<lv	>lv
		202	AQMA No.4	yes			West Midlands Urban Area	UK0002	<lv	>lv
					West Midlands	UK0035	<lv	>lv		
		203	AQMA No.5	yes			West Midlands Urban Area	UK0002	<lv	>lv
295	Warrington	64	Warrington AQMA	yes			North West & Merseyside	UK0033	<lv	>lv
311	West Wiltshire	62	Westbury AQMA	yes			South West	UK0030	<lv	>lv
		63	Bradford-on-Avon AQMA	yes			South West	UK0030	<lv	>lv
313	Wigan Council						North West & Merseyside	UK0033	<lv	>lv
		110	Wigan AQMAs	yes			Greater Manchester Urban Area	UK0003	<lv	>lv
314	Winchester City Council	220	Winchester Town Centre AQMA	yes			South East	UK0031	<lv	>lv
318	Wokingham						South East	UK0031	<lv	>lv
		129	Wokingham AQMA	yes			Reading/Wokingham Urban Area	UK0016	<lv	>lv
323	Wycombe	65	Wycombe AQMA	yes			South East	UK0031	<lv	>lv
325	Wyre Forest	213	Horsefair AQMA	yes			West Midlands	UK0035	<lv	>lv
		214	Welch Gate AQMA	yes			West Midlands	UK0035	<lv	>lv

**Appendix 7. Table 10: Local authority reports obtained indicating whether they include Monitoring data, updates on AQAP Actions or Both**

Local Authority	Draft AQAP	AQAP 1 date	AQAP 2 date	AQAP 3 date	AQAP PR 2004	AQAP PR 2005	AQAP PR 2006	AQAP PR 2007	AQAP PR 2008	AQAP PR 2009	AQAP PR 2010	AQAP PR 2011	USA 2003	USA 2006	USA 2009
Barnsley MBC	Jul-03	N/A	Apr-10		Actions	Both	Actions	Actions	Both	Actions	Monitoring		N/A	Monitoring	Monitoring
Bath & NE Somerset Council	N/A	N/A	N/A	Feb-11			N/A	N/A			N/A		N/A	N/A	N/A
Birmingham City Council	N/A	Jan-06	N/A	Apr-11	Monitoring	Monitoring		N/A			Monitoring		Monitoring	Monitoring	Monitoring
Blaby DC	May-04	N/A				Both		Actions	N/A	N/A	N/A		N/A	Monitoring	N/A
Bolsover DC	N/A	Aug-04				N/A	N/A		N/A	N/A	N/A		Monitoring	Monitoring	N/A
Bolton MBC	N/A	2004	2006			Both	N/A	N/A	Actions				N/A	N/A	N/A
Spelthorne BC	N/A	Jan-05				Both	N/A	Both	N/A		Both		Monitoring	Both	Monitoring
Boston BC	N/A	May-06	2010				N/A	N/A		N/A	Both		N/A	Monitoring	Monitoring
Bristol City Council	N/A	Apr-04				N/A		Actions	Both	N/A	Both	Both	N/A	Both	Monitoring
Bromsgrove DC	N/A	N/A				N/A	N/A	Actions	Both		Monitoring		N/A	N/A	Monitoring
Broxbourne BC	N/A	Feb-04				Both	N/A						Monitoring	N/A	N/A
Bury MBC	N/A	2004	2006			Both	N/A	N/A	Actions	N/A			N/A	N/A	N/A
Charnwood BC	Jul-04	Sep-06				Both		Both	Monitoring		Both		Monitoring	Monitoring	Monitoring
York City Council	N/A	2006				Both		Both	Both		Both	Both	Monitoring	Monitoring	Monitoring
Colchester BC	Jan-03	Jul-04	Sep-07			N/A					Monitoring		Monitoring	Monitoring	N/A
Coventry City Council	Dec-05	Aug-07							Monitoring				N/A	Monitoring	Monitoring
Dartford BC	N/A	Sep-02			N/A	Both	N/A	Actions	Both	Actions	N/A		Monitoring	Monitoring	Monitoring
Derby City Council	N/A	Apr-06											Monitoring	Both	N/A
Doncaster MBC	2003	N/A							Both		Both		N/A	N/A	Monitoring

Local Authority	Draft AQAP	AQAP 1 date	AQAP 2 date	AQAP 3 date	AQAP PR 2004	AQAP PR 2005	AQAP PR 2006	AQAP PR 2007	AQAP PR 2008	AQAP PR 2009	AQAP PR 2010	AQAP PR 2011	USA 2003	USA 2006	USA 2009
Dudley MBC	N/A	N/A	Mar-11		Monitoring	Monitoring			Both		Both		Monitoring	Monitoring	Monitoring
Erewash BC	N/A	N/A	N/A							N/A			N/A	Monitoring	Monitoring
Gravesham BC	Jan-04	Jul-04	Jul-06		Both			N/A	Both		Both		N/A	Monitoring	Monitoring
Harborough DC	Jun-04	Mar-06	no date		Monitoring	Both		Both	Monitoring		Both		Neither	Monitoring	Monitoring
Herefordshire Council	Oct-05	Apr-08				Monitoring			Monitoring		N/A		Monitoring	Monitoring	Monitoring
Hertsmere BC	Jan-03	N/A								N/A			Monitoring	N/A	N/A
King's Lynn and W Norfolk BC	N/A	N/A			Monitoring			Monitoring			Monitoring		Monitoring	Monitoring	Monitoring
Lancaster City Council	04/09/2007	N/A						Monitoring	Both		Monitoring		N/A	Monitoring	Monitoring
Leeds City Council	N/A	Jan-04						Both			Both		N/A	N/A	Monitoring
Leicester City Council	May-04	01/04/2011				N/A		Actions	Monitoring				N/A	N/A	Monitoring
Lincoln City Council	N/A	Jan-06			Monitoring	Monitoring			Monitoring				N/A	Monitoring	Monitoring
Liverpool City Council	Dec-04	Jun-07											N/A	N/A	N/A
Luton BC	no date	no date				Monitoring		Monitoring	Monitoring		Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Maidstone BC	Jun-03	Feb-07	Apr-10	Dec-10		N/A	N/A		N/A		Both		Monitoring	N/A	Monitoring
Manchester City Council	N/A	2004	2006	2010		Both	N/A	N/A	Actions	Actions	Actions		N/A	N/A	Monitoring
Medway Council	N/A	Jul-05				N/A	N/A	N/A	N/A	N/A	Both		N/A	N/A	Monitoring
N Warwickshire BC	N/A	2003				N/A	N/A	Monitoring			Both		N/A	Monitoring	Monitoring
NW Leicestershire DC	Dec-05					Both		Both	Both		Both	Both	Monitoring	Monitoring	Monitoring



Local Authority	Draft AQAP	AQAP 1 date	AQAP 2 date	AQAP 3 date	AQAP PR 2004	AQAP PR 2005	AQAP PR 2006	AQAP PR 2007	AQAP PR 2008	AQAP PR 2009	AQAP PR 2010	AQAP PR 2011	USA 2003	USA 2006	USA 2009
Northampton BC	Apr-05	N/A									N/A		N/A	Monitoring	N/A
Norwich City Council	Mar-04	N/A			Monitoring	Both		Both			Both		Monitoring	Monitoring	Monitoring
Nottingham City Council	Mar-06					Both			Both		Both		Monitoring	Monitoring	Monitoring
Oadby & Wigston DC	Mar-04	N/A						Monitoring			Monitoring		N/A	N/A	Monitoring
Oldham MBC	N/A	2004	2006			Both	N/A	N/A	Actions				N/A	N/A	N/A
Oswestry BC	no date	N/A											N/A	N/A	N/A
Oxford City Council	N/A	Apr-06				Monitoring					N/A		Monitoring	Monitoring	Monitoring
Reigate and Banstead BC	Apr-04	Jan-07	2009			Both			Both		Both	Both	Monitoring	Monitoring	Monitoring
Rochdale MBC	N/A	2004	2006			Both	N/A	Both	Actions	N/A			N/A	N/A	N/A
Rotherham MBC	N/A	N/A	N/A			N/A	N/A	Actions	N/A	N/A	N/A		N/A	N/A	Monitoring
Runnymede BC	May-04	2008							Both		Both		Monitoring	Monitoring	Monitoring
Rushmoor BC	May-06					Monitoring			Monitoring	N/A	Both		Monitoring	Monitoring	Monitoring
Salford MBC	N/A	2004	2006			Both	N/A	Both	Both	Both	Both		N/A	Monitoring	Monitoring
Salisbury DC	no date	N/A				Both			Monitoring	Actions	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sandwell MBC	Feb-05	Jul-07	Sep-09			Monitoring		Monitoring	Monitoring		Both		Monitoring	Monitoring	Monitoring
Sevenoaks DC	N/A	2009						N/A	N/A		N/A		N/A	N/A	Monitoring
Sheffield City Council	Apr-03	N/A				N/A	Actions		N/A	Actions	Both		N/A	N/A	Monitoring
Shrewsbury & Atcham BC	N/A	N/A											N/A	N/A	N/A

Local Authority	Draft AQAP	AQAP 1 date	AQAP 2 date	AQAP 3 date	AQAP PR 2004	AQAP PR 2005	AQAP PR 2006	AQAP PR 2007	AQAP PR 2008	AQAP PR 2009	AQAP PR 2010	AQAP PR 2011	USA 2003	USA 2006	USA 2009
S Bucks DC	Mar-06	N/A						Monitoring	Monitoring		N/A		Monitoring	N/A	Monitoring
S Kesteven DC	Nov-03	Jun-05						N/A	N/A		N/A		N/A	Monitoring	Monitoring
S Lakeland DC	Apr-02	N/A			Both	Both	N/A	Both	Both	N/A	N/A	Both	N/A	Both	Both
S Northamptonshire Council	18/10/2008	N/A							Monitoring	N/A	Monitoring	Actions	N/A	N/A	Monitoring
S Oxfordshire DC	N/A	N/A							N/A	N/A	Both		N/A	N/A	Monitoring
S Somerset DC	N/A	N/A						Both	Both	N/A	N/A		N/A	N/A	Monitoring
St Albans DC	Dec-03	N/A				Monitoring		Monitoring		N/A	N/A		Monitoring	Monitoring	Monitoring
Stockport MBC	N/A	2004	2006			Both	N/A	N/A	Actions	N/A	N/A		N/A	N/A	N/A
Stoke-on-Trent City Council	N/A	Apr-09									Both	Both	N/A	N/A	Monitoring
Surrey County Council/Surrey Heath BC	Jun-05						Monitoring	Actions	Both	Both	Both		N/A	Monitoring	Monitoring
Swale BC	16/11/2010				Monitoring	Monitoring					Monitoring		Monitoring	N/A	N/A
Tameside MBC	N/A	2004	2006			Both	N/A	N/A	Both	N/A			N/A	N/A	N/A
Taunton Deane BC	N/A	N/A				Both		Both	Both				N/A	Monitoring	Monitoring
Three Rivers DC	Apr-04	N/A				N/A							N/A	Monitoring	N/A
Thurrock Council	N/A	Nov-04						Both	Both		N/A		Monitoring	Monitoring	Monitoring

Local Authority	Draft AQAP	AQAP 1 date	AQAP 2 date	AQAP 3 date	AQAP PR 2004	AQAP PR 2005	AQAP PR 2006	AQAP PR 2007	AQAP PR 2008	AQAP PR 2009	AQAP PR 2010	AQAP PR 2011	USA 2003	USA 2006	USA 2009
Tonbridge and Malling BC	N/A	Feb-03				Both			Both		Both		Monitoring	Monitoring	N/A
Trafford MBC	N/A	2004	2006			Both	N/A	N/A	Actions	N/A			N/A	Both	N/A
Wakefield MDC	N/A	Jun-08							N/A		N/A		N/A	N/A	N/A
Walsall MBC	N/A	Dec-08	Feb-09						Monitoring		Monitoring		Monitoring	Monitoring	Monitoring
Warrington BC	N/A	Aug-03			N/A	Both	N/A	Actions	N/A	N/A	Both		N/A	N/A	Monitoring
Wiltshire DC	Sep-05	N/A			Monitoring			Both	N/A	Actions	Monitoring	Monitoring	Monitoring	N/A	Monitoring
Wigan MBC	N/A	2004	2006			Both	N/A	N/A	Actions	N/A			N/A	N/A	N/A
Winchester City Council	N/A	Apr-06				Monitoring		Both	Monitoring		Actions	Monitoring	N/A	Monitoring	Monitoring
Wokingham DC	Dec-04				Monitoring			Monitoring	Monitoring		Both	Monitoring	Monitoring	Monitoring	Monitoring
Wycombe DC	Sep-02	N/A			Both	Actions	N/A	Monitoring	Both		Both	Both	N/A	Monitoring	Monitoring
Wyre Forest DC	Oct-04				Monitoring	Monitoring			Monitoring		Both		Monitoring	Monitoring	Monitoring

**Key:** Monitoring data, updates on AQAP Actions or Both

**Appendix 7. Table 11: Local authorities meeting Criteria 1: Compliance with Action Plan Progress Reporting requirements**

LA ID	LA name	Draft AQAP	AQAP1 date	AQAP2 date	AQAP3 date
10	Barnsley Metropolitan Borough Council	Jul-03	Oct-04	Apr-10	N/A
18	Birmingham City Council	Jun-04	Jan-06	No report	Apr-11
19	Blaby District Council	May-04	No report	N/A	N/A
23	Bolsover District Council	No report	Aug-04	N/A	N/A
24	Bolton Metropolitan Borough Council	No report	2004	2006	N/A
26	Spelthorne Borough Council	No report	Jan-05	N/A	N/A
27	Boston Borough Council	2004	May-06	01/01/2010	N/A
36	Bristol City Council	No report	Apr-04	N/A	N/A
38	Bromsgrove District Council	Mar-04	Apr-13	N/A	N/A
52	Charnwood Borough Council	Jul-04	Sep-06	N/A	N/A
63	York City Council	2004	01/01/2006	N/A	N/A
64	Colchester Borough Council	Jan-03	Jul-04	Sep-07	N/A
69	Coventry City Council	Dec-05	Aug-07	N/A	N/A
75	Dartford Borough Council	No report	Sep-02	N/A	N/A
80	Doncaster Metropolitan Borough Council	2003	No report	N/A	N/A
82	Dudley Metropolitan Borough Council	22/10/2004	No report	Mar-11	N/A
101	Erewash Borough Council	Sep-03	No report	No report	N/A
113	Gravesham Borough Council	Jan-04	Apr-04	Jul-04	Jul-06
118	Harborough District Council	Jun-04	Mar-06	no date	N/A
126	Herefordshire Council	Oct-05	Apr-08	N/A	N/A
143	Leeds City Council	No report	Jan-04	N/A	N/A
144	Leicester City Council	May-04	Sep-04	01/04/2011	N/A
149	Liverpool City Council	Dec-04	Jun-07	17/01/2011	N/A
152	Maidstone Borough Council	Jun-03	Feb-07	Apr-10	Dec-10
155	Manchester City Council	No report	2004	2006	2010
157	Medway Council	No report	Jul-05	N/A	N/A
169	Newcastle City Council	17/11/2005	13/01/2006	N/A	N/A
183	North Warwickshire Borough Council	No report	2003	N/A	N/A
184	North West Leicestershire District Council	Dec-05	N/A	N/A	N/A

LA ID	LA name	Draft AQAP	AQAP1 date	AQAP2 date	AQAP3 date
187	Norwich City Council	Mar-04	No report	N/A	N/A
193	Oxford City Council	Jul-05	Apr-06	N/A	N/A
204	Reigate and Banstead Borough Council	Apr-04	Jan-07	2009	N/A
213	Rotherham Metropolitan Borough Council	Jul-03	No report	May-07	N/A
215	Runnymede Borough Council	May-04	2008	N/A	N/A
220	Salford Metropolitan Borough Council	No report	2004	2006	N/A
221	Salisbury District Council	2003	2004	N/A	N/A
222	Sandwell Metropolitan Borough Council	Feb-05	Jul-07	Sep-09	N/A
228	Sevenoaks District Council	Aug-05	01/01/2009	N/A	N/A
229	Sheffield City Council	Apr-03	No report	N/A	N/A
242	South Kesteven District Council	Nov-03	Jun-05	N/A	N/A
243	South Lakeland District Council	Apr-02	No report	N/A	N/A
249	South Somerset District Council	2004	No report	N/A	N/A
267	Surrey County Council/Surrey Heath BC	Jun-05	N/A	N/A	N/A
270	Tameside Metropolitan Borough Council	No report	2004	2006	N/A
273	Taunton Deane Borough Council	2004	No report	N/A	N/A
282	Thurrock Council	No report	Nov-04	N/A	N/A
283	Tonbridge and Malling Borough Council	No report	Feb-03	N/A	N/A
286	Trafford Metropolitan Borough Council	No report	2004	2006	N/A
292	Wakefield Metropolitan District Council	Aug-05	Jun-08	N/A	N/A
295	Warrington Borough Council	No report	Aug-03	N/A	N/A
311	West Wiltshire District Council	Sep-05	No report	N/A	N/A
314	Winchester City Council	Jul-05	Apr-06	N/A	N/A
318	Wokingham District Council	Dec-04	N/A	N/A	N/A
323	Wycombe District Council	Sep-02	No report	N/A	N/A
325	Wyre Forest District Council	Oct-04	Apr-13	N/A	N/A

## Appendix 7. Box 1: R script to convert AURN data from 'long' to 'wide' format

```
#set working directory
setwd("E:\\PhD\\PhD\\Method\\AURN_sites\\")

#add data files
AURN_NO2<-read.csv("AURN_NO2_1961-2012.csv", header=TRUE,
na.strings = "n/a")
AURN_DC<-read.csv("AURN_DC_1961-2012.csv", header=TRUE)

summary(AURN_NO2)
head(AURN_NO2)
tail(AURN_NO2)

##convert from 'long' to 'wide'
alldata <- dcast(AURN_NO2, Site.Name ~ Year,
value.var="Annual.Mean")
head(alldata)
tail(alldata)

write.csv(alldata,
file="E:\\PhD\\PhD\\Method\\AURN_sites\\AURN_NO2.csv")
```

**Appendix 7. Table 12: AURN Roadside (traffic) sites < 500 m of 2005 AQMA dataset**

LA ID	Local Authority	AQMA ID	AQMA Title	Traffic Urban Site Name
15	Bath And North East Somerset	7	Bath AQMA	Bath Roadside
36	Bristol City Council	10	Bristol AQMA	Bristol Old Market
193	Oxford City Council	45	Oxford AQMA	Oxford Centre Roadside
42	Bury	154	Bury AQMA	Bury Roadside

**Appendix 7. Table 13: AURN Urban Centre (Background Urban) sites < 5 km of 2005 AQMA dataset**

LA ID	Local Authority	AQMA ID	AQMA Title	Background Urban Site Name
10	Barnsley	6	Barnsley AQMA	Barnsley Gawber
36	Bristol City Council	10	Bristol AQMA	Bristol St Paul's
144	Leicester City Council	35	Leicester AQMA	Leicester Centre
155	Manchester City Council	36	Manchester AQMA	Manchester Piccadilly
26	Spelthorne	54	Spelthorne AQMA	London Teddington
19	Blaby	66	AQMA1	Leicester Centre
19	Blaby	68	AQMA3	Leicester Centre
143	Leeds City Council	73	AQMA 1 Ebor Gardens	Leeds Centre
286	Trafford	84	Trafford AQMA	Manchester Piccadilly
282	Thurrock	86	Thurrock AQMA	Thurrock
191	Oldham	103	Oldham AQMA	Manchester Piccadilly
270	Tameside	109	Tameside AQMAs	Manchester Piccadilly
313	Wigan Council	110	Wigan AQMAs	Wigan Centre
188	Nottingham City Council	112	No.2	Nottingham Centre
188	Nottingham City Council	113	No.3	Nottingham Centre
262	Stoke-On-Trent City Council	126	Stoke AQMA	Stoke-on-Trent Centre
220	Salford City Council	134	Salford AQMA	Manchester Piccadilly
42	Bury	154	Bury AQMA	Manchester Piccadilly
190	Oadby & Wigston	161	Area 1	Leicester Centre
190	Oadby & Wigston	162	Area 2	Leicester Centre
190	Oadby & Wigston	163	Area 3	Leicester Centre
190	Oadby & Wigston	164	Area 4	Leicester Centre

LA ID	Local Authority	AQMA ID	AQMA Title	Background Urban Site Name
222	Sandwell	169	Oldbury AQMA	Sandwell West Bromwich
222	Sandwell	170	Yew Tree AQMA	Sandwell West Bromwich
222	Sandwell	171	Great Barr NW	Sandwell West Bromwich
222	Sandwell	172	Great Barr South	Sandwell West Bromwich
222	Sandwell	174	Great Barr SW	Sandwell West Bromwich
18	Birmingham	187	Birmingham AQMA	Birmingham Tyburn
293	Walsall	201	AQMA No.3	Sandwell West Bromwich
69	Coventry City Council	215	AQMA No.1	Coventry Memorial Park
69	Coventry City Council	216	AQMA No.2	Coventry Memorial Park
169	Newcastle City Council	238	Newcastle upon Tyne AQMA No.1	Newcastle Centre
35	Brighton and Hove	254	Brighton and Hove AQMA	Brighton Preston Park
143	Leeds City Council	513	AQMA 3 Crispin House, New York Road	Leeds Centre
143	Leeds City Council	514	AQMA 4 Caspar Apartments, 55 North Street	Leeds Centre
143	Leeds City Council	515	AQMA 5 Oatland Heights	Leeds Centre
143	Leeds City Council	516	AQMA 6 Marlborough Grange	Leeds Centre
143	Leeds City Council	517	AQMA 7 Dewsbury Road	Leeds Centre

**Appendix 7. Table 14: AURN Rural/Remote (background rural) sites < 50 km of 2005 AQMA dataset**

LA ID	Local Authority	AQMA ID	AQMA Title	Rural/remote Site Name
10	Barnsley	6	Barnsley AQMA	Ladybower
23	Bolsover	8	South Normanton AQMA	Ladybower
52	Charnwood	15	Loughborough AQMA	Market Harborough
52	Charnwood	17	Syston AQMA	Market Harborough
64	Colchester	18	Colchester AQMA	St Osyth
75	Dartford	19	Dartford AQMA	Rochester Stoke
144	Leicester City Council	35	Leicester AQMA	Market Harborough
155	Manchester City Council	36	Manchester AQMA	Ladybower
184	North West Leicestershire	41	AQMA 2: Kegworth A6	Market Harborough
184	North West Leicestershire	44	AQMA 1: Vicinity of M1 (South-bound)	Market Harborough
193	Oxford City Council	45	Oxford AQMA	Harwell



LA ID	Local Authority	AQMA ID	AQMA Title	Rural/remote Site Name
213	Rotherham	46	Rotherham AQMA 1 - Part1 (NO2)	Ladybower
213	Rotherham	47	Rotherham AQMA 1 - Part 2 (NO2)	Ladybower
229	Sheffield City Council	51	City Centre Air Action Zone	Ladybower
229	Sheffield City Council	52	M1 Corridor Air Action Zone	Ladybower
283	Tonbridge & Malling	61	Tonbridge and Malling AQMA	Rochester Stoke
295	Warrington	64	Warrington AQMA	Ladybower
323	Wycombe	65	Wycombe AQMA	Harwell
19	Blaby	66	AQMA1	Market Harborough
19	Blaby	67	AQMA2	Market Harborough
19	Blaby	68	AQMA3	Market Harborough
113	Gravesham	70	Gravesham A2 AQMA	Rochester Stoke
143	Leeds City Council	73	AQMA 1 Ebor Gardens	Ladybower
260	Stockport	81	Stockport AQMA	Ladybower
286	Trafford	84	Trafford AQMA	Ladybower
152	Maidstone	85	Maidstone AQMA	Rochester Stoke
282	Thurrock	86	Thurrock AQMA	Rochester Stoke
157	Medway Council	87	Chatham Centre AQMA	Rochester Stoke
63	City Of York	88	York AQMA	High Muffles
80	Doncaster	89	Market Place Area	Ladybower
80	Doncaster	90	A1(M)/Warmsworth Road Junction, Balby Road Area	Ladybower
80	Doncaster	91	Carr House Road Area	Ladybower
191	Oldham	103	Oldham AQMA	Ladybower
270	Tameside	109	Tameside AQMAs	Ladybower
242	South Kesteven	123	No. 1 Wharf Road	Market Harborough
318	Wokingham	129	Wokingham AQMA	Harwell
267	Surrey Heath	133	Surrey Heath AQMA	Harwell
220	Salford City Council	134	Salford AQMA	Ladybower
24	Bolton	137	Bolton AQMA	Ladybower
118	Harborough	138	Lutterworth AQMA	Market Harborough
228	Sevenoaks	144	No.1 (M20 AQMA)	Rochester Stoke
228	Sevenoaks	145	No.2 (M25 AQMA)	Rochester Stoke
228	Sevenoaks	146	No.3 (M26 AQMA)	Rochester Stoke

LA ID	Local Authority	AQMA ID	AQMA Title	Rural/remote Site Name
228	Sevenoaks	147	No.4 (A20(T) AQMA)	Rochester Stoke
228	Sevenoaks	148	No. 5 (Riverhead AQMA)	Rochester Stoke
204	Reigate And Banstead	150	AQMA No. 2	Lullington Heath
42	Bury	154	Bury AQMA	Ladybower
209	Rochdale	157	Area 1	Ladybower
190	Oadby & Wigston	161	Area 1	Market Harborough
190	Oadby & Wigston	162	Area 2	Market Harborough
190	Oadby & Wigston	163	Area 3	Market Harborough
190	Oadby & Wigston	164	Area 4	Market Harborough
246	South Oxfordshire	177	Henley AQMA	Harwell
186	Northampton	179	Northampton AQMA 1	Market Harborough
231	Shrewsbury & Atcham	191	AQMA No.1	Aston Hill
231	Shrewsbury & Atcham	192	AQMA No.2	Aston Hill
231	Shrewsbury & Atcham	193	AQMA No.3	Aston Hill
192	Oswestry	210	Oswestry AQMA	Aston Hill
213	Rotherham	218	Rotherham AQMA 1 - Part 3 (NO2)	Ladybower
292	Wakefield City	225	Wakefield M1 AQMA	Ladybower
292	Wakefield City	226	Wakefield West Park Terrace AQMA	Ladybower
204	Reigate And Banstead	228	AQMA No.3	Lullington Heath
157	Medway Council	233	Cuxton Road AQMA	Rochester Stoke
157	Medway Council	234	Frindsbury Hill AQMA	Rochester Stoke
157	Medway Council	235	Maidstone Road AQMA	Rochester Stoke
157	Medway Council	236	Rochester Centre AQMA	Rochester Stoke
157	Medway Council	237	Strood Centre AQMA:	Rochester Stoke
161	Mid Devon	246	Crediton AQMA	Yarner Wood
235	South Bucks	247	South Bucks AQMA	Harwell
35	Brighton and Hove	254	Brighton and Hove AQMA	Lullington Heath
213	Rotherham	257	Fitzwilliam Road (NO2) AQMA	Ladybower
213	Rotherham	258	Wellgate (NO2) AQMA	Ladybower
213	Rotherham	259	Wortley Road (NO2) AQMA	Ladybower
33	Brentwood	268	BRW1	Rochester Stoke
33	Brentwood	269	BRW2	Rochester Stoke

LA ID	Local Authority	AQMA ID	AQMA Title	Rural/remote Site Name
33	Brentwood	270	BRW3	Rochester Stoke
33	Brentwood	271	BRW4	Rochester Stoke
33	Brentwood	272	BRW5	Rochester Stoke
33	Brentwood	273	BRW6	Rochester Stoke
33	Brentwood	274	BRW7	Rochester Stoke
152	Maidstone	317	Maidstone Town centre	Rochester Stoke
80	Doncaster	502	M18/A638 Hatchell Wood Cantley.	Ladybower
143	Leeds City Council	513	AQMA 3 Crispin House, New York Road	Ladybower
143	Leeds City Council	514	AQMA 4 Caspar Apartments, 55 North Street	Ladybower
143	Leeds City Council	515	AQMA 5 Oatland Heights	Ladybower
143	Leeds City Council	516	AQMA 6 Marlborough Grange	Ladybower
143	Leeds City Council	517	AQMA 7 Dewsbury Road	Ladybower

**Appendix 7. Table 15: AQMAs with suitability of AURN sites' locations**

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
10	Barnsley	6	Barnsley AQMA	Background Urban only
15	Bath And North East Somerset	7	Bath AQMA	Traffic Urban only
23	Bolsover	8	South Normanton AQMA	No AURN
27	Boston	9	Boston AQMA	No AURN
36	Bristol City Council	10	Bristol AQMA	Traffic & Background Urban
39	Broxbourne	11	Arlington Crescent	No AURN
52	Charnwood	15	Loughborough AQMA	No AURN
52	Charnwood	17	Syston AQMA	No AURN
64	Colchester	18	Colchester AQMA	No AURN
75	Dartford	19	Dartford AQMA	No AURN
77	Derby City Council	20	Derby AQMA No.1	No AURN
126	Herefordshire Council	22	Hereford AQMA	No AURN
144	Leicester City Council	35	Leicester AQMA	Background Urban only
155	Manchester City Council	36	Manchester AQMA	Background Urban only
183	North Warwickshire	38	Stonebridge AQMA	No AURN
184	North West Leicestershire	41	AQMA 2: Kegworth A6	No AURN

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
184	North West Leicestershire	44	AQMA 1: Vicinity of M1 (South-bound)	No AURN
193	Oxford City Council	45	Oxford AQMA	Traffic Urban only
213	Rotherham	46	Rotherham AQMA 1 - Part1 (NO2)	No AURN
213	Rotherham	47	Rotherham AQMA 1 - Part 2 (NO2)	No AURN
215	Runnymede	48	Area 1	No AURN
215	Runnymede	49	Area 2	No AURN
229	Sheffield City Council	51	City Centre Air Action Zone	No AURN
229	Sheffield City Council	52	M1 Corridor Air Action Zone	No AURN
26	Spelthorne	54	Spelthorne AQMA	Background Urban only
281	Three Rivers	56	Chorley Wood NO2 AQMA	No AURN
281	Three Rivers	58	Chandlers Cross NO2 AQMA	No AURN
281	Three Rivers	60	Kings Langley NO2 AQMA	No AURN
283	Tonbridge & Malling	61	Tonbridge and Malling AQMA	No AURN
311	West Wiltshire	62	Westbury AQMA	No AURN
311	West Wiltshire	63	Bradford-on-Avon AQMA	No AURN
295	Warrington	64	Warrington AQMA	No AURN
323	Wycombe	65	Wycombe AQMA	No AURN
19	Blaby	66	AQMA1	Background Urban only
19	Blaby	67	AQMA2	No AURN
19	Blaby	68	AQMA3	Background Urban only
113	Gravesham	70	Gravesham A2 AQMA	No AURN
143	Leeds City Council	73	AQMA 1 Ebor Gardens	Background Urban only
148	Lincoln City Council	75	Lincoln AQMA	No AURN
260	Stockport	81	Stockport AQMA	No AURN
286	Trafford	84	Trafford AQMA	Background Urban only
152	Maidstone	85	Maidstone AQMA	No AURN
282	Thurrock	86	Thurrock AQMA	Background Urban only
157	Medway Council	87	Chatham Centre AQMA	No AURN
63	City Of York	88	York AQMA	No AURN
80	Doncaster	89	Market Place Area	No AURN
80	Doncaster	90	A1(M)/Warmsworth Road Junction, Balby Road Area	No AURN
80	Doncaster	91	Carr House Road Area	No AURN

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
191	Oldham	103	Oldham AQMA	Background Urban only
221	Salisbury	104	Brown Street & Winchester Street, Salisbury (amended)	No AURN
221	Salisbury	105	Fisherton Street, Salisbury	No AURN
221	Salisbury	106	Milford Street, Salisbury	No AURN
221	Salisbury	107	Minster Street, Salisbury	No AURN
270	Tameside	109	Tameside AQMAs	Background Urban only
313	Wigan Council	110	Wigan AQMAs	Background Urban only
188	Nottingham City Council	112	No.2	Background Urban only
188	Nottingham City Council	113	No.3	Background Urban only
38	Bromsgrove	114	Lickley End AQMA	No AURN
101	Erewash	118	AQMA No.1	No AURN
101	Erewash	119	AQMA No.2	No AURN
242	South Kesteven	123	No. 1 Wharf Road	No AURN
262	Stoke-On-Trent City Council	126	Stoke AQMA	Background Urban only
243	South Lakeland	128	Kendal AQMA	No AURN
318	Wokingham	129	Wokingham AQMA	No AURN
267	Surrey Heath	133	Surrey Heath AQMA	No AURN
220	Salford City Council	134	Salford AQMA	Background Urban only
24	Bolton	137	Bolton AQMA	No AURN
118	Harborough	138	Lutterworth AQMA	No AURN
228	Sevenoaks	144	No.1 (M20 AQMA)	No AURN
228	Sevenoaks	145	No.2 (M25 AQMA)	No AURN
228	Sevenoaks	146	No.3 (M26 AQMA)	No AURN
228	Sevenoaks	147	No.4 (A20(T) AQMA)	No AURN
228	Sevenoaks	148	No. 5 (Riverhead AQMA)	No AURN
204	Reigate And Banstead	149	AQMA No.1	No AURN
204	Reigate And Banstead	150	AQMA No. 2	No AURN
42	Bury	154	Bury AQMA	ALL
209	Rochdale	157	Area 1	No AURN
190	Oadby & Wigston	161	Area 1	Background Urban only
190	Oadby & Wigston	162	Area 2	Background Urban only
190	Oadby & Wigston	163	Area 3	Background Urban only

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
190	Oadby & Wigston	164	Area 4	Background Urban only
127	Hertsmere	165	Hertsmere AQMA No. 1	No AURN
249	South Somerset	168	Yeovil AQMA	No AURN
222	Sandwell	169	Oldbury AQMA	Background Urban only
222	Sandwell	170	Yew Tree AQMA	Background Urban only
222	Sandwell	171	Great Barr NW	Background Urban only
222	Sandwell	172	Great Barr South	Background Urban only
222	Sandwell	173	Great Barr SE	No AURN
222	Sandwell	174	Great Barr SW	Background Urban only
246	South Oxfordshire	177	Henley AQMA	No AURN
186	Northampton	179	Northampton AQMA 1	No AURN
18	Birmingham	187	Birmingham AQMA	Background Urban only
273	Taunton Deane	189	East Reach AQMA	No AURN
82	Dudley	190	Brierley Hill AQMA	No AURN
231	Shrewsbury & Atcham	191	AQMA No.1	No AURN
231	Shrewsbury & Atcham	192	AQMA No.2	No AURN
231	Shrewsbury & Atcham	193	AQMA No.3	No AURN
273	Taunton Deane	198	Henlade AQMA	No AURN
293	Walsall	199	AQMA No.1	No AURN
293	Walsall	200	AQMA No.2	No AURN
293	Walsall	201	AQMA No.3	Background Urban only
293	Walsall	202	AQMA No.4	No AURN
293	Walsall	203	AQMA No.5	No AURN
127	Hertsmere	204	Hertsmere AQMA No. 2	No AURN
127	Hertsmere	205	Hertsmere AQMA No. 3	No AURN
127	Hertsmere	206	Hertsmere AQMA No. 4	No AURN
187	Norwich City Council	207	Norwich City Council AQMA No.1 (St Augustines)	No AURN
187	Norwich City Council	208	Norwich City Council AQMA No.2 (Grapes Hill)	No AURN
187	Norwich City Council	209	Norwich City Council AQMA No.3 (Castle AQMA)	No AURN
192	Oswestry	210	Oswestry AQMA	No AURN
149	Liverpool City Council	211	Liverpool City Centre AQMA	No AURN
149	Liverpool City Council	212	Liverpool M62/Rocket Junction AQMA	No AURN

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
325	Wyre Forest	213	Horsefair AQMA	No AURN
325	Wyre Forest	214	Welch Gate AQMA	No AURN
69	Coventry City Council	215	AQMA No.1	Background Urban only
69	Coventry City Council	216	AQMA No.2	Background Urban only
221	Salisbury	217	King Street (Warminster Road) (A36), Wilton	No AURN
213	Rotherham	218	Rotherham AQMA 1 - Part 3 (NO2)	No AURN
314	Winchester City Council	220	Winchester Town Centre AQMA	No AURN
138	King's Lynn & West Norfolk	221	Railway Road AQMA	No AURN
150	Luton Borough Council	222	Luton AQMA	No AURN
292	Wakefield City	225	Wakefield M1 AQMA	No AURN
292	Wakefield City	226	Wakefield West Park Terrace AQMA	No AURN
204	Reigate And Banstead	228	AQMA No.3	No AURN
142	Lancaster City Council	230	City of Lancaster AQMA	No AURN
39	Broxbourne	231	Teresa Gardens	No AURN
39	Broxbourne	232	Kennels and Cattery	No AURN
157	Medway Council	233	Cuxton Road AQMA	No AURN
157	Medway Council	234	Frindsbury Hill AQMA	No AURN
157	Medway Council	235	Maidstone Road AQMA	No AURN
157	Medway Council	236	Rochester Centre AQMA	No AURN
157	Medway Council	237	Strood Centre AQMA:	No AURN
169	Newcastle City Council	238	Newcastle upon Tyne AQMA No.1	Background Urban only
161	Mid Devon	246	Crediton AQMA	No AURN
235	South Bucks	247	South Bucks AQMA	No AURN
81	Dover	248	A20 AQMA	No AURN
35	Brighton and Hove	254	Brighton and Hove AQMA	Background Urban only
213	Rotherham	257	Fitzwilliam Road (NO2) AQMA	No AURN
213	Rotherham	258	Wellgate (NO2) AQMA	No AURN
213	Rotherham	259	Wortley Road (NO2) AQMA	No AURN
234	South Bedfordshire	266	South Bedfordshire AQMA	No AURN
33	Brentwood	268	BRW1	No AURN
33	Brentwood	269	BRW2	No AURN
33	Brentwood	270	BRW3	No AURN

LA ID	Local Authority	AQMA ID	AQMA Title	Suitably located AURN sites
33	Brentwood	271	BRW4	No AURN
33	Brentwood	272	BRW5	No AURN
33	Brentwood	273	BRW6	No AURN
33	Brentwood	274	BRW7	No AURN
221	Salisbury	285	Exeter Street, Salisbury	No AURN
127	Hertsmere	307	Hertsmere AQMA No. 5	No AURN
127	Hertsmere	308	Hertsmere AQMA No. 6	No AURN
152	Maidstone	317	Maidstone Town centre	No AURN
80	Doncaster	502	M18/A638 Hatchell Wood Cantley.	No AURN
143	Leeds City Council	513	AQMA 3 Crispin House, New York Road	Background Urban only
143	Leeds City Council	514	AQMA 4 Caspar Apartments, 55 North Street	Background Urban only
143	Leeds City Council	515	AQMA 5 Oatland Heights	Background Urban only
143	Leeds City Council	516	AQMA 6 Marlborough Grange	Background Urban only
143	Leeds City Council	517	AQMA 7 Dewsbury Road	Background Urban only

**Appendix 7. Table 16: AQMAs with sufficiency of AQAPs and AQAP PRs and suitably located monitoring stations with sufficient data**

LA ID	Local Authority	AQMA ID	AQMA Title	AQMAs with suitably located AURN sites, sufficient monitoring data and sufficient AQAP PRs
10	Barnsley	6	Barnsley AQMA	Background Urban
19	Blaby	67	AQMA2	FALSE
19	Blaby	66	AQMA1	Background Urban
19	Blaby	68	AQMA3	Background Urban
23	Bolsover	8	South Normanton AQMA	FALSE
24	Bolton	137	Bolton AQMA	FALSE
26	Spelthorne	54	Spelthorne AQMA	Background Urban
27	Boston	9	Boston AQMA	FALSE
36	Bristol City Council	10	Bristol AQMA	Traffic & Background Urban
38	Bromsgrove	114	Lickley End AQMA	FALSE



LA ID	Local Authority	AQMA ID	AQMA Title	AQMAs with suitably located AURN sites, sufficient monitoring data and sufficient AQAP PRs
52	Charnwood	15	Loughborough AQMA	FALSE
52	Charnwood	17	Syston AQMA	FALSE
63	City Of York	88	York AQMA	FALSE
64	Colchester	18	Colchester AQMA	FALSE
69	Coventry City Council	215	AQMA No.1	Background Urban
69	Coventry City Council	216	AQMA No.2	Background Urban
75	Dartford	19	Dartford AQMA	FALSE
80	Doncaster	89	Market Place Area	FALSE
80	Doncaster	90	A1(M)/Warmsworth Road Junction, Balby Road Area	FALSE
80	Doncaster	91	Carr House Road Area	FALSE
80	Doncaster	502	M18/A638 Hatchell Wood Cantley.	FALSE
82	Dudley	190	Brierley Hill AQMA	FALSE
101	Erewash	118	AQMA No.1	FALSE
101	Erewash	119	AQMA No.2	FALSE
113	Gravesham	70	Gravesham A2 AQMA	FALSE
118	Harborough	138	Lutterworth AQMA	FALSE
126	Herefordshire Council	22	Hereford AQMA	FALSE
143	Leeds City Council	73	AQMA 1 Ebor Gardens	Background Urban
143	Leeds City Council	513	AQMA 3 Crispin House, New York Road	Background Urban
143	Leeds City Council	514	AQMA 4 Caspar Apartments, 55 North Street	Background Urban
143	Leeds City Council	515	AQMA 5 Oatland Heights	Background Urban
143	Leeds City Council	516	AQMA 6 Marlborough Grange	Background Urban
143	Leeds City Council	517	AQMA 7 Dewsbury Road	Background Urban
144	Leicester City Council	35	Leicester AQMA	Background Urban
149	Liverpool City Council	211	Liverpool City Centre AQMA	FALSE
149	Liverpool City Council	212	Liverpool M62/Rocket Junction AQMA	FALSE
152	Maidstone	85	Maidstone AQMA	FALSE
152	Maidstone	317	Maidstone Town centre	FALSE
155	Manchester City Council	36	Manchester AQMA	Background Urban

LA ID	Local Authority	AQMA ID	AQMA Title	AQMAs with suitably located AURN sites, sufficient monitoring data and sufficient AQAP PRs
157	Medway Council	87	Chatham Centre AQMA	FALSE
157	Medway Council	233	Cuxton Road AQMA	FALSE
157	Medway Council	234	Frindsbury Hill AQMA	FALSE
157	Medway Council	235	Maidstone Road AQMA	FALSE
157	Medway Council	236	Rochester Centre AQMA	FALSE
157	Medway Council	237	Strood Centre AQMA:	FALSE
169	Newcastle City Council	238	Newcastle upon Tyne AQMA No.1	Background Urban
183	North Warwickshire	38	Stonebridge AQMA	FALSE
184	North West Leicestershire	41	AQMA 2: Kegworth A6	FALSE
184	North West Leicestershire	44	AQMA 1: Vicinity of M1 (South-bound)	FALSE
187	Norwich City Council	207	Norwich City Council AQMA No.1 (St Augustines)	FALSE
187	Norwich City Council	208	Norwich City Council AQMA No.2 (Grapes Hill)	FALSE
187	Norwich City Council	209	Norwich City Council AQMA No.3 (Castle AQMA)	FALSE
193	Oxford City Council	45	Oxford AQMA	Traffic
204	Reigate And Banstead	149	AQMA No.1	FALSE
204	Reigate And Banstead	150	AQMA No. 2	FALSE
204	Reigate And Banstead	228	AQMA No.3	FALSE
213	Rotherham	46	Rotherham AQMA 1 - Part1 (NO2)	FALSE
213	Rotherham	47	Rotherham AQMA 1 - Part 2 (NO2)	FALSE
213	Rotherham	218	Rotherham AQMA 1 - Part 3 (NO2)	FALSE
213	Rotherham	257	Fitzwilliam Road (NO2) AQMA	FALSE
213	Rotherham	258	Wellgate (NO2) AQMA	FALSE
213	Rotherham	259	Wortley Road (NO2) AQMA	FALSE
215	Runnymede	48	Area 1	FALSE
215	Runnymede	49	Area 2	FALSE
220	Salford City Council	134	Salford AQMA	Background Urban
221	Salisbury	104	Brown Street & Winchester Street, Salisbury (amended)	FALSE
221	Salisbury	105	Fisherton Street, Salisbury	FALSE

LA ID	Local Authority	AQMA ID	AQMA Title	AQMAs with suitably located AURN sites, sufficient monitoring data and sufficient AQAP PRs
221	Salisbury	106	Milford Street, Salisbury	FALSE
221	Salisbury	107	Minster Street, Salisbury	FALSE
221	Salisbury	217	King Street (Warminster Road) (A36), Wilton	FALSE
221	Salisbury	285	Exeter Street, Salisbury	FALSE
222	Sandwell	173	Great Barr SE	FALSE
222	Sandwell	169	Oldbury AQMA	Background Urban
222	Sandwell	170	Yew Tree AQMA	Background Urban
222	Sandwell	171	Great Barr NW	Background Urban
222	Sandwell	172	Great Barr South	Background Urban
222	Sandwell	174	Great Barr SW	Background Urban
228	Sevenoaks	144	No.1 (M20 AQMA)	FALSE
228	Sevenoaks	145	No.2 (M25 AQMA)	FALSE
228	Sevenoaks	146	No.3 (M26 AQMA)	FALSE
228	Sevenoaks	147	No.4 (A20(T) AQMA)	FALSE
228	Sevenoaks	148	No. 5 (Riverhead AQMA)	FALSE
229	Sheffield City Council	51	City Centre Air Action Zone	FALSE
229	Sheffield City Council	52	M1 Corridor Air Action Zone	FALSE
242	South Kesteven	123	No. 1 Wharf Road	FALSE
243	South Lakeland	128	Kendal AQMA	FALSE
249	South Somerset	168	Yeovil AQMA	FALSE
267	Surrey Heath	133	Surrey Heath AQMA	FALSE
270	Tameside	109	Tameside AQMAs	Background Urban
273	Taunton Deane	189	East Reach AQMA	FALSE
273	Taunton Deane	198	Henlade AQMA	FALSE
282	Thurrock	86	Thurrock AQMA	Background Urban
283	Tonbridge & Malling	61	Tonbridge and Malling AQMA	FALSE
286	Trafford	84	Trafford AQMA	Background Urban
292	Wakefield City	225	Wakefield M1 AQMA	FALSE
292	Wakefield City	226	Wakefield West Park Terrace AQMA	FALSE

LA ID	Local Authority	AQMA ID	AQMA Title	AQMAs with suitably located AURN sites, sufficient monitoring data and sufficient AQAP PRs
295	Warrington	64	Warrington AQMA	FALSE
311	West Wiltshire	62	Westbury AQMA	FALSE
311	West Wiltshire	63	Bradford-on-Avon AQMA	FALSE
314	Winchester City Council	220	Winchester Town Centre AQMA	FALSE
318	Wokingham	129	Wokingham AQMA	FALSE
323	Wycombe	65	Wycombe AQMA	FALSE
325	Wyre Forest	213	Horsefair AQMA	FALSE
325	Wyre Forest	214	Welch Gate AQMA	FALSE

**Appendix 7. Table 17: Details of local authority monitoring sites suitably sited in relation to AQMAs (from Progress Reports (2010-2013) and Updating and Screening Assessments (2009 & 2012))**

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
10	NA	USA 2012	Barnsley A635 Roadside	R	436298	405691	NO2	N	Chemiluminescence	N	NA	8	Y
10	NA	USA 2012	Barnsley A628 Roadside	R	432680	406174	NO2	Y	Chemiluminescence	N	30	3.5	Y
10	NA	USA 2012	Barnsley Gawber	UB	432525	407475	NO2 SO2 O3	N	Chemiluminescence	Y	NA	NA	N
36	NA	USA 2012	Brislington Depot	UB	361180	171559	NO2	Y	NA	Y	20	20	N
36	10	USA 2012	Rupert Street	UC	358651	173145	NO2	Y	NA	Y	NA	0	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
36	NA	USA 2012	Parson Street School	R	358065	170586	NO2	Y	NA	Y	5	4	N
36	NA	USA 2012	Wells Road	K	360904	170003	NO2	Y	NA	Y	3	1	N
36	10	USA 2012	Newfoundland Road Police Station	R	359644	173681	NO2	Y	NA	Y	10	8	N
36	10	USA 2012	Shiner's Garage	R	361022	173352	NO2	Y	NA	Y	10	6	N
36	NA	USA 2012	Bath Road	R	360382	171659	NO2	N	NA	Y	5	6	N
36	10	USA 2012	AURN St. Pauls	UB	359485	173912	NO2 CO SO2 O3 PM10	Y	NA	Y	10	4	N
36	NA	USA 2012	Fishponds Road	R	362927	175588	NO2	Y	NA	Y	3	3	N
52	15	USA 2012	Durham Rd (Loughborough)	UB	452352	320697	NO2 SO2 PM10	N	Chemiluminescence	N	NA	NA	N
52	15	USA 2012	Baxter Gate (Loughborough)	R	453687	319672	NO2	Y	Chemiluminescence	N	NA	1	N
52	NA	USA 2012	Melton Rd (Syston)	R	462540	311428	NO2	Y	Chemiluminescence	Y	10	3	N
64	NA	USA 2012	Brook Street	R	600572	225139	NO2	Y	NA	Y	0.5	3	N

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
229	NA	PR 2010	GH1 Firvale School	UB	436990	390218	NO2 PM10 SO2	Y	Chemiluminescence	Y	1	10	N
229	NA	PR 2010	Sheffield Centre DEFRA site	UC	435158	386885	NO2 PM10 PM2.5 SO2 O3 CO Benzene	Y	Chemiluminescence	Y	1	20	N
229	NA	PR 2010	GH3 Lowfield School	UC	435181	385366	NO2 PM10 SO2	Y	Chemiluminescence	Y	1	10	N
229	51	PR 2010	GH4 Wicker	UB	435959	388021	NO2 PM10 O3	Y	Chemiluminescence	Y	1	50	N
229	NA	PR 2010	GH5 King Ecgbert School	UB	430977	380760	NO2 PM10 O3	Y	Chemiluminescence	N	NA	100	N
229	51	PR 2010	RM1 Waingate	R	435750	387647	NO2 PM10	Y	Chemiluminescence	Y	1	3	N
26	54	PR 2011	M25 J13	R	502807	173572	CO NO2 SO2 PM10 PM2.5 O3	Y	NA	N	NA	6	Y
19	NA	PR 2010	Blaby 1	R	454482	298573	NO2 PM10	Y	NA	Y	1	2	Y
19	NA	PR 2010	Blaby 3	R	455966	301137	NO2	Y	NA	Y	1	1	Y
113	NA	PR 2011	Gravesham A2 Roadside Painters Ash	R	562589	172076	NO2 PM10	Y	NA	N	NA	42	N

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
152	NA	PR 2011	Maidstone A229 Roadside Bridge Gyrotory Maidstone	R	575740	155615	NO2 PM10	Y	Chemiluminescence	N	NA	2	Y
69	NA	PR 2010	Ball Hill	R	435129	279282	NO2	Y	NA	Y	2.5	3.5	N
80	90/502	PR 2010	Unit 3 Market Place	UC	457669	403611	NO2 PM10	Y	Chemiluminescence	Y	30.7	20	N
80	NA	PR 2010	Unit 4 A1/A630 Grosvenor Terrace	R	454964	400745	NO2	Y	Chemiluminescence	Y	15.7	7	N
80	502	PR 2010	Unit 6 A638 Bawtry Road	R	462278	400111	NO2	Y	Chemiluminescence	Y	20	2	N
157	NA	USA 2009	Chatham Roadside	R	577487	166947	PM10 NO2	N	NA	Y	0	4	N
157	NA	USA 2009	Chatham Luton Background	UB	577101	166646	CO PM10 NO2 O3 SO2	N	NA	Y	0	NA	N
169	238	PR 2010	Percy Street (Romon)	R	424776	564861	NO2	Y	NA	Y	NA	20	Y
169	238	PR 2010	Leazes Lane (Romon)	R	424525	564770	NO2	Y	NA	Y	NA	7	N
187	NA	PR 2011	Norwich Castle Meadow	R	623202	308615	O3 CO SO2 PM10 NOx NO2 PM2.5	Y	NA	N	NA	1	N
220	134	PR 2011	AQM1 M60 (Worsley)	K	374810	400856	PM10 SO2 NOx CO O3	Y	NA	Y	11	21	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
222	NA	PR 2011	Birmingham Road (Oldbury)	R	399857	289392	NO2 PM10	Y	Chemiluminescence	Y	8	5	Y
222	NA	PR 2011	Wilderness Lane (Great Barr)	R	403956	294855	NO2 PM10	Y	Chemiluminescence	Y	147	11	N
242	NA	PR 2010	Wharf Road	R	491387	335523	NO <sub>2</sub>	Y	NA	Y	0	5	N
243	NA	USA 2012	Lowther Street	R	351610	492650	NO NOX NO2	Y	Chemiluminescence	Y	0.5	0.5	N
318	129	PR 2011	Woodward Close	R	478658	170194	NO2 PM10	Y	NA	Y	15	6	N
318	129	PR 2011	Winnersh (Forest School)	UB	478026	170878	NO2 PM10	N	NA	Y	4	NA	N
267	NA	PR 2010	Castle Road Camberley	R	488634	159799	NO <sub>x</sub> NO2 PM10	Y	NA	N	25	17	Y
325	NA	USA 2009	Welch Gate	K	378462	275289	NO2	Y	NA	Y	1	3	Y
325	NA	USA 2009	Horsefair	K	383299	277056	NO2	Y	NA	Y	1	3	Y
24	137	PR 2011	Bolton University	UB	371000	408500	CO NO2 PM10 SO2 O3	N	NA	Y	25	170	N
27	9	PR 2011	Haven Bridge Road	R	532592	343699	NO2	Y	NA	Y	3	5	Y
63	NA	USA 2012	Bootham	UB	460022	452777	NO <sub>x</sub> PM10	N	Chemiluminescence	Y	0	49.59	N
63	NA	USA 2012	Fishergate	R	460746	451038	NO <sub>x</sub> PM10	Y	Chemiluminescence	Y	10	3.15	Y
63	NA	USA 2012	Holgate	R	459512	451282	NO <sub>x</sub> PM10	Y	Chemiluminescence	Y	12	2.5	Y



LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
63	NA	USA 2012	Nunnery Lane	R	460068	451199	NOx	Y	Chemiluminescence	Y	4	1.7	Y
63	NA	USA 2012	Gillygate	R	460147	452345	NOx	Y	Chemiluminescence	Y	3	2.1	Y
63	NA	USA 2012	Lawrence Street	R	461256	451340	NOx	Y	Chemiluminescence	Y	5	3.2	Y
63	NA	USA 2012	Heworth Green	R	461126	452602	NOx	N	Chemiluminescence	Y	3	1.2	Y
63	NA	USA 2012	Fulford Road	R	460937	449464	NOx	Y	Chemiluminescence	Y	19	5	Y
144	NA	USA 2012	Abbey Lane	R	458574	306885	NO2 PM10	Y	Chemiluminescence	Y	0	7	Y
144	NA	USA 2012	Glenhills Way	R	457083	300156	NO2 PM10	Y	Chemiluminescence	Y	14	3	N
144	NA	USA 2012	Imperial Avenue	R	457245	303040	NO2 PM10	Y	Chemiluminescence	Y	0	7.5	Y
144	NA	USA 2012	London Road	R	460843	302059	NO2 PM10	Y	Chemiluminescence	N	NA	NA	N
144	NA	USA 2012	Melton Road	R	459528	306316	NO2 PM10	Y	Chemiluminescence	Y	0	3	Y
144	NA	USA 2012	St Matthews Way	R	459221	305036	NO2	Y	Chemiluminescence	Y	10	2	N
144	NA	USA 2012	Uppingham Road	R	461188	305306	NO2	Y	Chemiluminescence	Y	10	2	N
144	NA	USA 2012	Vaughan Way	R	458507	304904	NO2 PM10	Y	Chemiluminescence	Y	0	NA	Y
149	NA	PR 2010	Islington	R	335393	390951	NO2 NOx O3 PM10	Y	Chemiluminescence	N	0	2	Y
149	NA	PR 2010	Old Haymarket	R	334762	390686	NO2 NOx	Y	Chemiluminescence	Y	20	1	Y
193	NA	USA 2012	High Street	UC	451677	206272	NO2 PM10	Y	NA	Y	1	2	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
213	NA	PR 2010	Bradgate (A629)	R	441006	393338	NO2 PM10	Y	NA	Y	0	3	N
213	NA	PR 2010	St Ann's	R	443300	393350	NO2 PM10	Y	NA	Y	0	2	N
213	NA	PR 2010	Wales (village)	R	447368	382900	NO2 PM10	Y	NA	N	28	2.5	Y
213	NA	PR 2010	Rotherham centre	UB	442994	392972	NO2 SO2 O3	N	NA	Y	NA	NA	N
221	NA	USA 2012	Exeter Street Salisbury	R	414547	129575	NOx PM10	Y	Chemiluminescence	Y	NA	2.5	Y
221	NA	USA 2012	Bridge Street Salisbury	R	414295	129944	NOx PM10	Y	Chemiluminescence	Y	NA	2.5	Y
249	NA	PR 2010	Yeovil	TC	355405	116379	NO2 PM10	Y	Chemiluminescence	Y	NA	3	N
270	NA	USA 2009	Two Trees	UB	393440	394330	NOx PM10 SO2 CO O3	N	NA	Y	1	NA	N
270	NA	USA 2009	Lumb Lane	M	391449	397321	NOx PM10	Y	NA	Y	8	1	N
270	NA	USA 2009	Mottram	K	399781	395817	NOx PM10	Y	NA	Y	1	1	Y
270	NA	USA 2009	Hyde	UC	394756	394853	NOx PM10	Y	NA	Y	60	1	Y
286	NA	USA 2009	Moss Park	UB	378787	394725	NO2 NOx PM10 and SO2	N	NA	Y	65	100	N
286	NA	USA 2009	A56	R	379422	394024	NO2 NOx and PM10	Y	NA	Y	42	5	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
292	NA	PR 2010	Castleford*	R	443360	425275	NO2 PM10	Y	NA	Y	5	5	N
292	NA	PR 2010	South Kirkby	UB	445571	411090	NO2 PM10 SO2 Smoke	N	NA	Y	1	18	Y
292	NA	PR 2010	Park Street	UB	433718	420371	NO2 PM10 SO2 CO	Y	NA	Y	10	27	Y
292	NA	PR 2010	Newton Bar	R	432735	421838	NO2 PM10	Y	NA	Y	5	10	N
292	NA	PR 2010	Horbury Road	K	430607	418936	NO2 PM10	Y	NA	Y	5	1	Y
311	NA	USA 2012	Oval Motors Warminster Rd Westbury	R	387154	150901	NOx	Y	Chemiluminescence	Y	1	3	Y
311	NA	USA 2012	St Margaret's Street Bradford On Avon	R	382528	160798	NOx	Y	Chemiluminescence	Y	0.5	2	N
314	NA	PR 2011	Echo Offices	R	448215	129510	PM10 NO2	Y	NA	N	NA	2.75	Y
314	NA	PR 2011	Godson House	UB	448509	129539	PM10 NO2	Y	NA	N	NA	NA	N
18	NA	USA 2012	Birmingham Fore St	R	407060	286869	NOX	Y	NA	Y	1	6	Y
18	NA	USA 2012	Birmingham Stratford Rd	R	408820	284591	NOX PM10	Y	NA	Y	1	5	Y
18	NA	USA 2012	Birmingham Selly Oak	R	404545	283020	NOX PM10	Y	NA	Y	21	7	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
18	NA	USA 2012	Birmingham New Hall	UB	414574	296724	NOX PM10	Y	NA	Y	41	20	N
18	NA	USA 2012	Birmingham Acocks Green	UB	411649	282207	NOX O3 FDMS PM2.5 SO2	Y	NA	Y	49	68	N
38	NA	USA 2012	Lickey End	R	397010	273112	NO2	Y	Chemiluminescence	Y	15	3.2	Y
23	NA	PR 2011	South Normanton	UB	444180	356353	PM10 NO2	N	Chemiluminescence	Y	NA	NA	N
69	NA	PR 2010	Queensland Avenue	R	431572	279022	PM10 NO2	Y	NA	Y	9	3.5	N
69	NA	PR 2010	Foleshill Road	R	434251	281512	PM10 NO2	Y	NA	Y	9	6	N
69	NA	PR 2010	Tollbar End	R	436530	275696	PM10 NO2	Y	NA	Y	25	4.5	N
75	NA	PR 2011	Dartford Town Centre	R	554117	173852	NO2 PM10	Y	NA	N	NA	2.7	Y
75	NA	PR 2011	Bean Interchange	R	558622	172752	NO2 PM10	Y	NA	Y	16.6	7	Y
75	NA	PR 2011	St Clements	R	558525	174709	NO2 PM10	Y	NA	Y	20	2.9	Y
82	NA	USA 2012	Central Dudley	UB	394291	290460	NO2	Y	Chemiluminescence	N	NA	NA	NA
82	NA	USA 2012	Colley Gate	R	394243	284626	NO2	Y	Chemiluminescence	Y	21	4	N
82	NA	USA 2012	Burnt Tree	R	395761	290575	NO2	Y	Chemiluminescence	Y	9	9	N
82	NA	USA 2012	Wordplay	R	389134	286893	NO2	Y	Chemiluminescence	Y	7	4	N
143	NA	PR 2011	Corn Exchange	K	430358	433422	NO2 PM10	N	NA	N	NA	1	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
143	NA	PR 2011	Headingley	K	427989	436045	NO2 PM10	N	NA	Y	NA	1	Y
143	NA	PR 2011	West Street	UC	429011	433617	NO2	N	NA	N	NA	NA	N
143	NA	PR 2011	Haslewood Close	R	431274	433711	NO2	Y	NA	Y	1	10	Y
143	NA	PR 2011	Queen Street Morley	R	426332	427870	NO2	N	NA	N	1	5	Y
143	NA	PR 2011	Millshaw	SB	427894	430040	NO2 PM10	N	NA	N	NA	NA	N
143	NA	PR 2011	Jack Lane Hunslet	R	430731	431911	NO2 PM10	N	NA	Y	NA	5	Y
143	NA	PR 2011	Norman Row	R	426277	435816	NO2	N	NA	Y	1	2	Y
143	NA	PR 2011	Victoria Avenue	R	432419	433674	NO2	N	NA	Y	NA	15	N
143	NA	PR 2011	Woodhouse Hill Road	R	431407	430597	NO2 PM10	N	NA	Y	NA	30	N
155	NA	USA 2012	Piccadilly Gardens	UC	384310	398337	NOX PM10 PM2.5 O3 CO SO2 Benzene	Y	Chemiluminescence	N	NA	56	NA
155	NA	USA 2012	Manchester South	SB	383904	385818	NOX O3 SO2	N	Chemiluminescence	N	102	64	NA
155	NA	USA 2012	Manchester Oxford Road	K	384233	397287	NOX PM10	Y	Chemiluminescence	Y	1	0.5	Y
169	NA	PR 2013	Jesmond Road Cradlewell (G'hog)	R	425992	565831	NO2 PM10 O3	Y	NA	Y	6	3	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
169	NA	PR 2013	High Street Gosforth (G'hog)	R	424411	568115	NO2 PM10	Y	NA	Y	37	3	Y
169	NA	PR 2013	Forster Street Quayside (Romon)	R	425541	564078	NO2	Y	NA	Y	6	3	N
169	NA	PR 2013	Swan House Pilgrim Street (Romon)	R	425124	564112	NO2	Y	NA	Y	10	2	Y
183	NA	PR 2010	Monitoring Station	M	419890	287100	NO2	N	Chemiluminescence	N	245	57	Y
184	NA	PR 2011	Coalville	R	443660	314002	NO NO2 NOx	Y	Chemiluminescence	Y	5.8	2	Y
184	NA	PR 2011	Castle Donington	R	444534	327365	NO NO2 NOx	Y	Chemiluminescence	Y	0	1.5	Y
187	NA	USA 2012	Norwich Lakenfields	UB	623637	306940	PM10 PM2.5 NOx NO2 Ozone SO2	N	Chemiluminescence	Y	20	NA	N
204	NA	PR 2011	RG 1 - Michael Crescent Horley	SB	528208	142337	NOx PM10 O3	Y	NA	Y	NA	19	N
204	NA	PR 2011	RG 2 - 74 The Crescent Horley	SB	528554	141855	NOx	Y	NA	Y	NA	3	N
204	NA	PR 2011	RG 4 – Reigate High Street	K	525335	150250	NOx	Y	NA	Y	NA	1	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
213	NA	PR 2010	Blackburn	M	438696	392816	NO2 PM2.5	N	NA	Y	0	46	N
213	NA	PR 2010	Howarth	M	442993	389129	NO2 PM10	Y	NA	Y	0	73	N
222	NA	PR 2011	Haden Hill (Cradley Heath)	UB	395755	285493	NO2 PM10 PM2.5	Y	Chemiluminescence	Y	105	119	N
273	NA	USA 2012	Deane House Taunton	UB	322505	125211	NO2 O3	N	Chemiluminescence	N	NA	45	N
283	NA	USA 2012	Tonbridge Roadside 2 (ZT5)	R	558876	146185	NO2	Y	Chemiluminescence	Y	1	2.2	Y
295	NA	USA 2012	Selby Street	UB	359151	388218	NO2 SO2 PM2.5 PM10	N	Chemiluminescence	N	NA	50	NA
295	NA	USA 2012	Parker Street	R	360015	387907	NO2	Y	Chemiluminescence	Y	NA	2	Y
295	NA	USA 2012	Chester Road	R	360331	386454	NO2	Y	Chemiluminescence	Y	NA	2	Y
323	NA	PR 2013	Stokenchurch	SB	476604	195436	NO2	Y	Chemiluminescence	Y	NA	14	Y
323	NA	PR 2013	Wycombe Abbey	R	486326	192425	NO2	NA	Chemiluminescence	Y	NA	7.5	Y
323	NA	PR 2013	Wycombe Hughenden	R	486481	193804	NO2	NA	Chemiluminescence	Y	NA	2	Y
325	NA	PR 2011	Stourport - on - Severn	R	380995	271302	NO2	N	Chemiluminescence	Y	1	NA	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
18	NA	USA 2012	Birmingham Tyburn Roadside	R	411577	290491	NOX O3 FDMS PM10 & 2.5	Y	NA	Y	10	6	Y
18	NA	USA 2012	Birmingham Tyburn	UB	411592	290440	NOX O3 FDMS PM10 & 2.5 SO2	Y	NA	Y	27	65	N
18	NA	PR 2010	Birmingham Hodge Hill	UB	412660	289910	NOX PM10 & 2.5	Y	NA	Y	7	72	Y
18	NA	USA 2009	Birmingham Centre	UC	406300	286800	NOX O3 FDMS PM10 & 2.5	Y	NA	Y	20	55	N
10	NA	USA 2009	Barnsley Old Mill Lane	R	434106	407327	NO2 SO2 PM10	N	NA	Y	NA	NA	Y
19	NA	USA 2009	Blaby 2	R	448416	291967	NO2 PM10	N	NA	Y	1	2	Y
26	NA	USA 2012	Sunbury Cross	UB	510064	170199	NO2 PM10 PM2.5 PM1	Y	NA	Y	18	30	N
26	NA	USA 2012	Heathrow Oaks Road	UB	505729	174496	NO2 PM10 PM2.5	Y	NA	N	NA	1	Y
36	NA	PR 2013	Old Market	R	359555	173166	NO2 PM10	Y	Chemiluminescence BAM	N	96	4	N
36	NA	PR 2011	Cheltenham Road	R	358950	174616	NO2 NO NOx	Y	NA	Y	10	7	N



LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
36	NA	PR 2010	Trailer Portway P&R	R	352275	177008	NO2 NO NOx	N	NA	N	NA	51	N
38	NA	PR 2011	Kidderminster Road Hagley	R	391354	280919	NO2	Y	NA	Y	NA	2.5	N
38	NA	PR 2010	Worcester Road Bromsgrove	F	395702	270423	NO2	N	NA	Y	NA	3.7	Y
38	NA	USA 2009	Bromsgrove Redditch Road	R	395189	268563	NO2	N	NA	Y	1.3	1.8	Y
63	NA	PR 2010	St Sampsons	R	460323	451886	NOx	N	NA	Y	0	5	N
64	NA	PR 2010	Mersea Road	R	599923	224738	NO2	Y	NA	Y	1	2.7	N
64	NA	USA 2009	Lucy Lane South	INT	595094	225099	NO2 PM10	N	NA	Y	23	5	N
80	NA	PR 2010	Unit 1 A18 Carr House Road	R	458027	402475	NO2 PM10	Y	Chemiluminescence	Y	NA	17	N
80	NA	PR 2010	Unit 2 A18/A630 Clay Lane	R	460904	405889	NO2 PM10	N	Chemiluminescence	N	25	5	Y
80	NA	PR 2010	Unit 5 A19/A638 St Mary's Gyatory	R	456773	404056	NO2 PM10 SO2 CO	N	Chemiluminescence	Y	16	11.7	Y
80	NA	PR 2010	Unit 9 A630 Balby Library	R	456333	401412	NO2	Y	Chemiluminescence	Y	21	7.8	N
82	NA	PR 2010	Brierley Hill Rose	R	391861	287296	NO2	Y	Chemiluminescence	Y	28	3.5	N

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
101	NA	PR 2010	Langdale Drive	M	447192	332847	NO2	N	Chemiluminescence	Y	6	87	N
118	NA	PR 2010	Lutterworth	R	454473	284544	NO2 NO NOx PM10	Y	Chemiluminescence	Y	10	3	Y
126	NA	PR 2011	Edgar Street	CC	350776	240224	NO2 PM10	Y	NA	N	NA	0.5	Y
143	NA	PR 2011	Leeds Centre (AURN)	UC	429969	434259	NO2 PM10 CO O3SO2	N	NA	N	NA	NA	N
143	NA	PR 2010	Middlecross Armley	UB	427733	433249	NO2 PM10	N	NA	Y	NA	NA	N
143	NA	USA 2009	Compton Road	R	432387	434886	NO2	N	NA	N	3	Y	NA
144	NA	USA 2012	AURN (New Walk Centre)	UB	458763	304065	NO NO2 CO2 O3 SO2	Y	NA	N	NA	NA	N
144	NA	USA 2009	Bassett Street	R	457788	305444	NA	NA	NA	NA	NA	NA	NA
149	NA	PR 2010	Speke	UB	343884	383601	1 3 Butadiene NO2 NOx SO2 O3 PM 2.5 PM10 Benzene PAH Lead CO	Y	NA	N	20	3	N
149	NA	PR 2010	Queens Drive	R	336164	394906	NO2 NOx PM10	Y	Chemiluminescence	Y	10	3	Y

LA ID	AQMA ID	Report	Site Name	Site Type	X	Y	Pollutants	In AQMA	Monitoring Technique	Relevant Exposure	Distance to relevant exposure	Distance to kerb of nearest road	Worst-case exposure
169	NA	PR 2010	St. Mary's Place (AURN)	UC	425029	564916	CO NO NOX NO2 PM10 PM2.5 O3 SO2	Y	NA	N	30	20	N
169	NA	USA 2009	Scotswood Road	R	423464	563265	NO2	Y	NA	Y	6	7	N
193	NA	USA 2012	St Aldate's AUN	UC	451359	206152	NO2	Y	NA	Y	1	3	Y
193	NA	USA 2012	St Ebbe's AUN	UB	451164	205386	NO2 PM2.5 PM10 Ozone	Y	NA	Y	10	5	N
193	NA	USA 2012	Lydia Close	R	455596	207502	NO2	Y	NA	Y	1	15	N
220	NA	PR 2011	AQM 3 Glazebury	UB	368998	395901	NOX O3	N	NA	N	0	NA	NA
222	NA	PR 2011	West Bromwich	UB	400399	291416	NO2 SO2 PM10 O3	Y	Chemiluminescence	Y	109	27	N
273	NA	PR 2011	Mantle Street Wellington	R	313798	120519	NO2 PM10	N	Chemiluminescence	Y	10	2	N
295	NA	PR 2010	Brian Beven Island	R	360700	387487	NO2	N	Chemiluminescence	Y	NA	16	Y
323	NA	USA 2009	West Wycombe	SB	483040	194641	NO2	N	NA	N	NA	267	N
18	NA	USA 2009	Birmingham Bristol St	R	406855	285499	NOX, PM10	Y	NA	Y	21	7	Y

**Appendix 7. Table 18: AQMAs and representative local authority monitoring sites**

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
10	Barnsley A628 Roadside	R	6	Barnsley	Barnsley AQMA
10	Barnsley Gawber	UB	6	Barnsley	Barnsley AQMA
18	Birmingham Fore St	R	187	Birmingham	Birmingham AQMA
18	Birmingham Stratford Rd	R	187	Birmingham	Birmingham AQMA
18	Birmingham Selly Oak	R	187	Birmingham	Birmingham AQMA
18	Birmingham Tyburn Roadside	R	187	Birmingham	Birmingham AQMA
18	Birmingham Bristol St	R	187	Birmingham	Birmingham AQMA
18	Birmingham New Hall	UB	187	Birmingham	Birmingham AQMA
18	Birmingham Acocks Green	UB	187	Birmingham	Birmingham AQMA
18	Birmingham Tyburn	UB	187	Birmingham	Birmingham AQMA
18	Birmingham Hodge Hill	UB	187	Birmingham	Birmingham AQMA
18	Birmingham Centre	UC	187	Birmingham	Birmingham AQMA
19	Blaby 3	R	66	Blaby	AQMA1
19	Blaby 1	R	67	Blaby	AQMA2
23	South Normanton	UB	8	Bolsover	South Normanton AQMA
24	Bolton University	UB	134	Salford City Council	Salford AQMA
24	Bolton University	UB	137	Bolton	Bolton AQMA
24	Bolton University	UB	154	Bury	Bury AQMA
26	Heathrow Oaks Road	UB	48	Runnymede	Area 1
26	M25 J13	R	54	Spelthorne	Spelthorne AQMA
26	Sunbury Cross	UB	54	Spelthorne	Spelthorne AQMA
26	Heathrow Oaks Road	UB	54	Spelthorne	Spelthorne AQMA
26	Heathrow Oaks Road	UB	247	South Bucks	South Bucks AQMA
27	Haven Bridge Road	R	9	Boston	Boston AQMA
36	Parson Street School	R	10	Bristol City Council	Bristol AQMA
36	Wells Road	K	10	Bristol City Council	Bristol AQMA
36	Newfoundland Road Police Station	R	10	Bristol City Council	Bristol AQMA
36	Shiner's Garage	R	10	Bristol City Council	Bristol AQMA
36	Bath Road	R	10	Bristol City Council	Bristol AQMA
36	Old Market	R	10	Bristol City Council	Bristol AQMA

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
36	Cheltenham Road	R	10	Bristol City Council	Bristol AQMA
36	Trailer Portway P&R	R	10	Bristol City Council	Bristol AQMA
36	Brislington Depot	UB	10	Bristol City Council	Bristol AQMA
36	Rupert Street	UC	10	Bristol City Council	Bristol AQMA
36	AURN St. Pauls	UB	10	Bristol City Council	Bristol AQMA
38	Lickey End	R	114	Bromsgrove	Lickey End AQMA
52	Baxter Gate (Loughborough)	R	15	Charnwood	Loughborough AQMA
52	Durham Rd (Loughborough)	UB	15	Charnwood	Loughborough AQMA
52	Melton Rd (Syston)	R	17	Charnwood	Syston AQMA
52	Durham Rd (Loughborough)	UB	44	North West Leicestershire	AQMA 1: Vicinity of M1 (South-bound)
63	Fishergate	R	88	City Of York	York AQMA
63	Holgate	R	88	City Of York	York AQMA
63	Nunnery Lane	R	88	City Of York	York AQMA
63	Gillygate	R	88	City Of York	York AQMA
63	Lawrence Street	R	88	City Of York	York AQMA
63	Heworth Green	R	88	City Of York	York AQMA
63	St Sampsons	R	88	City Of York	York AQMA
63	Bootham	UB	88	City Of York	York AQMA
64	Mersea Road	R	18	Colchester	Colchester AQMA
69	Ball Hill	R	216	Coventry City Council	AQMA No.2
80	Unit 3 Market Place	UC	89	Doncaster	Market Place Area
80	Unit 4 A1/A630 Grosvenor Terrace	R	90	Doncaster	A1(M)/Warmsworth Road Junction, Balby Road Area
80	Unit 9 A630 Balby Library	R	90	Doncaster	A1(M)/Warmsworth Road Junction, Balby Road Area
80	Unit 3 Market Place	UC	90	Doncaster	A1(M)/Warmsworth Road Junction, Balby Road Area
80	Unit 1 A18 Carr House Road	R	91	Doncaster	Carr House Road Area
80	Unit 3 Market Place	UC	91	Doncaster	Carr House Road Area
80	Unit 6 A638 Bawtry Road	R	502	Doncaster	M18/A638 Hatchell Wood Cantley.
82	Brierley Hill Rose	R	190	Dudley	Brierley Hill AQMA
82	Central Dudley	UB	190	Dudley	Brierley Hill AQMA

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
113	Gravesham A2 Roadside Painters Ash	R	70	Gravesham	Gravesham A2 AQMA
118	Lutterworth	R	138	Harborough	Lutterworth AQMA
126	Edgar Street	CC	22	Herefordshire Council	Hereford AQMA
143	Haslewood Close	R	73	Leeds City Council	AQMA 1 Ebor Gardens
143	West Street	UC	73	Leeds City Council	AQMA 1 Ebor Gardens
143	Millshaw	SB	73	Leeds City Council	AQMA 1 Ebor Gardens
143	Leeds Centre (AURN)	UC	73	Leeds City Council	AQMA 1 Ebor Gardens
143	Middlecross Armley	UB	73	Leeds City Council	AQMA 1 Ebor Gardens
143	West Street	UC	513	Leeds City Council	AQMA 3 Crispin House, New York Road
143	Millshaw	SB	513	Leeds City Council	AQMA 3 Crispin House, New York Road
143	Leeds Centre (AURN)	UC	513	Leeds City Council	AQMA 3 Crispin House, New York Road
143	Middlecross Armley	UB	513	Leeds City Council	AQMA 3 Crispin House, New York Road
143	West Street	UC	514	Leeds City Council	AQMA 4 Caspar Apartments, 55 North Street
143	Millshaw	SB	514	Leeds City Council	AQMA 4 Caspar Apartments, 55 North Street
143	Leeds Centre (AURN)	UC	514	Leeds City Council	AQMA 4 Caspar Apartments, 55 North Street
143	Middlecross Armley	UB	514	Leeds City Council	AQMA 4 Caspar Apartments, 55 North Street
143	West Street	UC	515	Leeds City Council	AQMA 5 Oatland Heights
143	Leeds Centre (AURN)	UC	515	Leeds City Council	AQMA 5 Oatland Heights
143	Middlecross Armley	UB	515	Leeds City Council	AQMA 5 Oatland Heights
143	West Street	UC	516	Leeds City Council	AQMA 6 Marlborough Grange
143	Millshaw	SB	516	Leeds City Council	AQMA 6 Marlborough Grange
143	Leeds Centre (AURN)	UC	516	Leeds City Council	AQMA 6 Marlborough Grange
143	Middlecross Armley	UB	516	Leeds City Council	AQMA 6 Marlborough Grange
143	Jack Lane Hunslet	R	517	Leeds City Council	AQMA 7 Dewsbury Road
143	West Street	UC	517	Leeds City Council	AQMA 7 Dewsbury Road
143	Millshaw	SB	517	Leeds City Council	AQMA 7 Dewsbury Road
143	Leeds Centre (AURN)	UC	517	Leeds City Council	AQMA 7 Dewsbury Road
143	Middlecross Armley	UB	517	Leeds City Council	AQMA 7 Dewsbury Road
144	Abbey Lane	R	35	Leicester City Council	Leicester AQMA
144	Glenhills Way	R	35	Leicester City Council	Leicester AQMA
144	Imperial Avenue	R	35	Leicester City Council	Leicester AQMA
144	London Road	R	35	Leicester City Council	Leicester AQMA

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
144	Melton Road	R	35	Leicester City Council	Leicester AQMA
144	St Matthews Way	R	35	Leicester City Council	Leicester AQMA
144	Uppingham Road	R	35	Leicester City Council	Leicester AQMA
144	Vaughan Way	R	35	Leicester City Council	Leicester AQMA
144	Bassett Street	R	35	Leicester City Council	Leicester AQMA
144	AURN (New Walk Centre)	UB	35	Leicester City Council	Leicester AQMA
144	AURN (New Walk Centre)	UB	66	Blaby	AQMA1
144	AURN (New Walk Centre)	UB	68	Blaby	AQMA3
144	AURN (New Walk Centre)	UB	161	Oadby & Wigston	Area 1
144	AURN (New Walk Centre)	UB	162	Oadby & Wigston	Area 2
144	AURN (New Walk Centre)	UB	163	Oadby & Wigston	Area 3
144	AURN (New Walk Centre)	UB	164	Oadby & Wigston	Area 4
149	Islington	R	211	Liverpool City Council	Liverpool City Centre AQMA
149	Old Haymarket	R	211	Liverpool City Council	Liverpool City Centre AQMA
152	Maidstone A229 Roadside Bridge Gyrotory Maidstone	R	317	Maidstone	Maidstone Town centre
155	Manchester Oxford Road	K	36	Manchester City Council	Manchester AQMA
155	Piccadilly Gardens	UC	36	Manchester City Council	Manchester AQMA
155	Manchester South	SB	36	Manchester City Council	Manchester AQMA
155	Manchester South	SB	81	Stockport	Stockport AQMA
155	Piccadilly Gardens	UC	84	Trafford	Trafford AQMA
155	Manchester South	SB	84	Trafford	Trafford AQMA
155	Piccadilly Gardens	UC	103	Oldham	Oldham AQMA
155	Piccadilly Gardens	UC	109	Tameside	Tameside AQMA
155	Piccadilly Gardens	UC	134	Salford City Council	Salford AQMA
155	Piccadilly Gardens	UC	154	Bury	Bury AQMA
157	Chatham Luton Background	UB	87	Medway Council	Chatham Centre AQMA
157	Chatham Luton Background	UB	233	Medway Council	Cuxton Road AQMA
157	Chatham Luton Background	UB	234	Medway Council	Frindsbury Hill AQMA
157	Chatham Luton Background	UB	235	Medway Council	Maidstone Road AQMA
157	Chatham Luton Background	UB	236	Medway Council	Rochester Centre AQMA
157	Chatham Luton Background	UB	237	Medway Council	Strood Centre AQMA:

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
169	Percy Street (Romon)	R	238	Newcastle City Council	Newcastle upon Tyne AQMA No.1
169	Leazes Lane (Romon)	R	238	Newcastle City Council	Newcastle upon Tyne AQMA No.1
169	Forster Street Quayside (Romon)	R	238	Newcastle City Council	Newcastle upon Tyne AQMA No.1
169	Swan House Pilgrim Street (Romon)	R	238	Newcastle City Council	Newcastle upon Tyne AQMA No.1
169	St. Mary's Place (AURN)	UC	238	Newcastle City Council	Newcastle upon Tyne AQMA No.1
183	Monitoring Station	M	38	North Warwickshire	Stonebridge AQMA
187	Norwich Lakenfields	UB	207	Norwich City Council	Norwich City Council AQMA No.1 (St Augustines)
187	Norwich Lakenfields	UB	208	Norwich City Council	Norwich City Council AQMA No.2 (Grapes Hill)
187	Norwich Castle Meadow	R	209	Norwich City Council	Norwich City Council AQMA No.3 (Castle AQMA)
187	Norwich Lakenfields	UB	209	Norwich City Council	Norwich City Council AQMA No.3 (Castle AQMA)
193	High Street	UC	45	Oxford City Council	Oxford AQMA
193	St Aldate's AUN	UC	45	Oxford City Council	Oxford AQMA
193	St Ebbe's AUN	UB	45	Oxford City Council	Oxford AQMA
204	RG 1 - Michael Crescent Horley	SB	150	Reigate And Banstead	AQMA No. 2
204	RG 2 - 74 The Crescent Horley	SB	150	Reigate And Banstead	AQMA No. 2
204	RG 1 - Michael Crescent Horley	SB	228	Reigate And Banstead	AQMA No.3
204	RG 2 - 74 The Crescent Horley	SB	228	Reigate And Banstead	AQMA No.3
213	Howarth	M	46	Rotherham	Rotherham AQMA 1 - Part1 (NO2)
213	Rotherham centre	UB	46	Rotherham	Rotherham AQMA 1 - Part1 (NO2)
213	Blackburn	M	47	Rotherham	Rotherham AQMA 1 - Part 2 (NO2)
213	Rotherham centre	UB	47	Rotherham	Rotherham AQMA 1 - Part 2 (NO2)
213	Blackburn	M	52	Sheffield City Council	M1 Corridor Air Action Zone
213	Rotherham centre	UB	52	Sheffield City Council	M1 Corridor Air Action Zone
213	Wales (village)	R	218	Rotherham	Rotherham AQMA 1 - Part 3 (NO2)
213	St Ann's	R	257	Rotherham	Fitzwilliam Road (NO2) AQMA
213	Rotherham centre	UB	257	Rotherham	Fitzwilliam Road (NO2) AQMA
213	Rotherham centre	UB	258	Rotherham	Wellgate (NO2) AQMA
213	Bradgate (A629)	R	259	Rotherham	Wortley Road (NO2) AQMA



LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
213	Rotherham centre	UB	259	Rotherham	Wortley Road (NO2) AQMA
220	AQM 3 Glazebury	UB	64	Warrington	Warrington AQMA
220	AQM 3 Glazebury	UB	110	Wigan Council	Wigan AQMAs
220	AQM1 M60 (Worsley)	K	134	Salford City Council	Salford AQMA
220	AQM 3 Glazebury	UB	134	Salford City Council	Salford AQMA
221	Exeter Street Salisbury	R	104	Salisbury	Brown Street & Winchester Street, Salisbury (amended)
221	Bridge Street Salisbury	R	104	Salisbury	Brown Street & Winchester Street, Salisbury (amended)
221	Bridge Street Salisbury	R	105	Salisbury	Fisherton Street, Salisbury
221	Exeter Street Salisbury	R	106	Salisbury	Milford Street, Salisbury
221	Bridge Street Salisbury	R	106	Salisbury	Milford Street, Salisbury
221	Exeter Street Salisbury	R	107	Salisbury	Minster Street, Salisbury
221	Bridge Street Salisbury	R	107	Salisbury	Minster Street, Salisbury
221	Exeter Street Salisbury	R	285	Salisbury	Exeter Street, Salisbury
221	Bridge Street Salisbury	R	285	Salisbury	Exeter Street, Salisbury
222	Birmingham Road (Oldbury)	R	169	Sandwell	Oldbury AQMA
222	West Bromwich	UB	169	Sandwell	Oldbury AQMA
222	West Bromwich	UB	170	Sandwell	Yew Tree AQMA
222	Wilderness Lane (Great Barr)	R	171	Sandwell	Great Barr NW
222	West Bromwich	UB	171	Sandwell	Great Barr NW
222	Wilderness Lane (Great Barr)	R	172	Sandwell	Great Barr South
222	West Bromwich	UB	172	Sandwell	Great Barr South
222	Wilderness Lane (Great Barr)	R	174	Sandwell	Great Barr SW
222	West Bromwich	UB	174	Sandwell	Great Barr SW
222	Haden Hill (Cradley Heath)	UB	187	Birmingham	Birmingham AQMA
222	West Bromwich	UB	187	Birmingham	Birmingham AQMA
222	Haden Hill (Cradley Heath)	UB	190	Dudley	Brierley Hill AQMA
222	West Bromwich	UB	201	Walsall	AQMA No.3
229	GH1 Firvale School	UB	46	Rotherham	Rotherham AQMA 1 - Part1 (NO2)
229	GH1 Firvale School	UB	47	Rotherham	Rotherham AQMA 1 - Part 2 (NO2)
229	RM1 Waingate	R	51	Sheffield City Council	City Centre Air Action Zone

LA ID	Site Name	Site Type	AQMA ID	LOCAL AUTHORITY	AQMA TITLE
229	GH1 Firvale School	UB	51	Sheffield City Council	City Centre Air Action Zone
229	Sheffield Centre DEFRA site	UC	51	Sheffield City Council	City Centre Air Action Zone
229	GH3 Lowfield School	UC	51	Sheffield City Council	City Centre Air Action Zone
229	GH4 Wicker	UB	51	Sheffield City Council	City Centre Air Action Zone
229	GH1 Firvale School	UB	52	Sheffield City Council	M1 Corridor Air Action Zone
229	Sheffield Centre DEFRA site	UC	52	Sheffield City Council	M1 Corridor Air Action Zone
229	GH4 Wicker	UB	52	Sheffield City Council	M1 Corridor Air Action Zone
229	GH1 Firvale School	UB	259	Rotherham	Wortley Road (NO2) AQMA
242	Wharf Road	R	123	South Kesteven	No. 1 Wharf Road
243	Lowther Street	R	128	South Lakeland	Kendal AQMA
249	Yeovil	TC	168	South Somerset	Yeovil AQMA
267	Castle Road Camberley	R	133	Surrey Heath	Surrey Heath AQMA
270	Two Trees	UB	36	Manchester City Council	Manchester AQMA
270	Hyde	UC	36	Manchester City Council	Manchester AQMA
270	Two Trees	UB	81	Stockport	Stockport AQMA
270	Hyde	UC	81	Stockport	Stockport AQMA
270	Lumb Lane	M	109	Tameside	Tameside AQMAS
270	Two Trees	UB	109	Tameside	Tameside AQMAS
270	Hyde	UC	109	Tameside	Tameside AQMAS
273	Deane House Taunton	UB	189	Taunton Deane	East Reach AQMA
273	Deane House Taunton	UB	198	Taunton Deane	Henlade AQMA
286	Moss Park	UB	36	Manchester City Council	Manchester AQMA
286	A56	R	84	Trafford	Trafford AQMA
286	Moss Park	UB	84	Trafford	Trafford AQMA
286	Moss Park	UB	134	Salford City Council	Salford AQMA
292	Horbury Road	K	225	Wakefield City	Wakefield M1 AQMA
292	Park Street	UB	225	Wakefield City	Wakefield M1 AQMA
295	Selby Street	UB	64	Warrington	Warrington AQMA
311	Oval Motors Warminster Rd Westbury	R	62	West Wiltshire	Westbury AQMA
311	St Margaret's Street Bradford On Avon	R	63	West Wiltshire	Bradford-on-Avon AQMA
314	Echo Offices	R	220	Winchester City Council	Winchester Town Centre AQMA
314	Godson House	UB	220	Winchester City Council	Winchester Town Centre AQMA

<b>LA ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>AQMA ID</b>	<b>LOCAL AUTHORITY</b>	<b>AQMA TITLE</b>
318	Woodward Close	R	129	Wokingham	Wokingham AQMA
318	Winnersh (Forest School)	UB	129	Wokingham	Wokingham AQMA
323	Stokenchurch	SB	65	Wycombe	Wycombe AQMA
323	West Wycombe	SB	65	Wycombe	Wycombe AQMA
325	Horsefair	K	213	Wyre Forest	Horsefair AQMA
325	Welch Gate	K	214	Wyre Forest	Welch Gate AQMA

**Appendix 7. Table 19: AQMAs with both Traffic Urban and Background Urban monitoring sites (including AURN and local authority monitors)**

LA ID	Local Authority	AQMA ID	AQMA Title
10	Barnsley	6	Barnsley AQMA
18	Birmingham	187	Birmingham AQMA
19	Blaby	66	AQMA1
26	Spelthorne	54	Spelthorne AQMA
36	Bristol City Council	10	Bristol AQMA
52	Charnwood	15	Loughborough AQMA
63	City Of York	88	York AQMA
69	Coventry City Council	216	AQMA No.2
80	Doncaster	90	A1(M)/Warmsworth Road Junction, Balby Road Area
80	Doncaster	91	Carr House Road Area
82	Dudley	190	Brierley Hill AQMA
143	Leeds City Council	73	AQMA 1 Ebor Gardens
143	Leeds City Council	517	AQMA 7 Dewsbury Road
144	Leicester City Council	35	Leicester AQMA
155	Manchester City Council	36	Manchester AQMA
169	Newcastle City Council	238	Newcastle upon Tyne AQMA No.1
187	Norwich City Council	209	Norwich City Council AQMA No.3 (Castle AQMA)
193	Oxford City Council	45	Oxford AQMA
213	Rotherham	46	Rotherham AQMA 1 - Part1 (NO2)
213	Rotherham	47	Rotherham AQMA 1 - Part 2 (NO2)
213	Rotherham	257	Fitzwilliam Road (NO2) AQMA
213	Rotherham	259	Wortley Road (NO2) AQMA
220	Salford City Council	134	Salford AQMA
222	Sandwell	169	Oldbury AQMA
222	Sandwell	171	Great Barr NW
222	Sandwell	172	Great Barr South
222	Sandwell	174	Great Barr SW
229	Sheffield City Council	51	City Centre Air Action Zone
229	Sheffield City Council	52	M1 Corridor Air Action Zone
270	Tameside	109	Tameside AQMAs
286	Trafford	84	Trafford AQMA
292	Wakefield City	225	Wakefield M1 AQMA
314	Winchester City Council	220	Winchester Town Centre AQMA
318	Wokingham	129	Wokingham AQMA

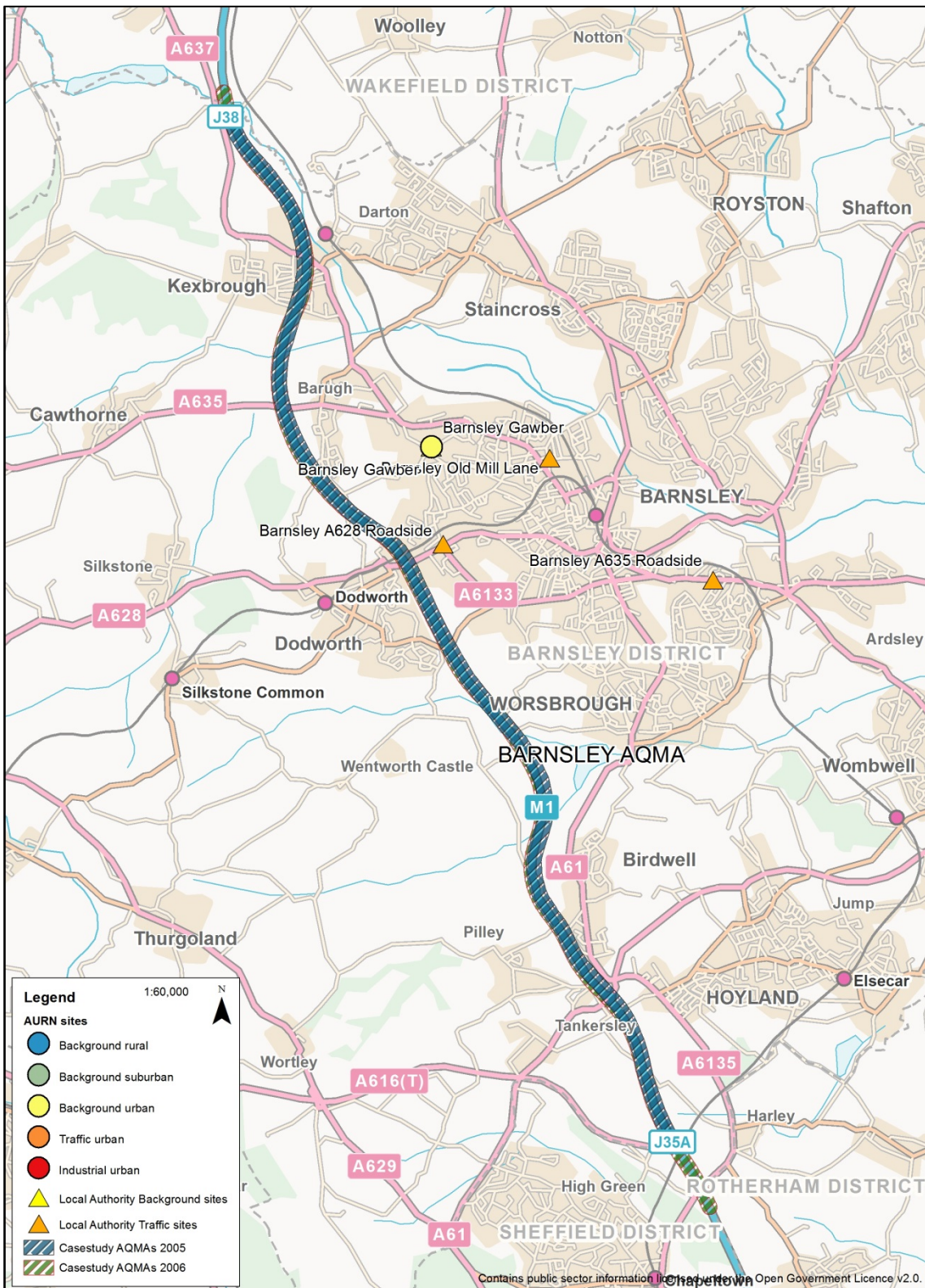
**Appendix 7. Table 20: Local Authorities and AQMAs with AURN and LA monitoring sites that meet siting and data capture criteria**

LA ID	Local Authority	AQMA ID	AQMA Title	AURN Traffic Urban sites	AURN Background Urban sites	LA Traffic sites	LA Background sites
10	Barnsley	6	Barnsley AQMA	N/A	Barnsley Gawber	Barnsley A628 Roadside	N/A
36	Bristol City Council	10	Bristol AQMA	Old Market <sup>1</sup>	AURN St. Pauls	Newfoundland Road Police Station/ Shiner's Garage/ Parson Street School/ Wells Road/ Bath Road	Rupert Street <sup>2</sup> / Brislington Depot
63	City Of York	88	York AQMA	N/A	N/A	Gillygate/ Fishergate/ Holgate/ Nunnery Lane/ Lawrence Street/ Heworth Green	Bootham
144	Leicester City Council	35	Leicester AQMA	N/A	Leicester Centre <sup>1</sup>	Abbey Lane/ Imperial Avenue/ London Road/ St Matthews Way/ Uppingham Road/ Vaughan Way/ Glenhills Way/ Melton Road	N/A
193	Oxford City Council	45	Oxford AQMA	Oxford Centre Roadside	N/A	N/A	High Street <sup>2</sup> / St Ebbe's AUN
222	Sandwell	171	Great Barr NW	N/A	Sandwell West Bromwich <sup>1</sup>	Wilderness Lane (Great Barr)	N/A
222	Sandwell	172	Great Barr South	N/A	Sandwell West Bromwich <sup>1</sup>	Wilderness Lane (Great Barr)	N/A
222	Sandwell	174	Great Barr SW	N/A	Sandwell West Bromwich <sup>1</sup>	Wilderness Lane (Great Barr)	N/A

<sup>1</sup> These AURN sites do not meet EU siting criteria (Eaton, 2010); <sup>2</sup> These sites are more representative of a Traffic site

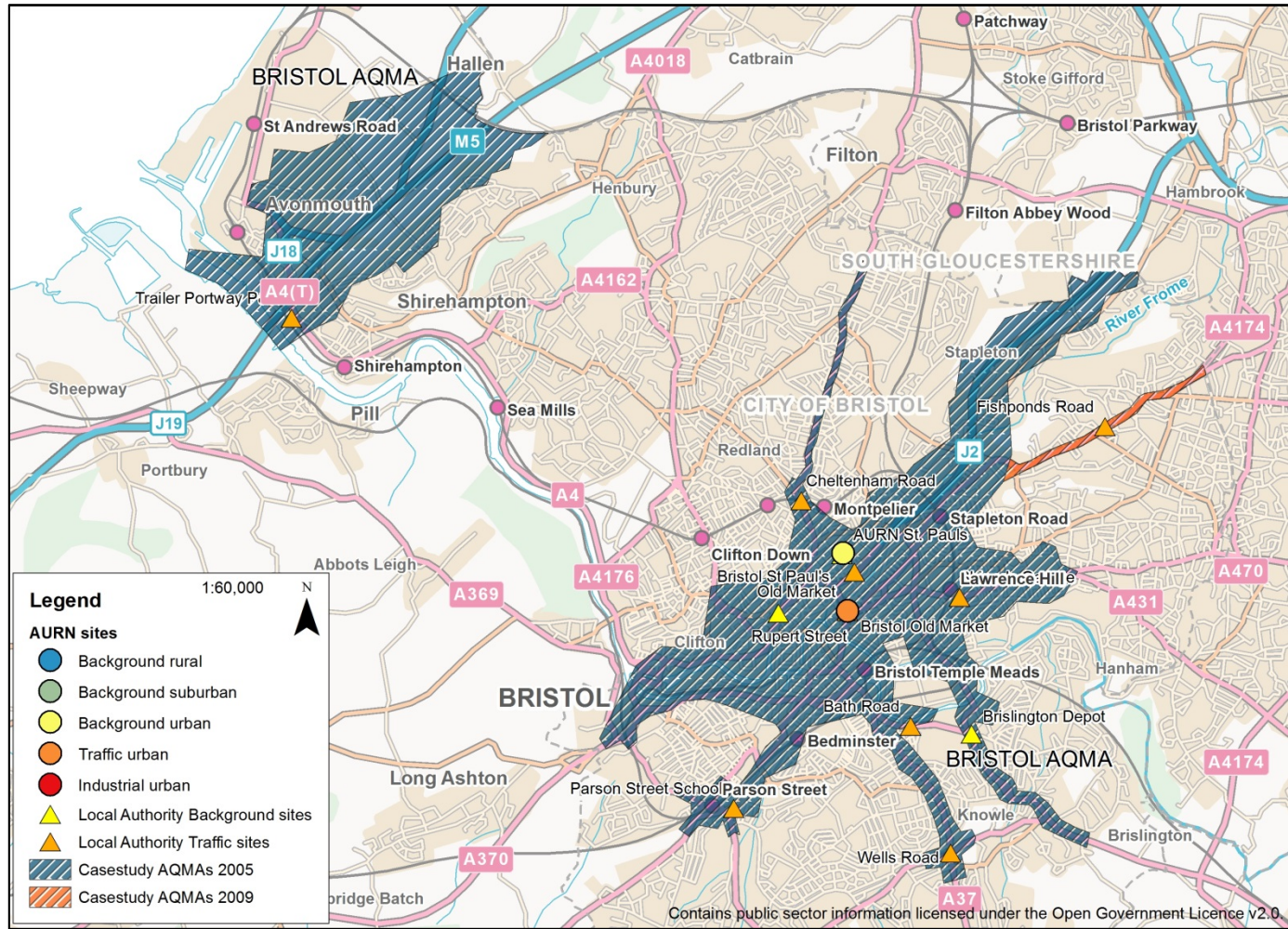


## Appendix 8: Case study AQMA maps



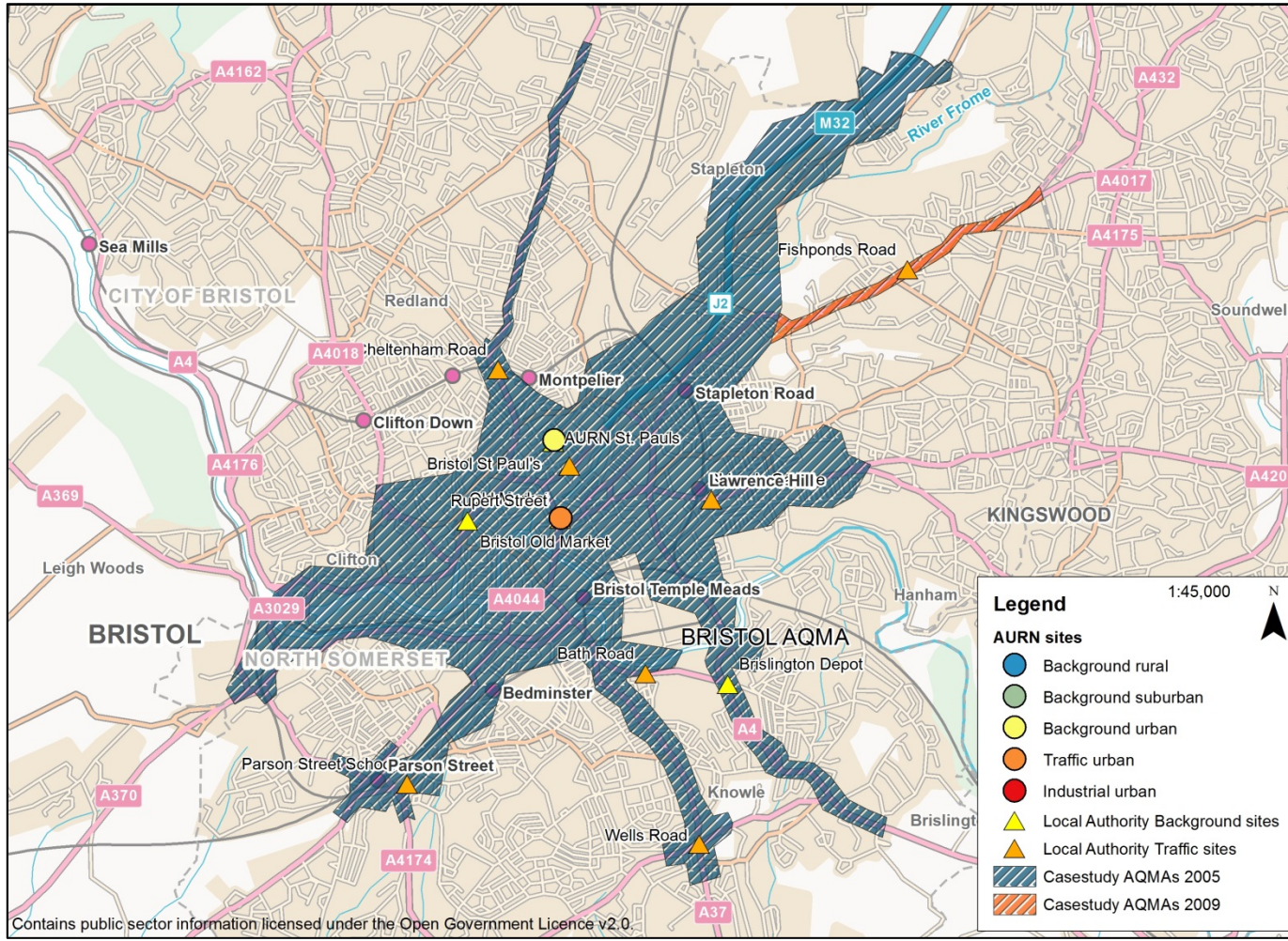
Appendix 8. Figure 1: Barnsley AQMA and monitoring sites





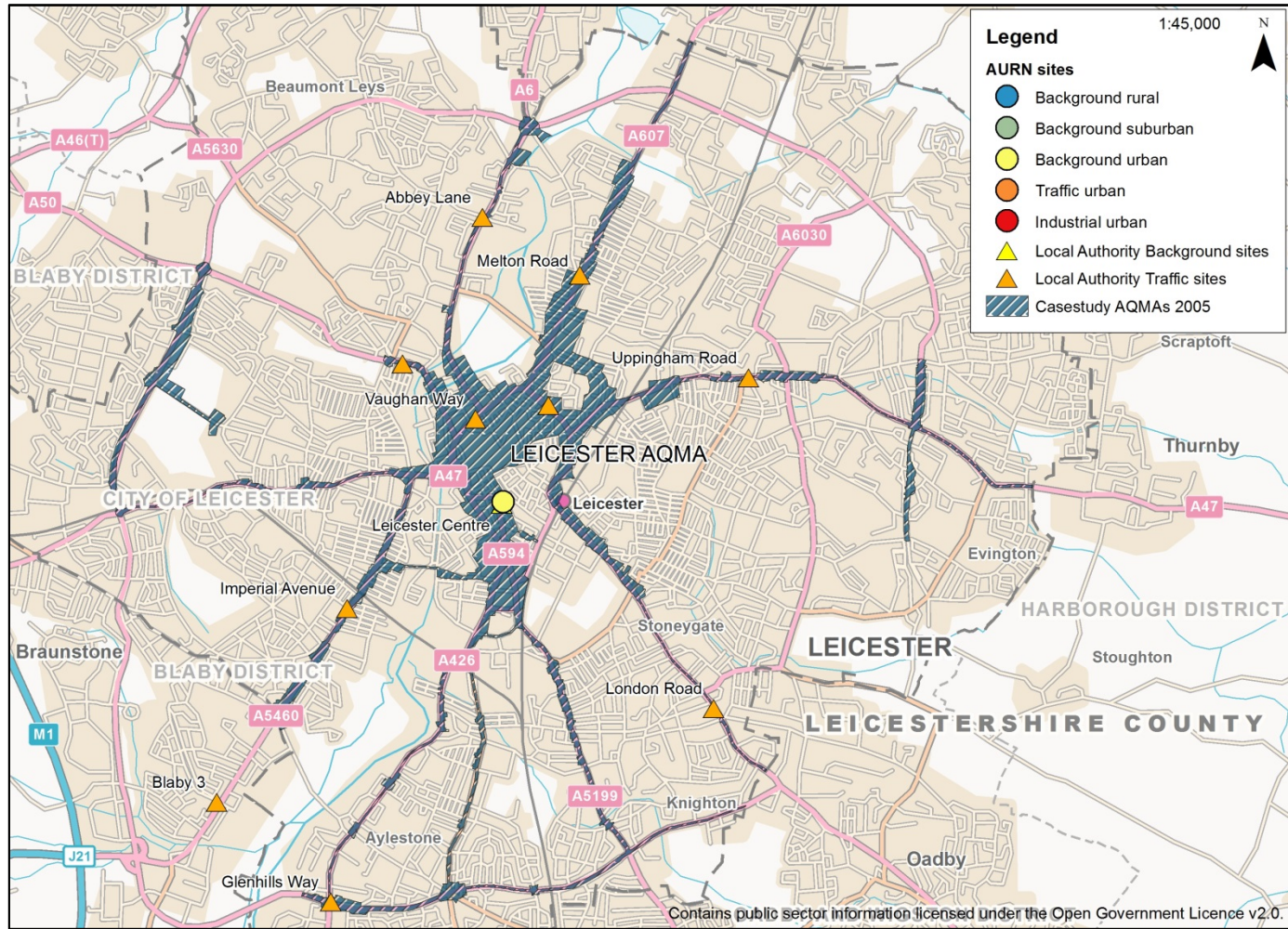
Appendix 8. Figure 2: Bristol AQMA and monitoring sites





Appendix 8. Figure 3: Bristol AQMA and monitoring sites (City Centre)



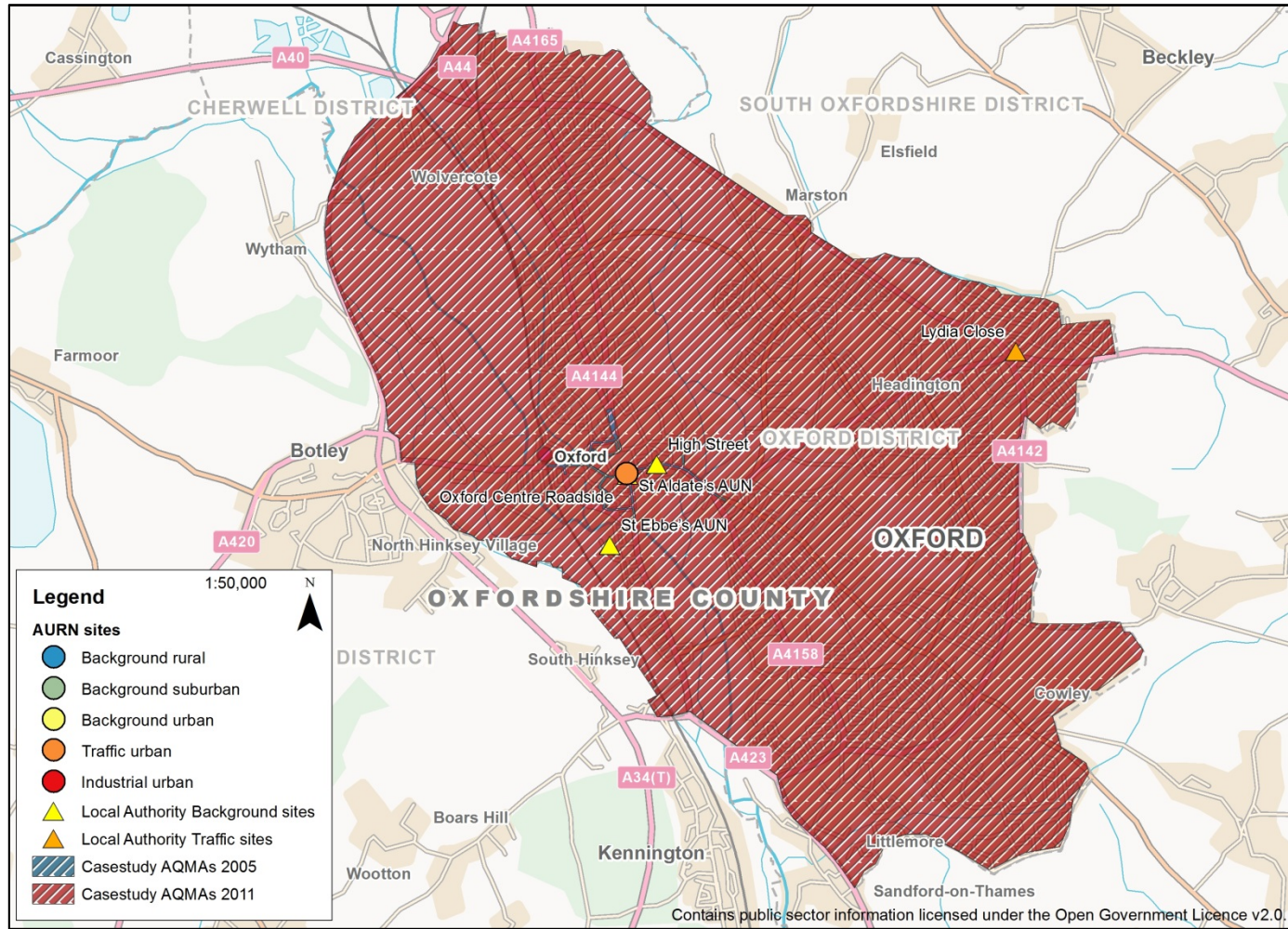


Appendix 8. Figure 4: Leicester AQMA and monitoring sites

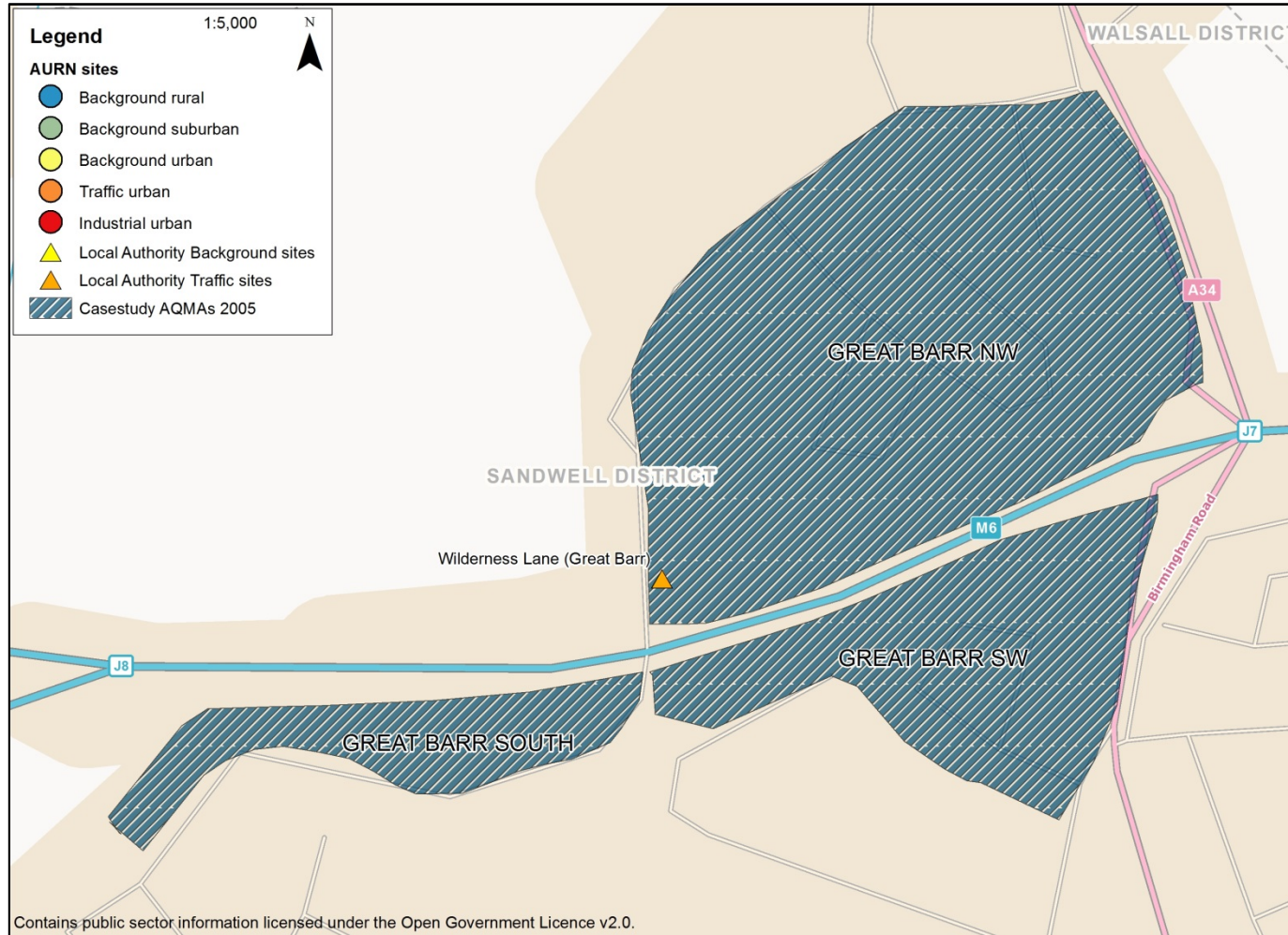


Appendix 8. Figure 5: Oxford AQMA and monitoring sites (2005 AQMA)



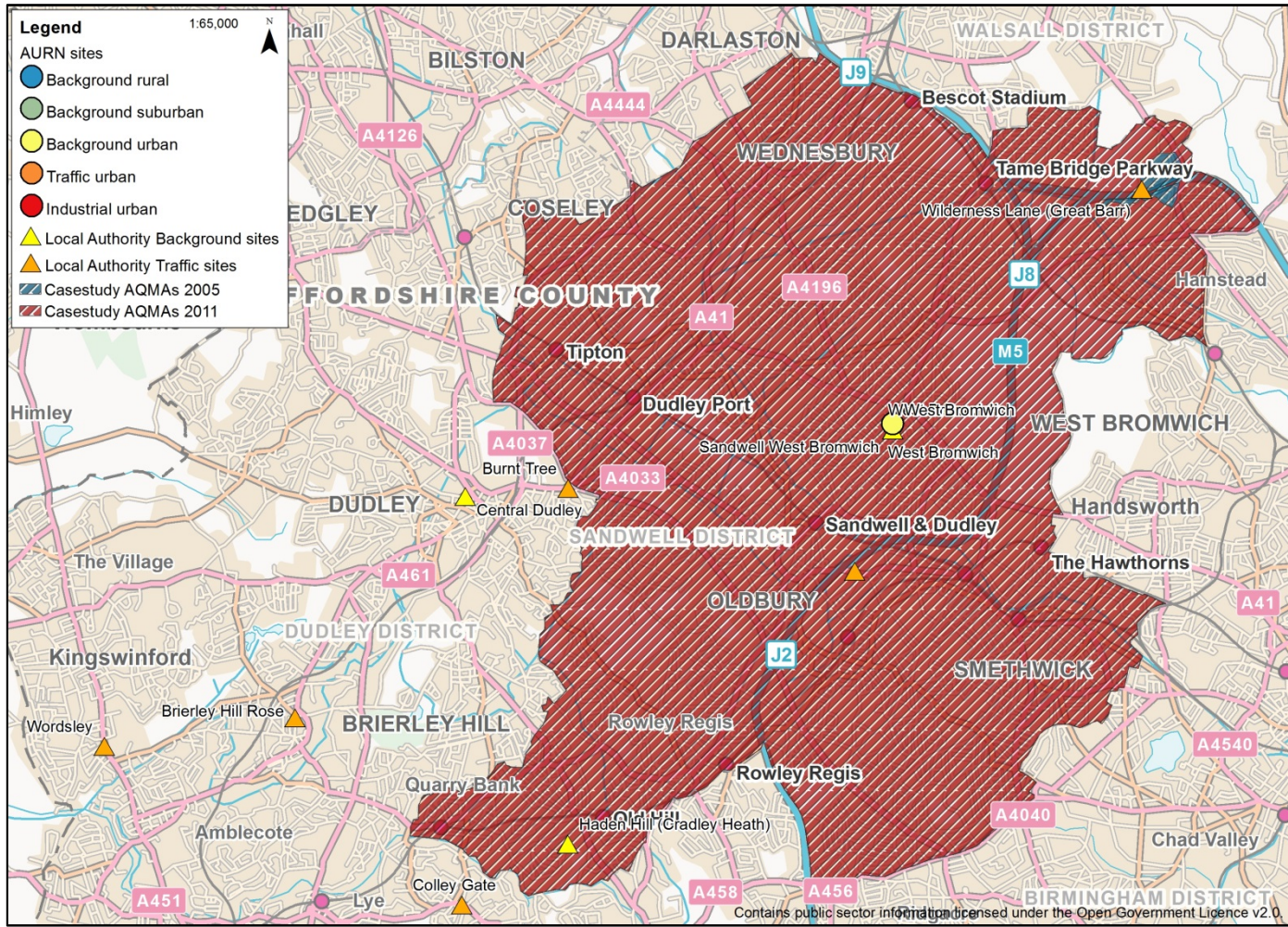


Appendix 8. Figure 6: Oxford AQMA and monitoring sites (whole borough)



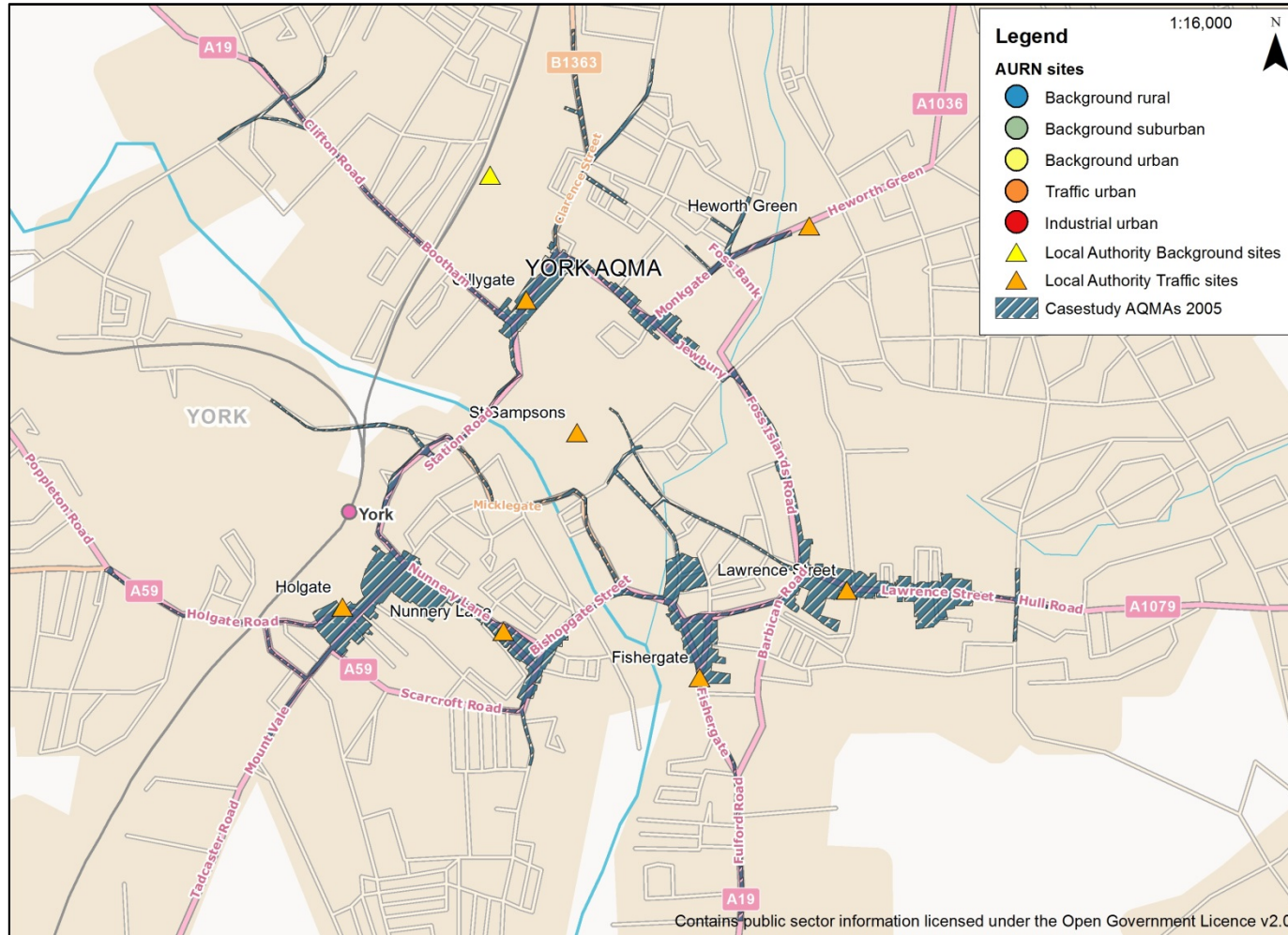
Appendix 8. Figure 7: Great Barr, NW, Great Barr South and Great Barr SW AQMAs and monitoring site, Sandwell MBC





Appendix 8. Figure 8: Sandwell AQMA and monitoring sites (whole borough)





Appendix 8. Figure 9: York AQMA and monitoring sites

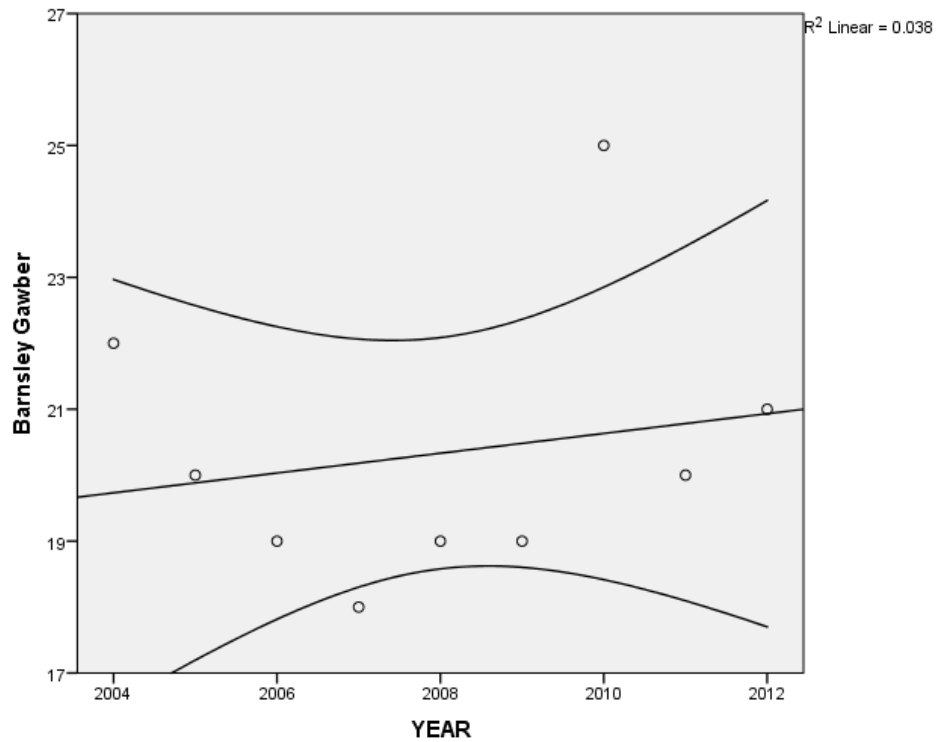
### Appendix 9: Case study monitoring data capture rates

Local authority	Site name	Site type	AURN/LA	2004	2005	2006	2007	2008	2009	2010	2011	2012
Barnsley	Barnsley Gawber	Background urban	AURN	96%	81%	77%	91%	91%	93%	94%	94%	94%
Barnsley	Barnsley A628 Roadside	Traffic urban	LA	85%	95%	98%	98%	87%	90%	98%	98%	
Bristol	AURN St. Pauls	Background urban	LA				92%	99%	97%	94%	98%	99%
Bristol	Bristol St Paul's	Background urban	AURN			54%	93%	99%	97%	94%	98%	99%
Bristol	Brislington Depot	Background urban	LA		91%		100%	95%	94%	99%	98%	90%
Bristol	Bristol Old Market	Traffic urban	AURN	99%	99%	99%	98%	99%	82%	77%	60%	58%
Bristol	Newfoundland Road Police Station	Traffic urban	LA		100%		99%	99%	98%	97%	86%	100%
Bristol	Bath Road	Traffic urban	LA				100%	97%	92%	98%	95%	94%
Bristol	Parson Street School	Traffic urban	LA		98%		99%	90%	100%	99%	92%	87%
Bristol	Shiner's Garage	Traffic urban	LA		100%		100%	99%	99%	98%	98%	99%
Bristol	Wells Road	Traffic urban	LA		89%		100%	98%	99%	98%	90%	83%
Bristol	Rupert Street	Traffic urban	LA	94%	100%		90%	99%	97%	97%	78%	88%
Leicester	Leicester Centre	Background urban	AURN	85%	97%	98%	99%	99%	93%	81%	70%	89%
Leicester	Glenhills Way	Traffic urban	LA	94%	97%	100%	99%	99%	99%	99%	97%	
Leicester	Abbey Lane	Traffic urban	LA	96%	98%	97%	99%	99%	99%	98%	99%	
Leicester	Melton Road	Traffic urban	LA	88%	99%	99%	99%	100%	97%	92%	98%	
Leicester	Imperial Avenue	Traffic urban	LA	96%	99%	99%	99%	99%	98%	91%	98%	
Leicester	St Matthews Way	Traffic urban	LA	96%	98%	87%	99%	91%	97%	96%	88%	
Leicester	Uppingham Road	Traffic urban	LA	90%	99%	99%	94%	99%	99%	92%	75%	

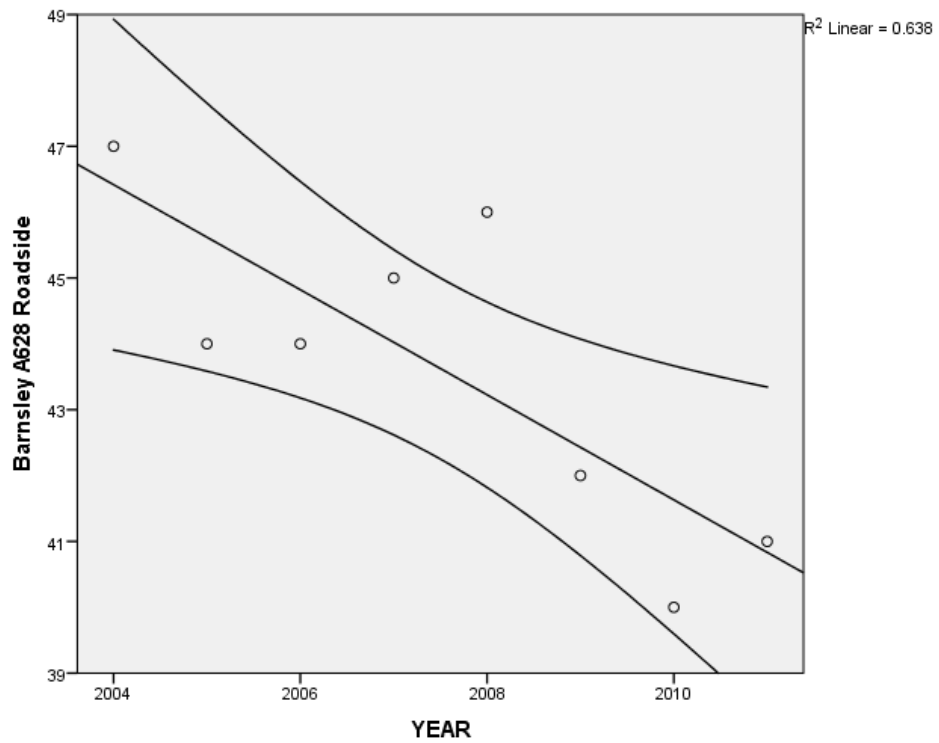
Local authority	Site name	Site type	AURN/LA	2004	2005	2006	2007	2008	2009	2010	2011	2012
Leicester	Vaughan Way	Traffic urban	LA		41%	99%	99%	99%	99%	99%	90%	
Leicester	London Road	Traffic urban	LA			84%	92%	97%	98%	97%	99%	
Oxford	Oxford St Ebbes	Background urban	AURN					82%	83%	96%	94%	83%
Oxford	Oxford Centre Roadside	Traffic urban	AURN	86%	98%	95%	95%	97%	97%	93%	98%	92%
Oxford	St Aldate's AUN	Traffic urban	LA		98%	95%	95%	97%	97%	94%	98%	
Oxford	St Ebbe's AUN	Background urban	LA		96%	94%	87%	82%	83%	96%	94%	
Oxford	High Street	Traffic urban	LA		90%	98%	97%	81%	77%	92%	94%	
Sandwell	Sandwell West Bromwich	Background urban	AURN	98%	96%	69%	99%	94%	99%	99%	99%	
Sandwell	Wilderness Lane (Great Barr)	Traffic urban	LA	85%	99%	99%	81%	92%	98%	100%		
York	Bootham	Background urban	LA	90%	99%	100%	97%	100%	100%	98%	98%	99%
York	Fishergate	Traffic urban	LA	89%	99%	92%	93%	100%	99%	94%	95%	99%
York	Gillygate	Traffic urban	LA	83%	98%	84%	95%	93%	95%	83%	100%	95%
York	Heworth Green	Traffic urban	LA			98%	96%	87%	96%	82%	100%	95%
York	Holgate	Traffic urban	LA	76%	95%	76%	98%	73%	97%	92%	92%	91%
York	Lawrence Street	Traffic urban	LA	87%	97%	76%	94%	93%	67%	98%	94%	98%
York	Nunnery Lane	Traffic urban	LA	94%	97%	98%	76%	99%	97%	98%	80%	100%



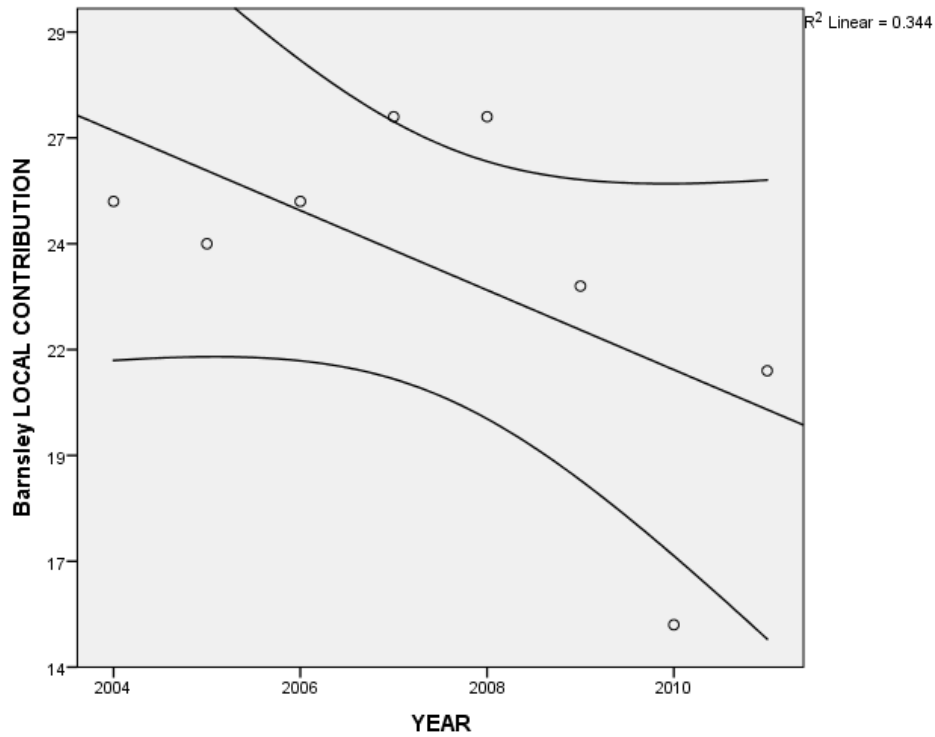
**Appendix 10: Case study regression analysis plots**



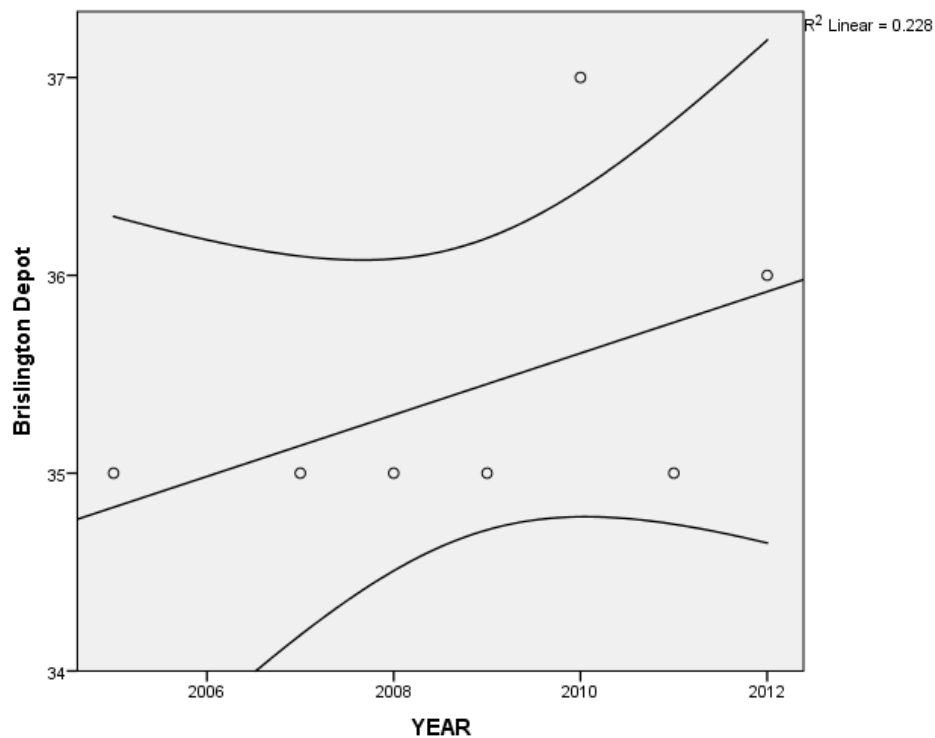
**Appendix 10. Figure 1: Barnsley Background Urban automatic monitoring data 2004-2012 showing Barnsley Gawber NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



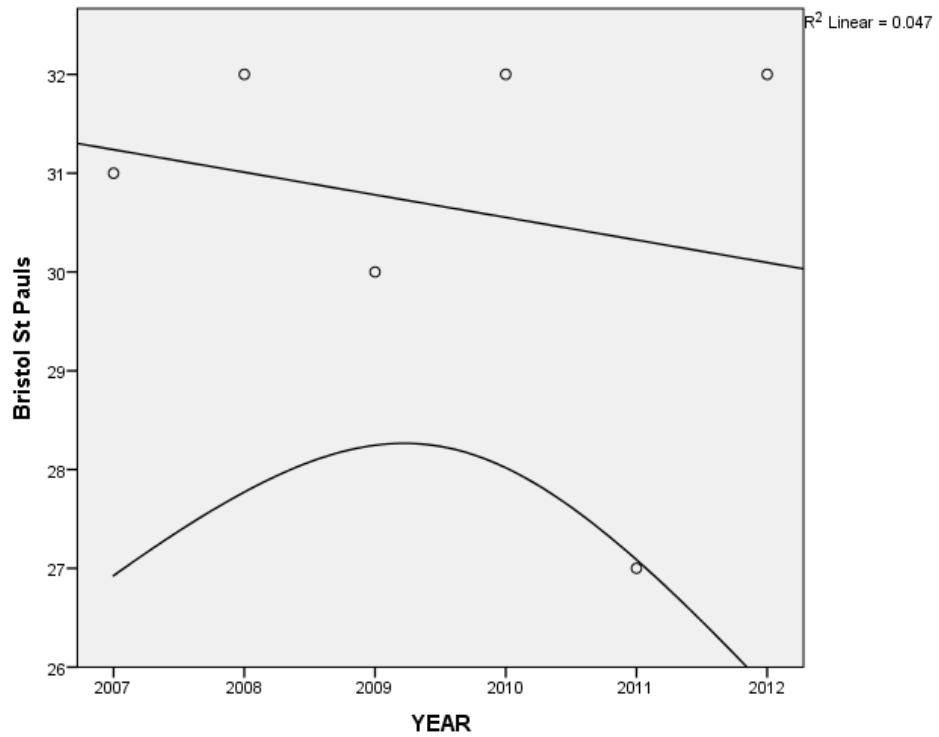
**Appendix 10. Figure 2: Barnsley Traffic Urban automatic monitoring data 2004-2011 showing Barnsley A626 NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



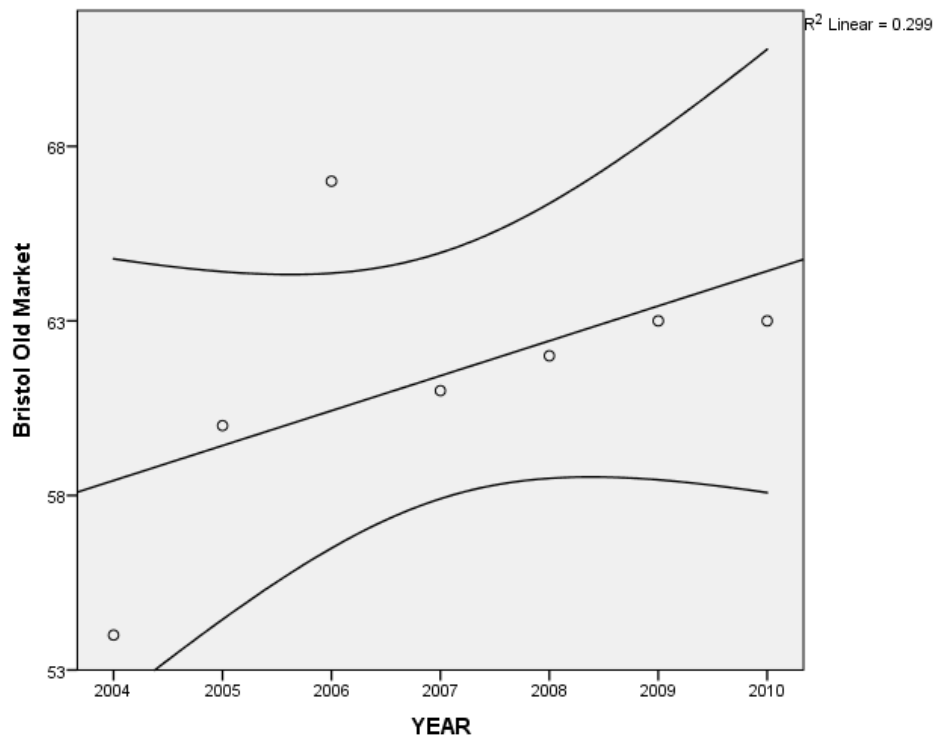
**Appendix 10. Figure 3: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2011 for Barnsley A628 Roadside showing linear regression line and 95% confidence intervals**



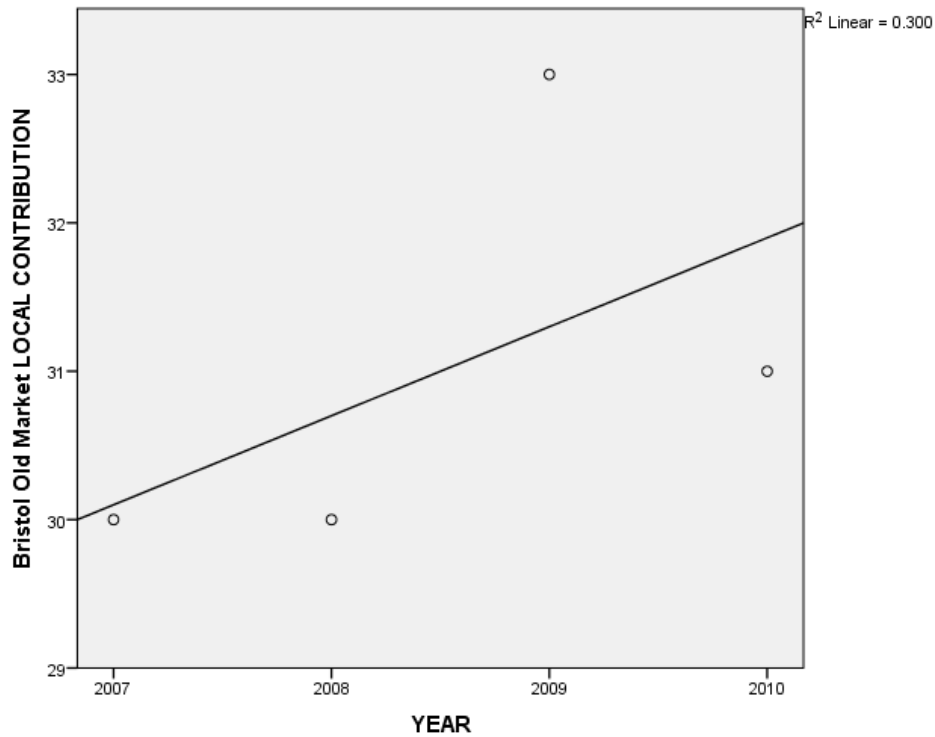
**Appendix 10. Figure 4: Bristol Background Urban automatic monitoring data 2005-2012 showing Brislington Depot NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



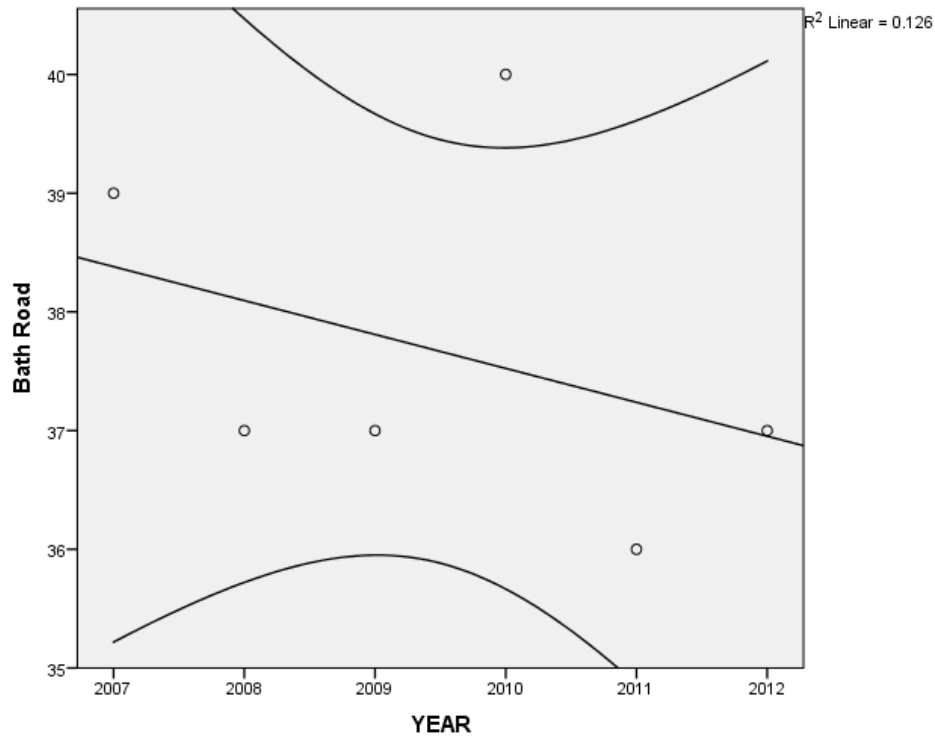
**Appendix 10. Figure 5: Bristol Background Urban automatic monitoring data 2007-2012 showing Bristol St Pauls NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



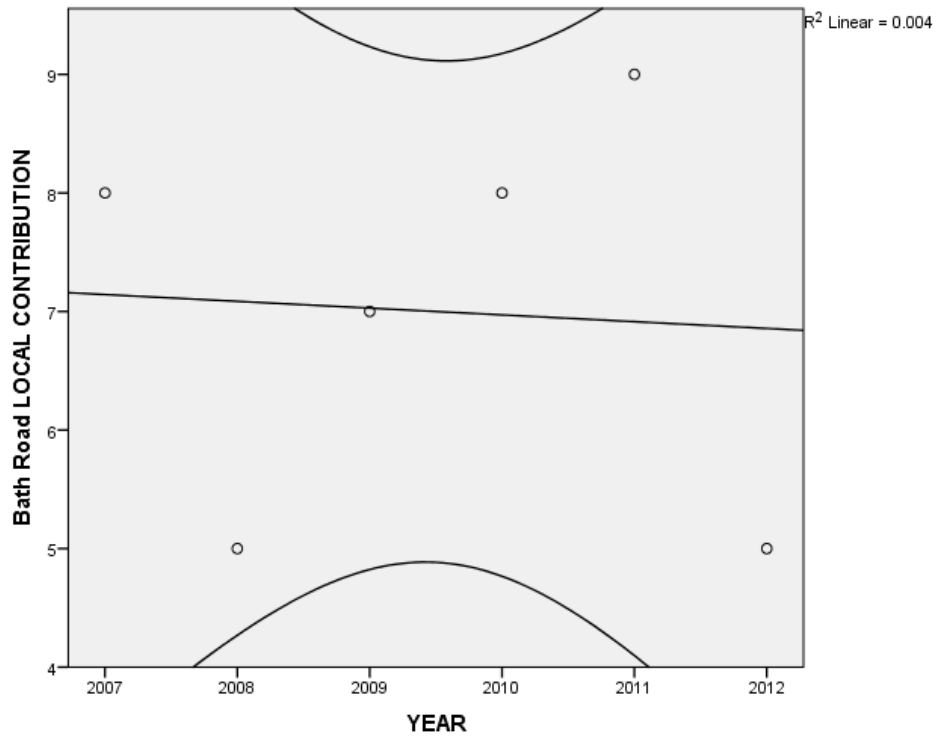
**Appendix 10. Figure 6: Bristol Traffic Urban automatic monitoring data 2004-2010 showing Bristol Old Market NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



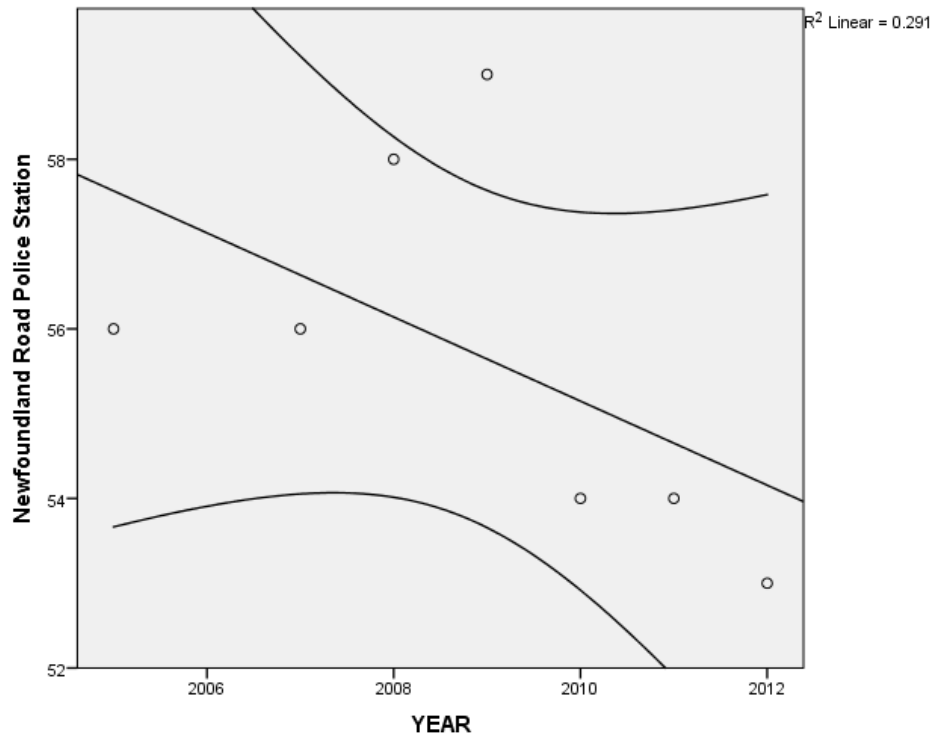
**Appendix 10. Figure 7: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2010 for Bristol Old Market and Bristol St Pauls showing linear regression line and 95% confidence intervals**



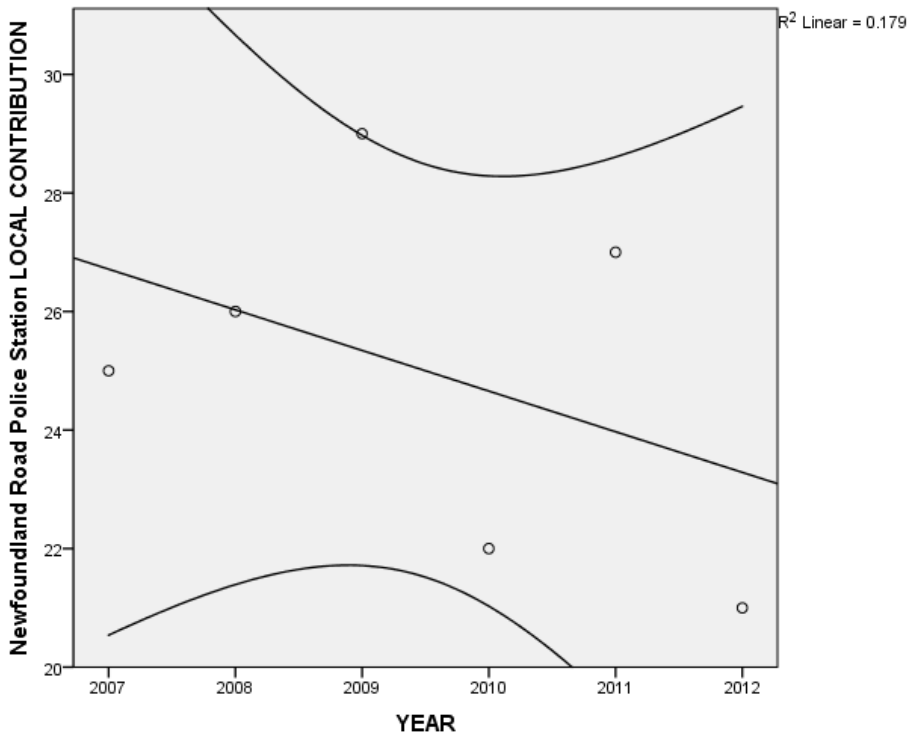
**Appendix 10. Figure 8: Bristol Traffic Urban automatic monitoring data 2007-2012 showing Bath Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



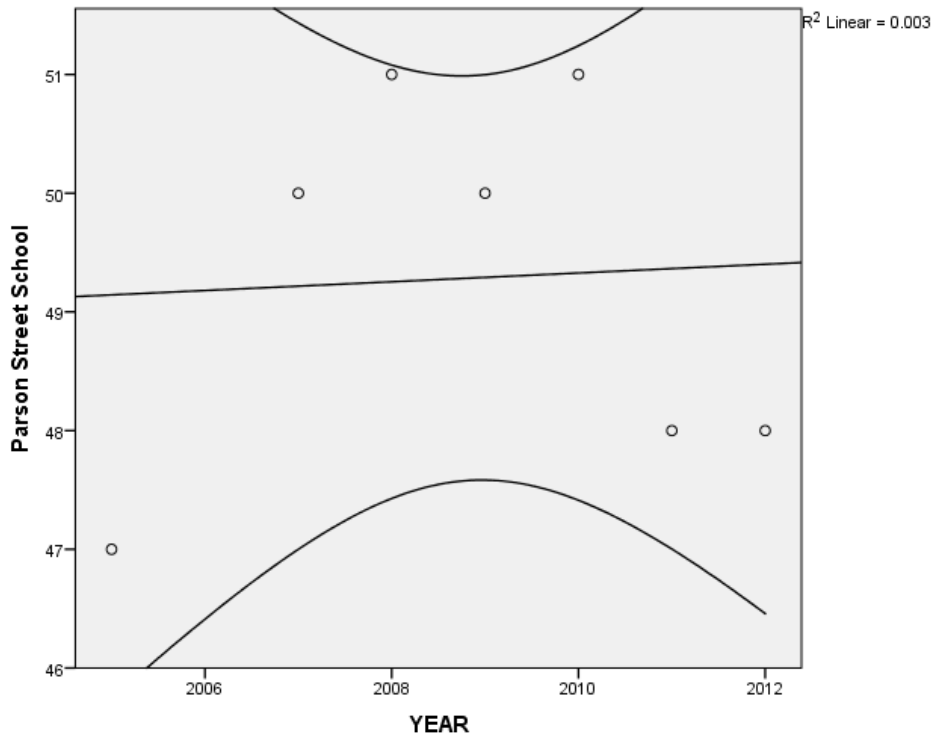
**Appendix 10. Figure 9: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2012 for Bath Road and Bristol St Pauls showing linear regression line and 95% confidence intervals**



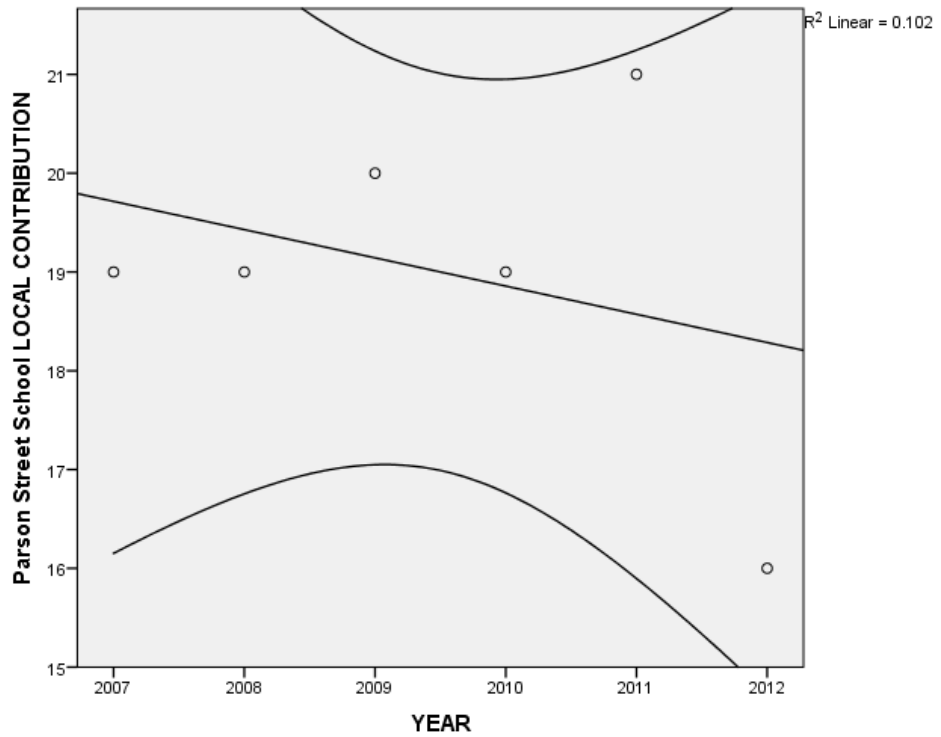
**Appendix 10. Figure 10: Bristol Traffic Urban automatic monitoring data 2005-2012 showing Newfoundland Road Police Station NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



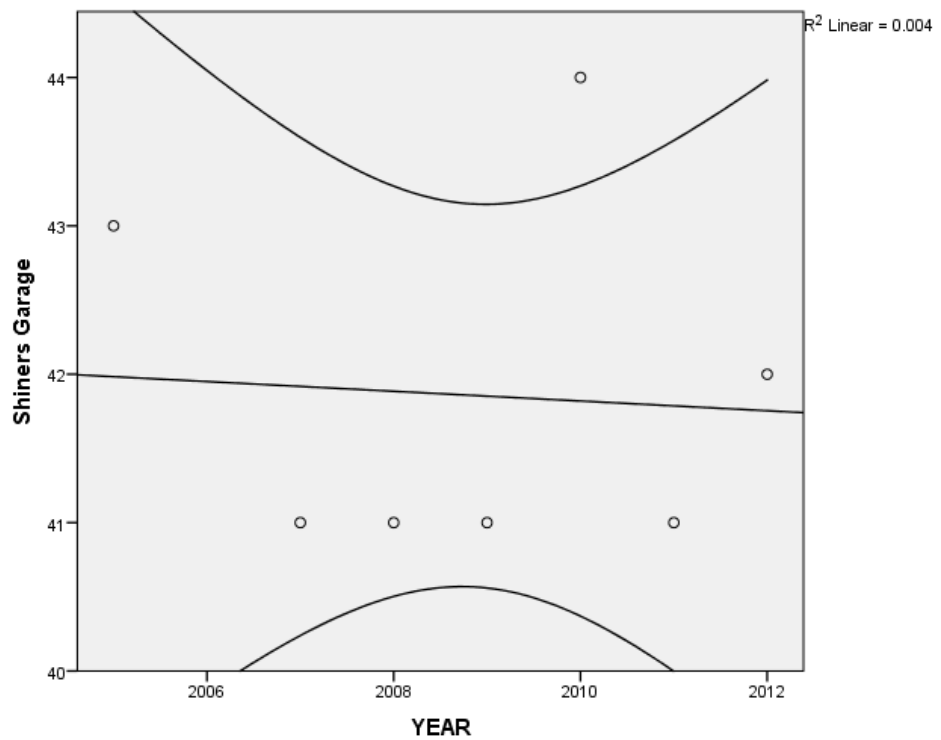
**Appendix 10. Figure 11: Calculated Local Contribution NO<sub>2</sub> annual means 20074-2012 for Newfoundland Road Police Station and Bristol St Pauls showing linear regression line and 95% confidence intervals**



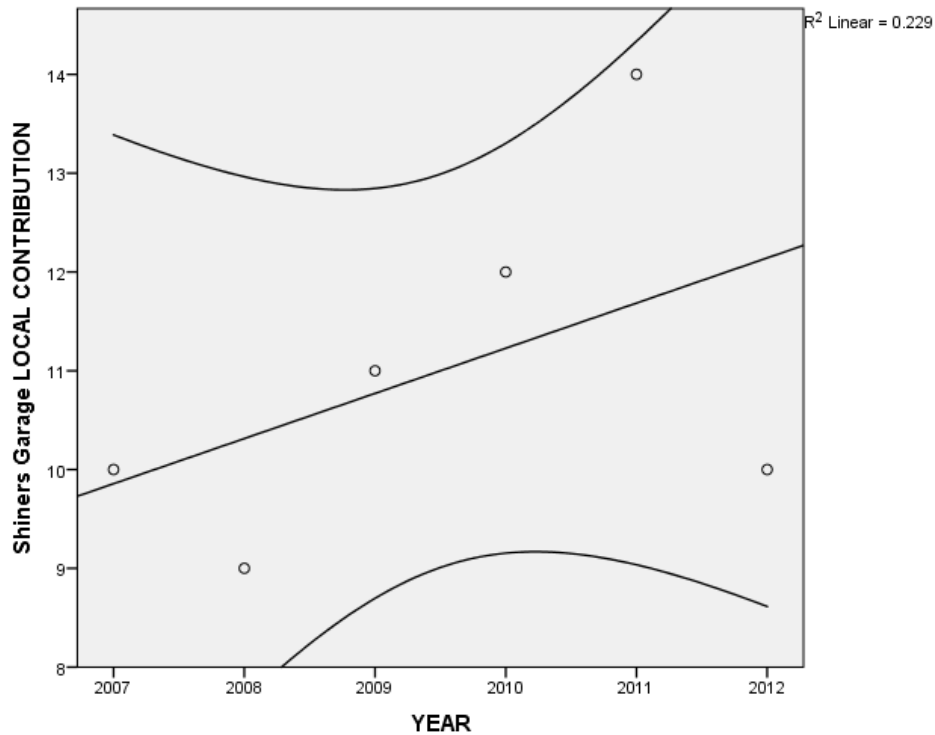
**Appendix 10. Figure 12: Bristol Traffic Urban automatic monitoring data 2005-2012 showing Parson Street School NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



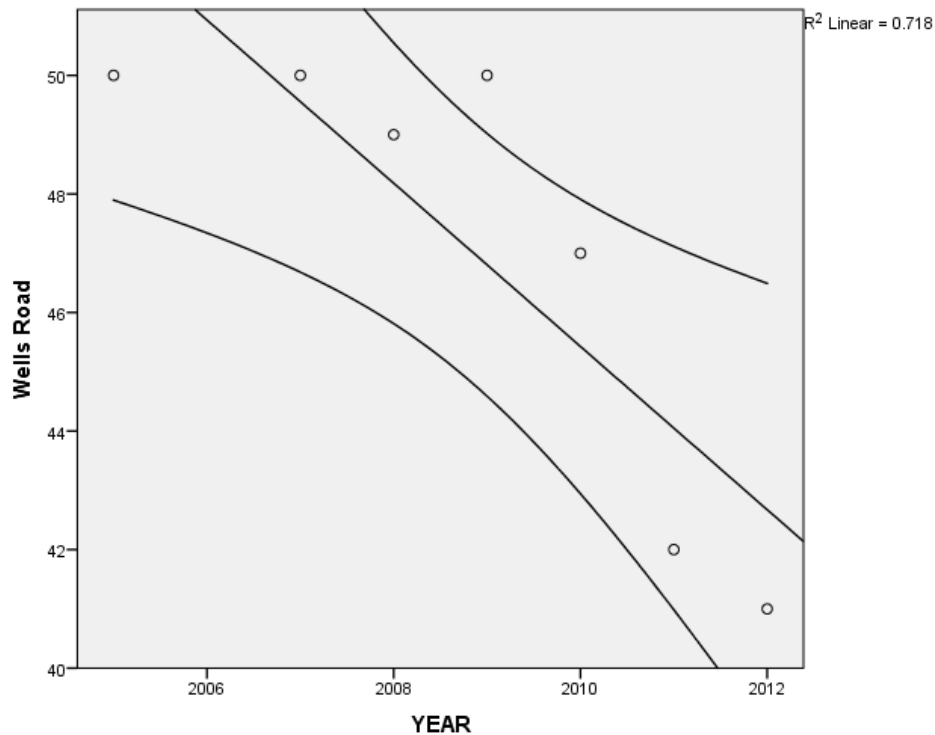
**Appendix 10. Figure 13: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2012 for Parson Street School and Bristol St Pauls showing linear regression line and 95% confidence intervals**



**Appendix 10. Figure 14: Bristol Traffic Urban automatic monitoring data 2005-2012 showing Shiner's Garage NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**

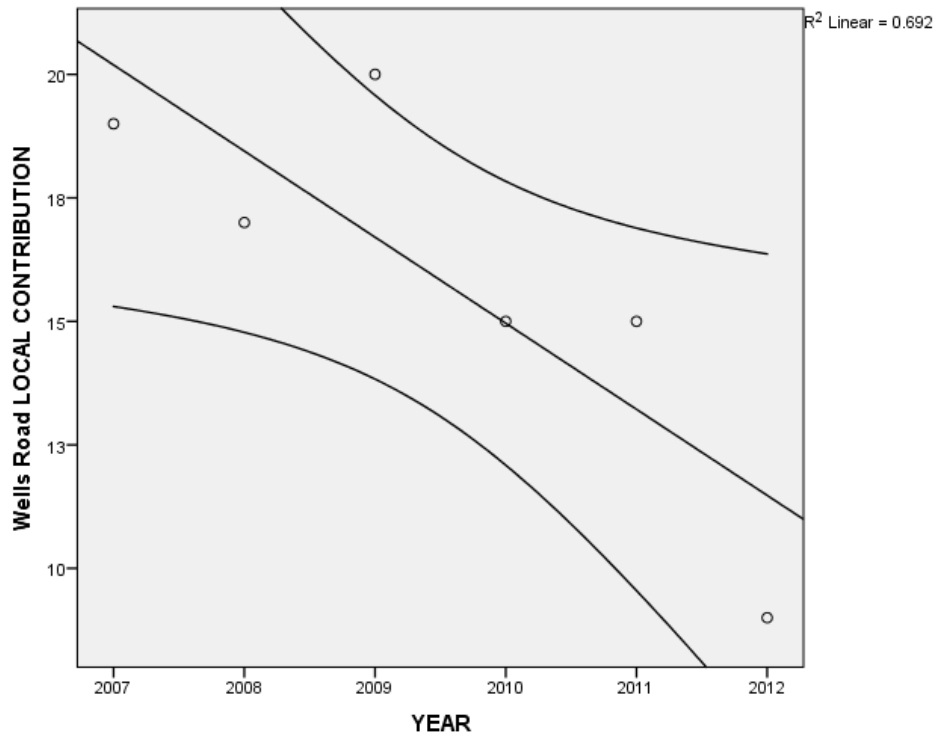


**Appendix 10. Figure 15: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2012 for Shiner's Garage and Bristol St Pauls showing linear regression line and 95% confidence intervals**

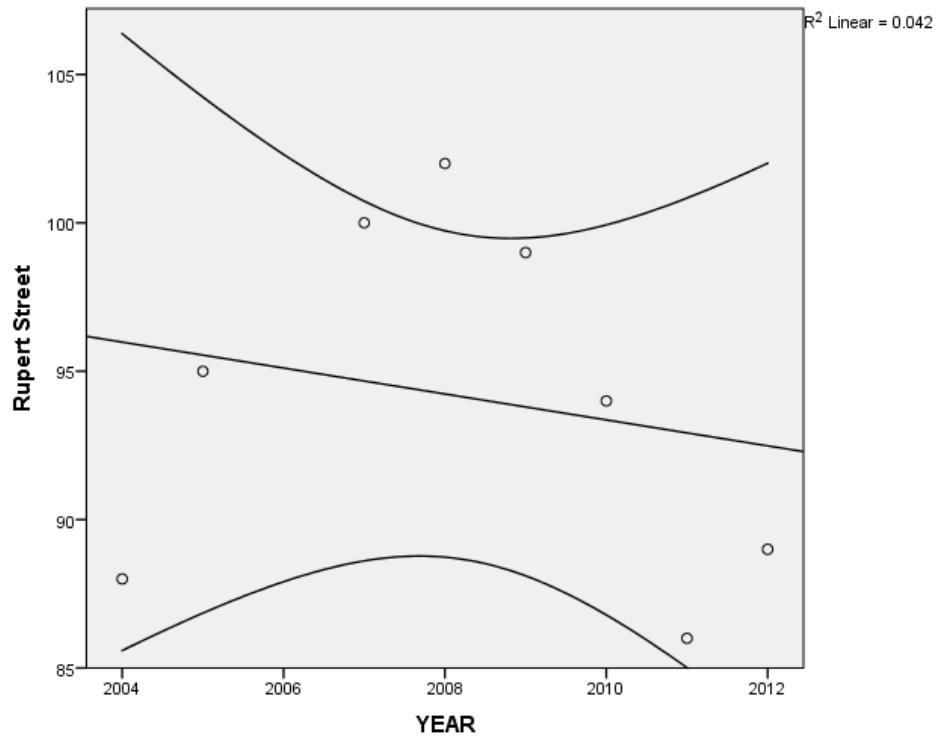


**Appendix 10. Figure 16: Bristol Traffic Urban automatic monitoring data 2005-2012 showing Wells Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**

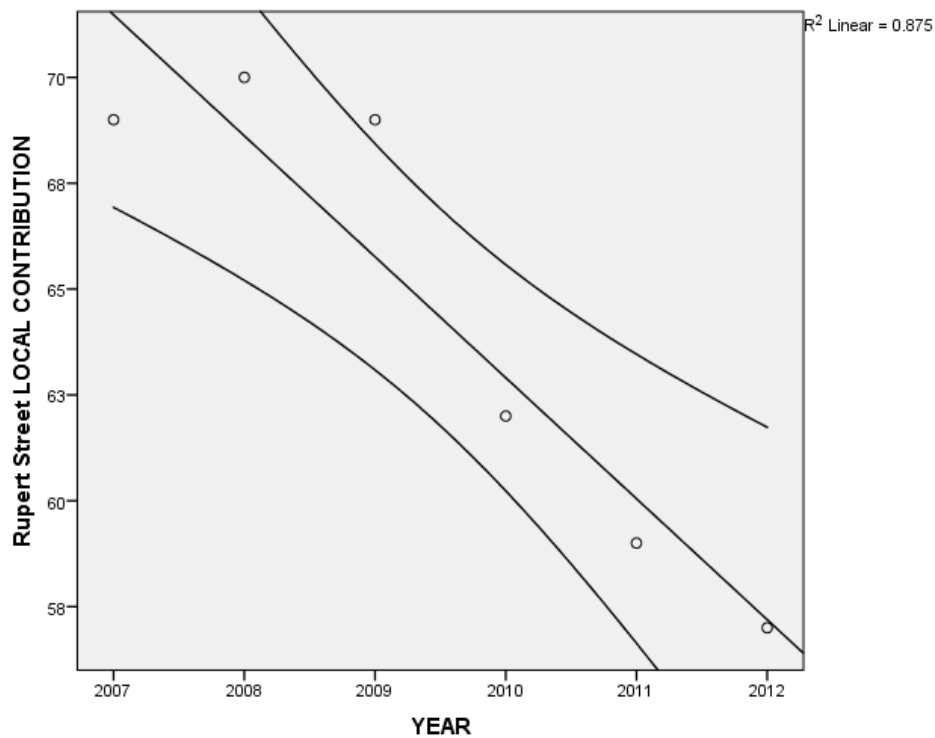




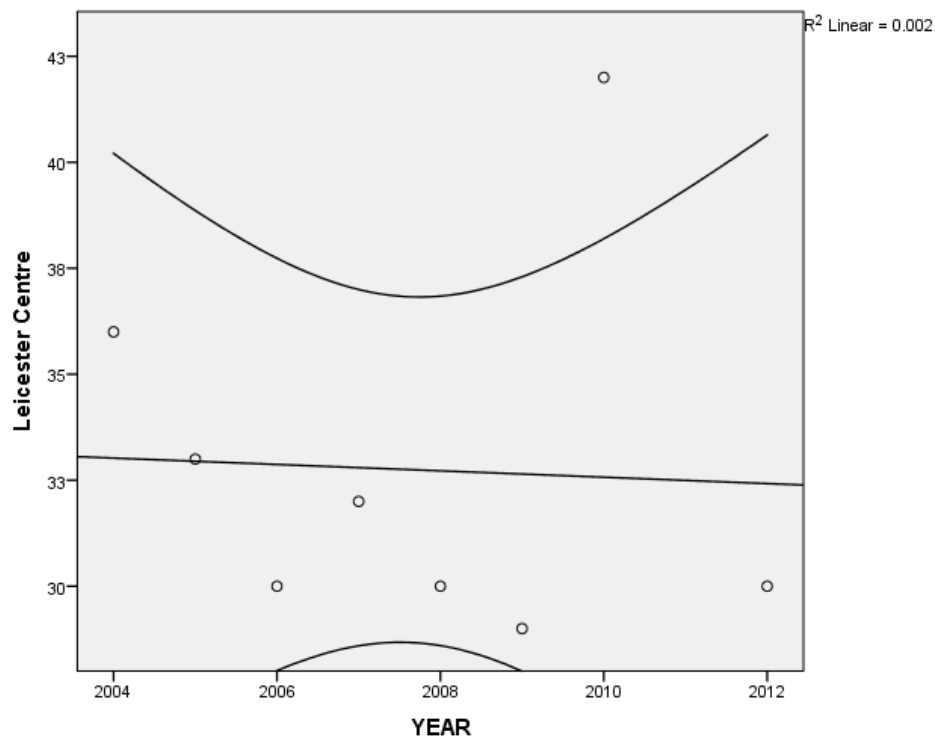
**Appendix 10. Figure 17: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2012 for Wells Road and Bristol St Pauls showing linear regression line and 95% confidence intervals**



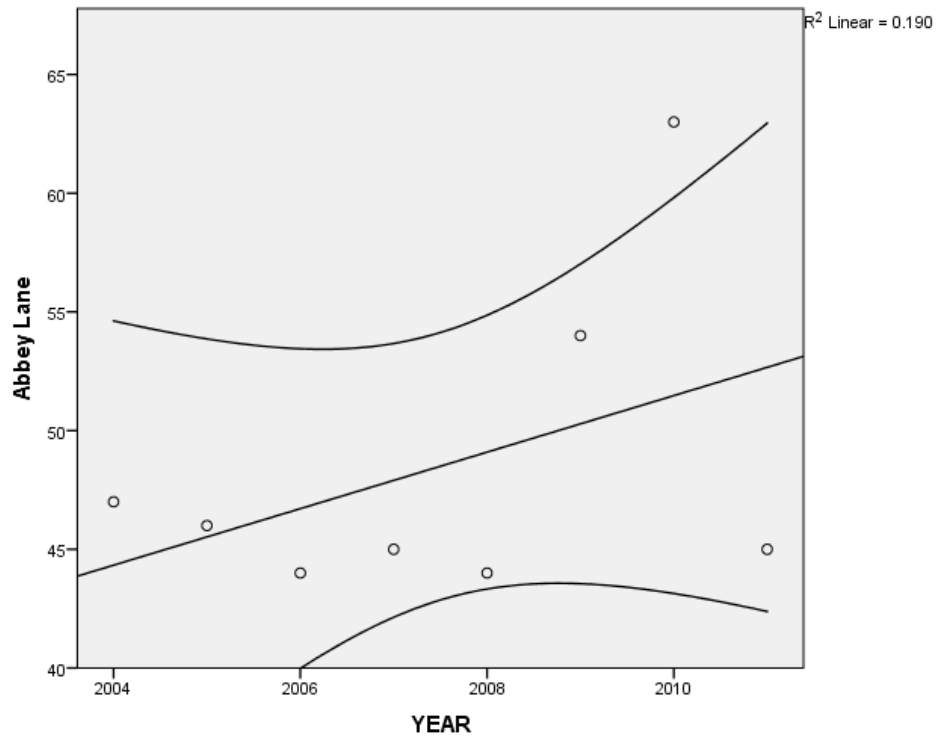
**Appendix 10. Figure 18: Bristol Traffic Urban automatic monitoring data 2004-2012 showing Rupert Street NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



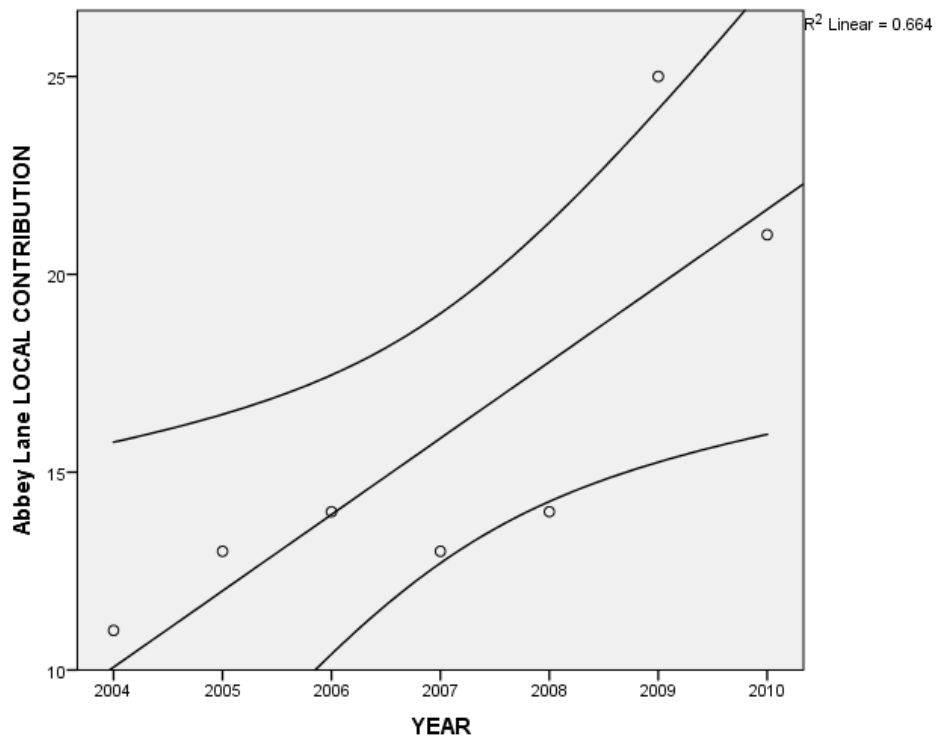
**Appendix 10. Figure 19: Calculated Local Contribution NO<sub>2</sub> annual means 2007-2011 for Rupert Street and Bristol St Pauls showing linear regression line and 95% confidence intervals**



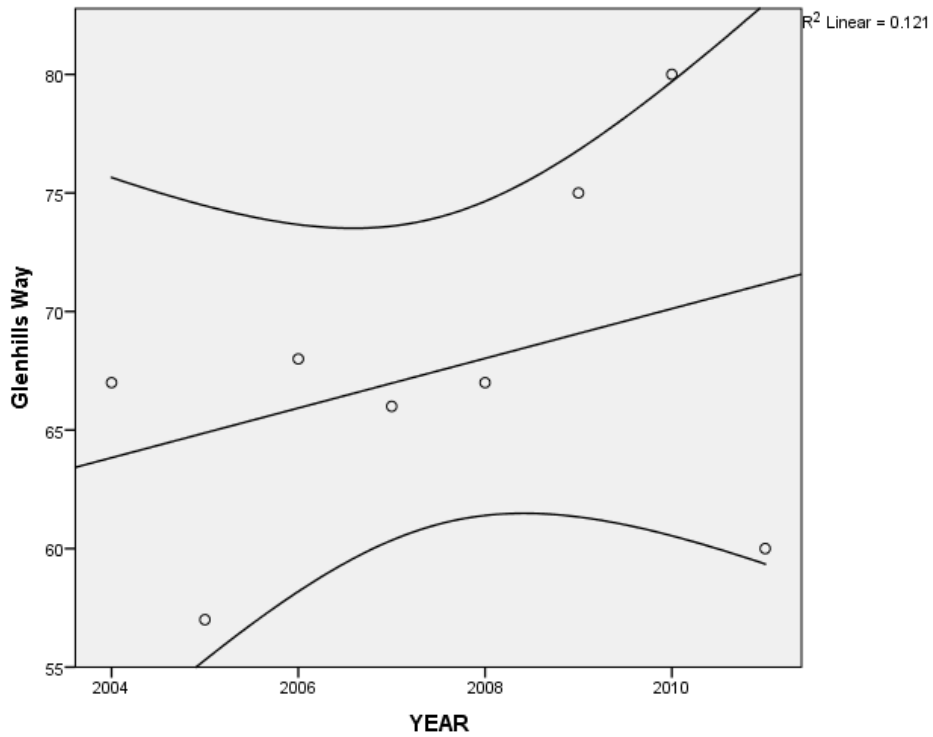
**Appendix 10. Figure 20: Leicester Background Urban automatic monitoring data 2004-2012 showing Leicester Centre NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



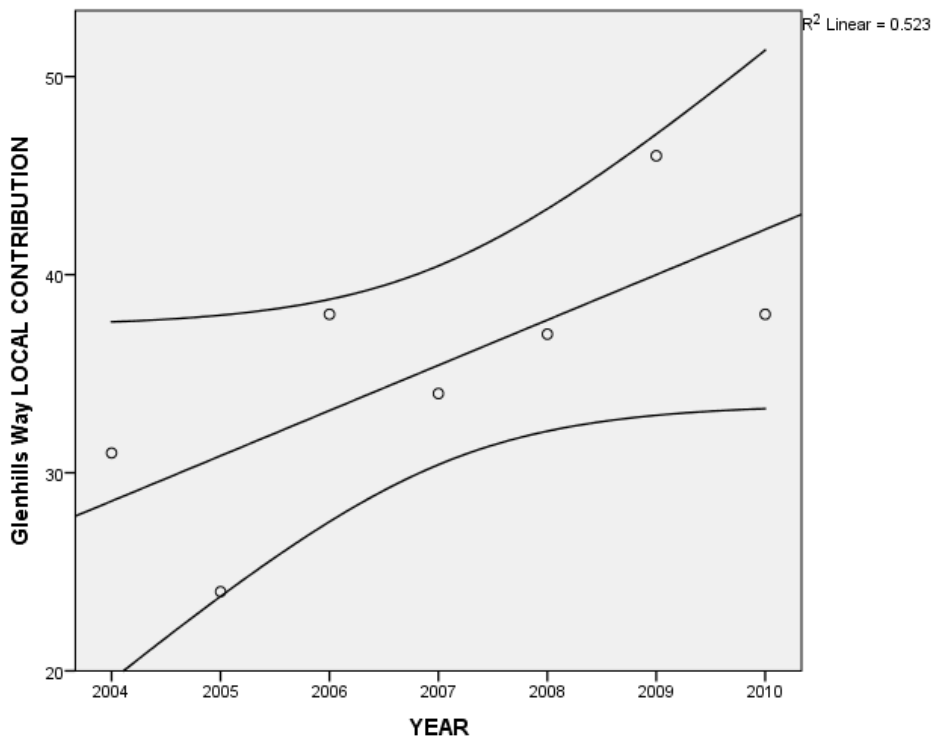
**Appendix 10. Figure 21: Leicester Traffic Urban automatic monitoring data 2004-2011 showing Abbey Lane NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



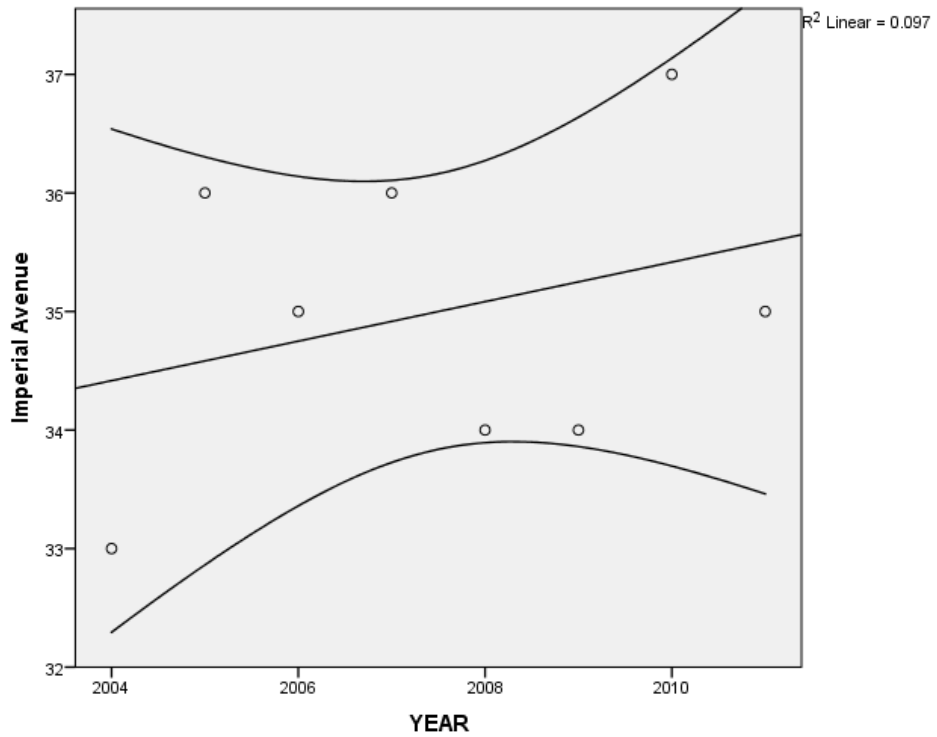
**Appendix 10. Figure 22: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Abbey Lane and Leicester Centre showing linear regression line and 95% confidence intervals**



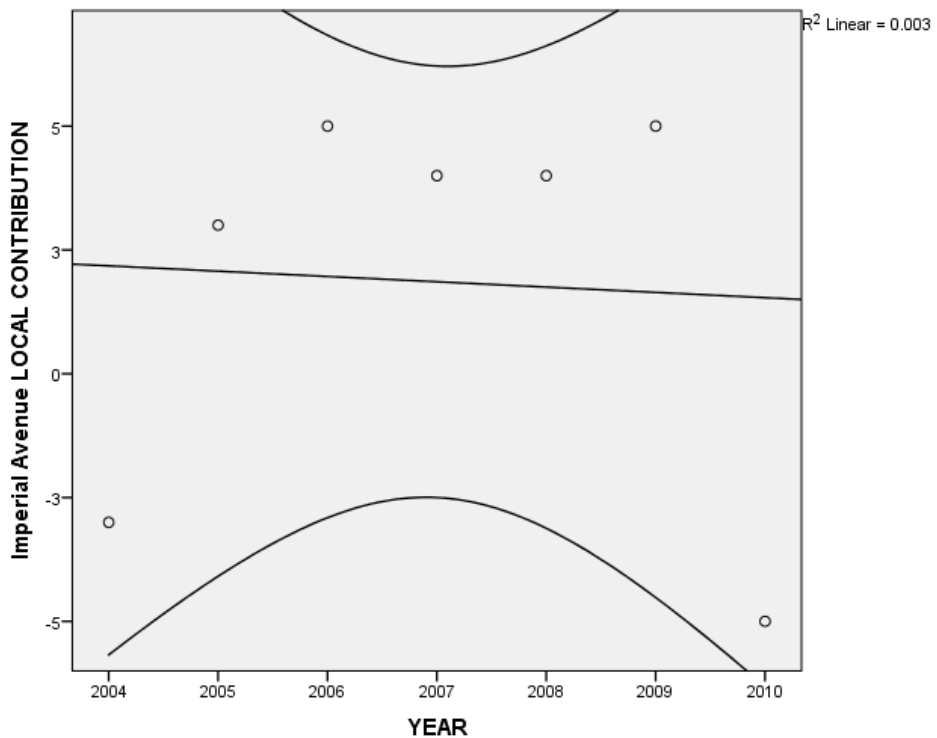
Appendix 10. Figure 23: Leicester Traffic Urban automatic monitoring data 2004-2011 showing Glenhills Way NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



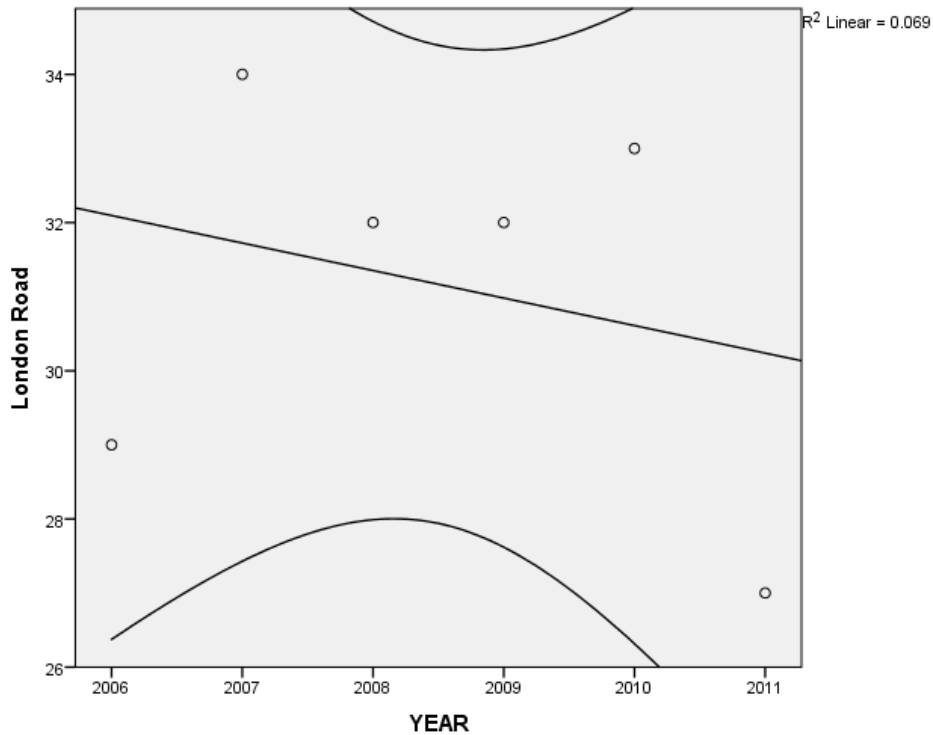
Appendix 10. Figure 24: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Glenhills Way and Leicester Centre showing linear regression line and 95% confidence intervals



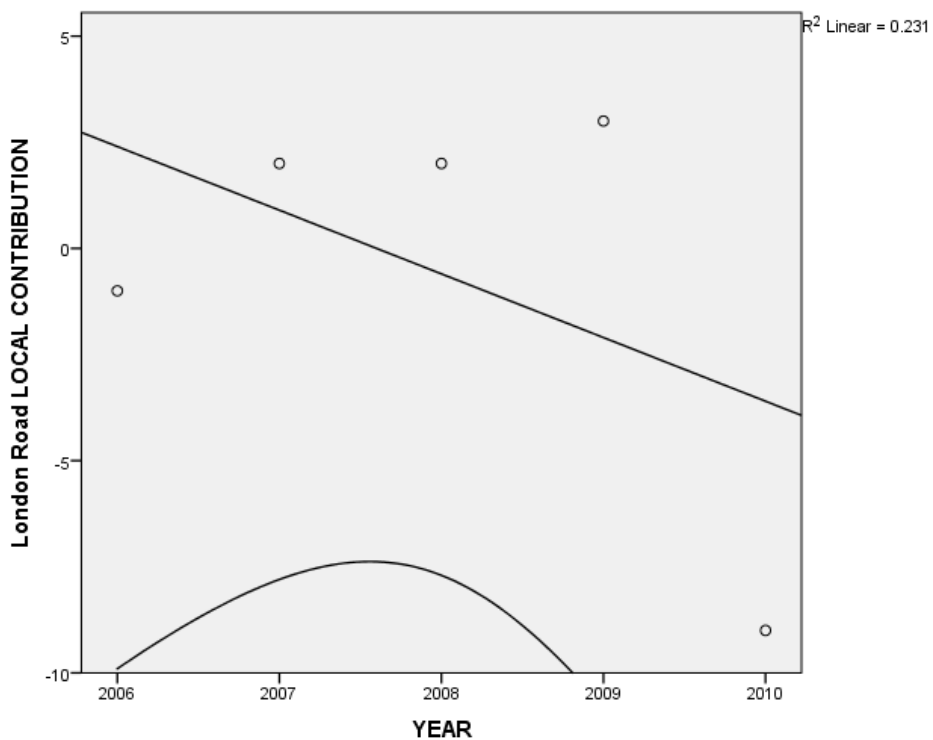
**Appendix 10. Figure 25: Leicester Traffic Urban automatic monitoring data 2004-2011 showing Imperial Lane NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



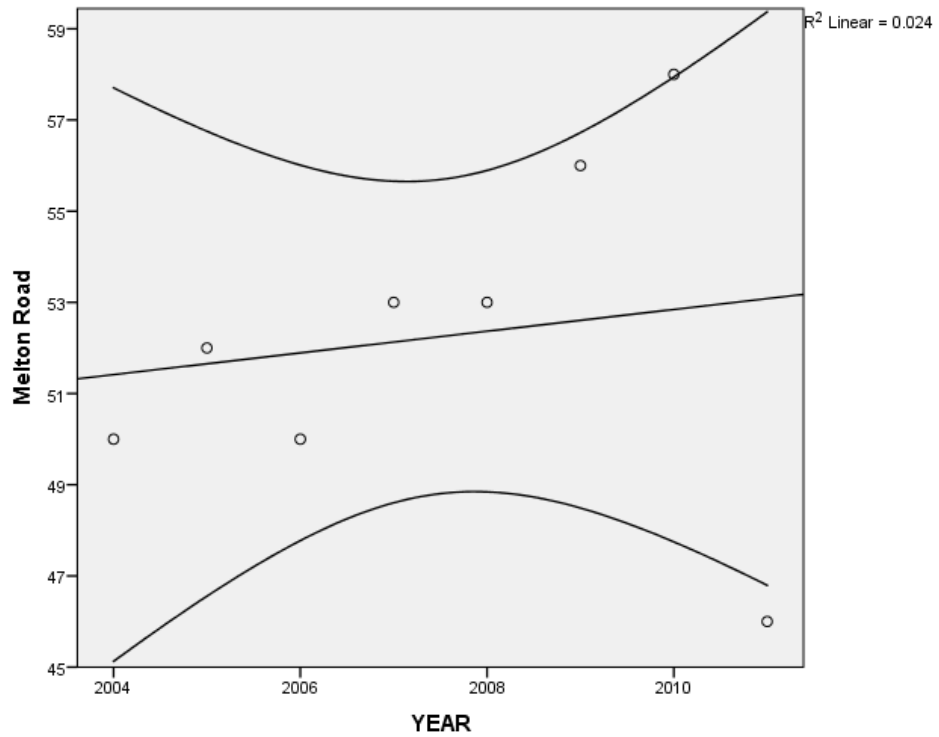
**Appendix 10. Figure 26: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Imperial Lane and Leicester Centre showing linear regression line and 95% confidence intervals**



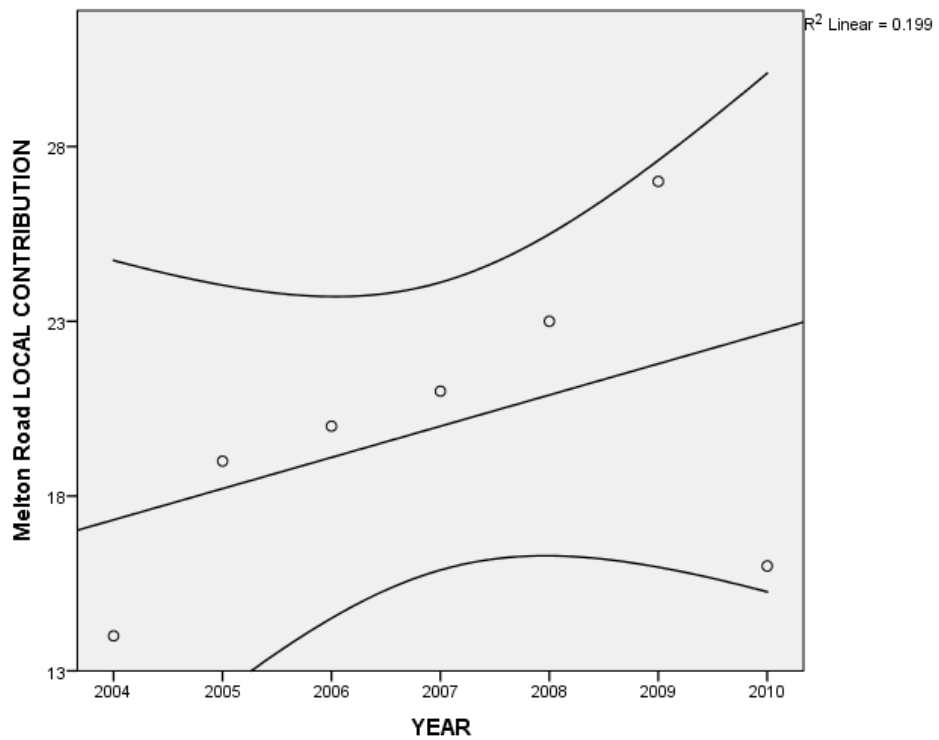
Appendix 10. Figure 27: Leicester Traffic Urban automatic monitoring data 2006-2011 showing London Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



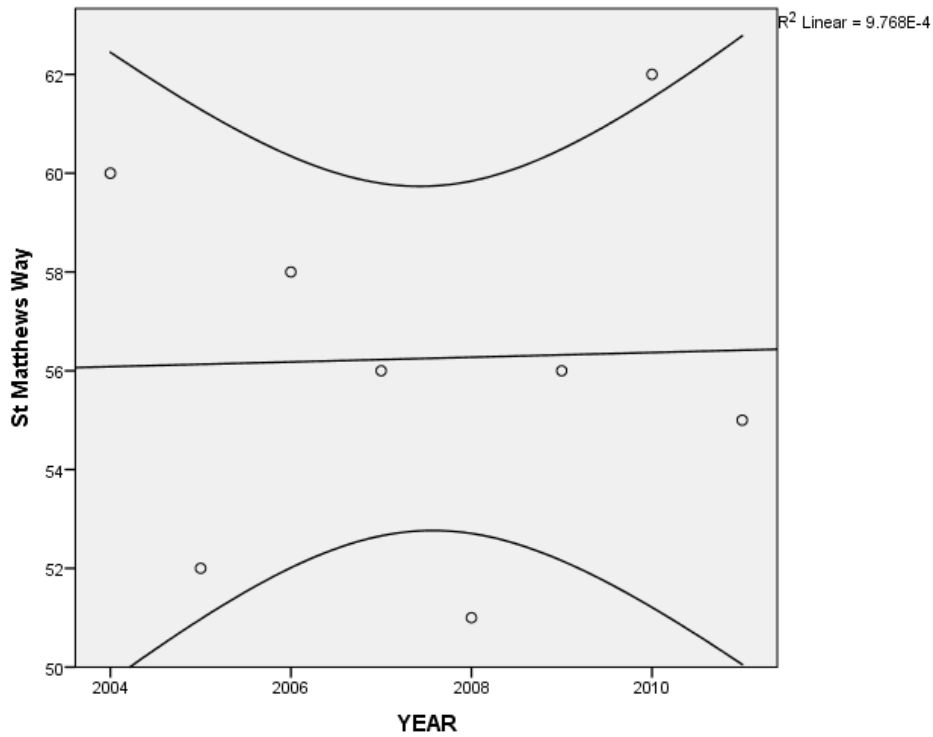
Appendix 10. Figure 28: Calculated Local Contribution NO<sub>2</sub> annual means 2006-2010 for London Road and Leicester Centre showing linear regression line and 95% confidence intervals



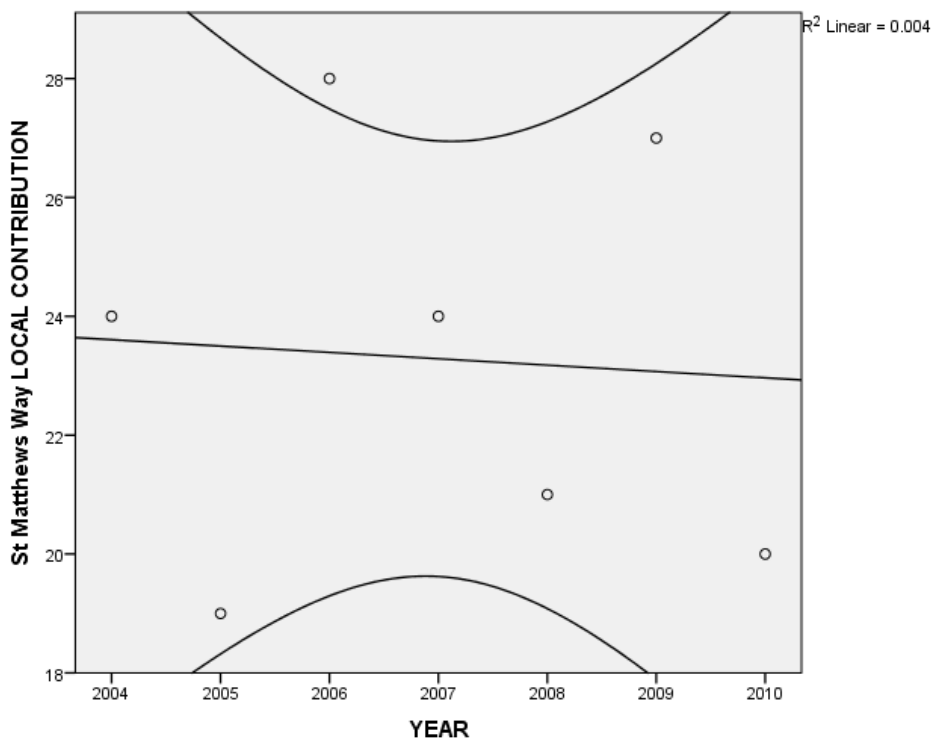
**Appendix 10. Figure 29: Leicester Traffic Urban automatic monitoring data 2004-2011 showing Melton Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



**Appendix 10. Figure 30: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Melton Road and Leicester Centre showing linear regression line and 95% confidence intervals**

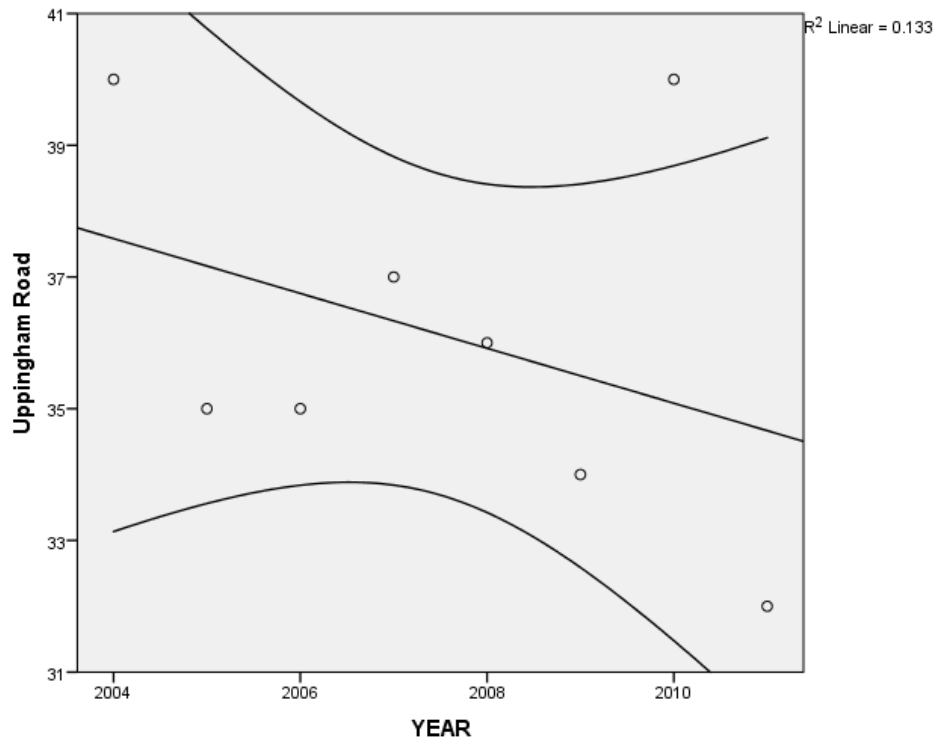


Appendix 10. Figure 31: Leicester Traffic Urban automatic monitoring data 2004-2011 showing St Matthews Way NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals

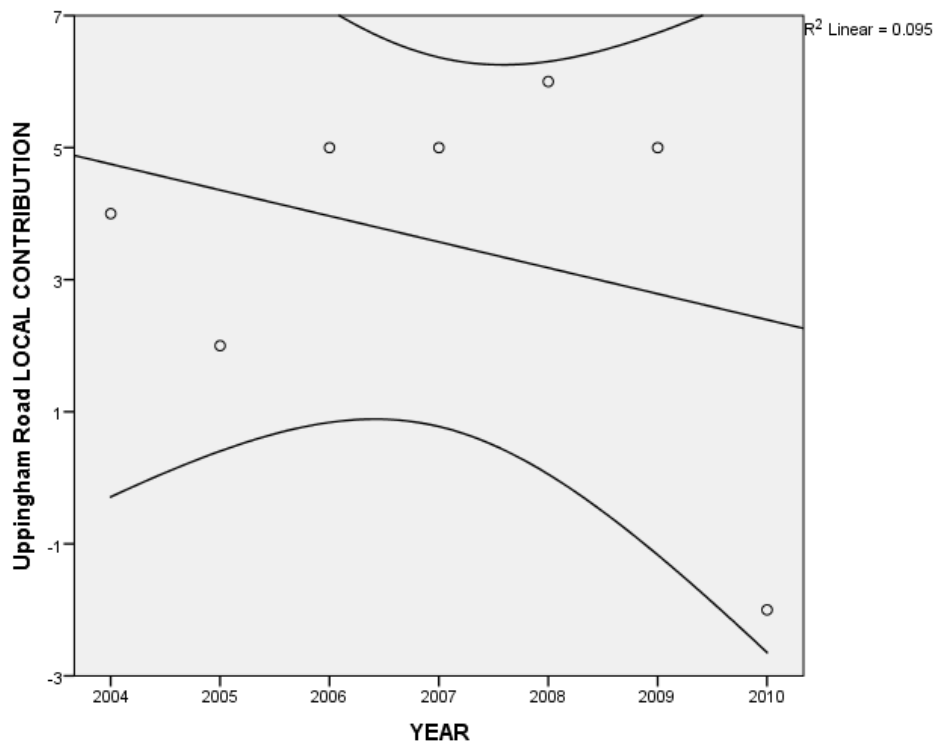


Appendix 10. Figure 32: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for St Matthews Way and Leicester Centre showing linear regression line and 95% confidence intervals

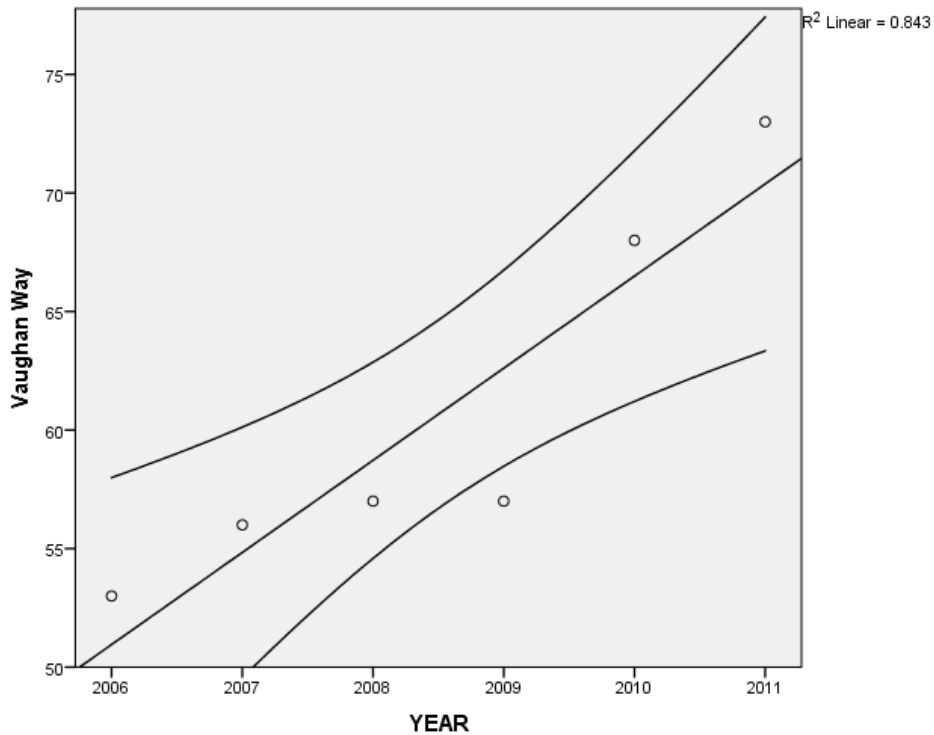




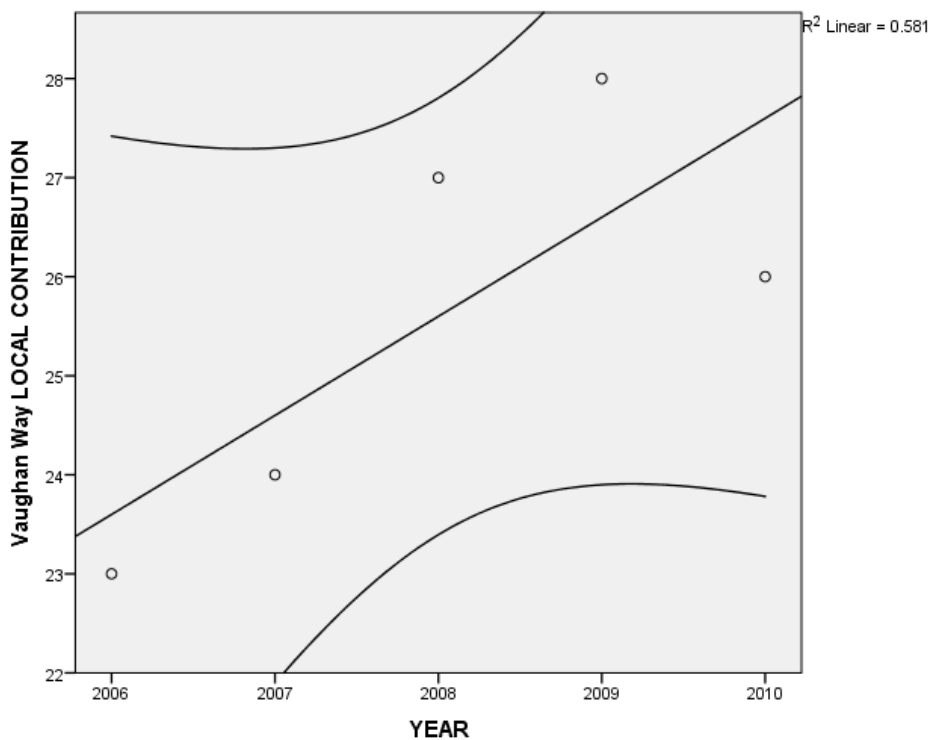
**Appendix 10. Figure 33: Leicester Traffic Urban automatic monitoring data 2004-2011 showing Uppingham Road NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



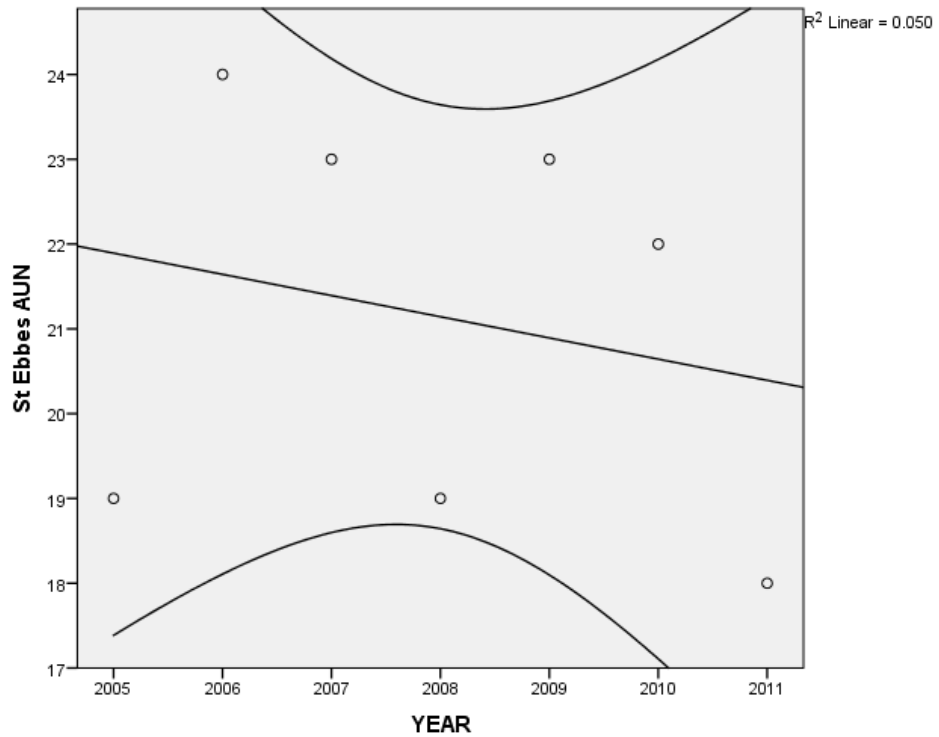
**Appendix 10. Figure 34: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Uppingham Road and Leicester Centre showing linear regression line and 95% confidence intervals**



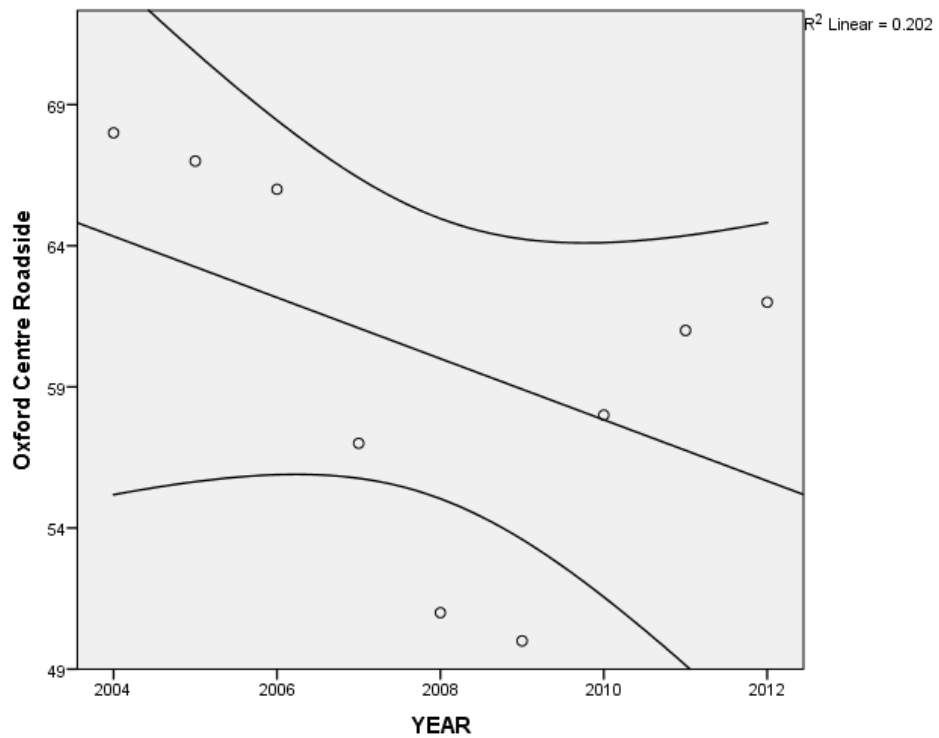
Appendix 10. Figure 35: Leicester Traffic Urban automatic monitoring data 2006-2011 showing Vaughan Way NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



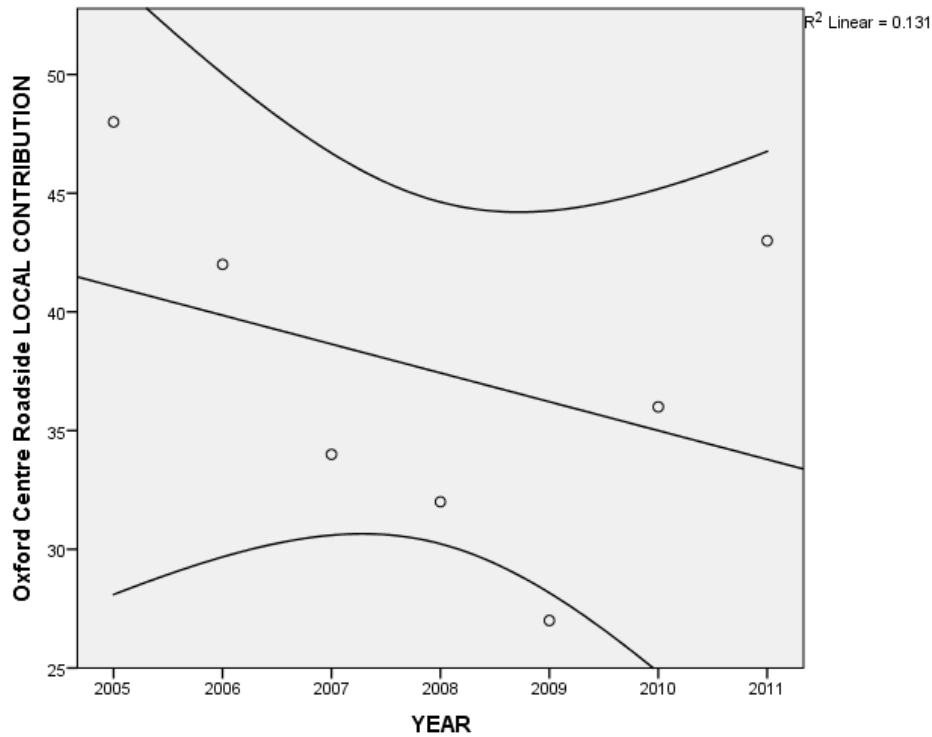
Appendix 10. Figure 36: Calculated Local Contribution NO<sub>2</sub> annual means 2006-2010 for Vaughan Way and Leicester Centre showing linear regression line and 95% confidence intervals



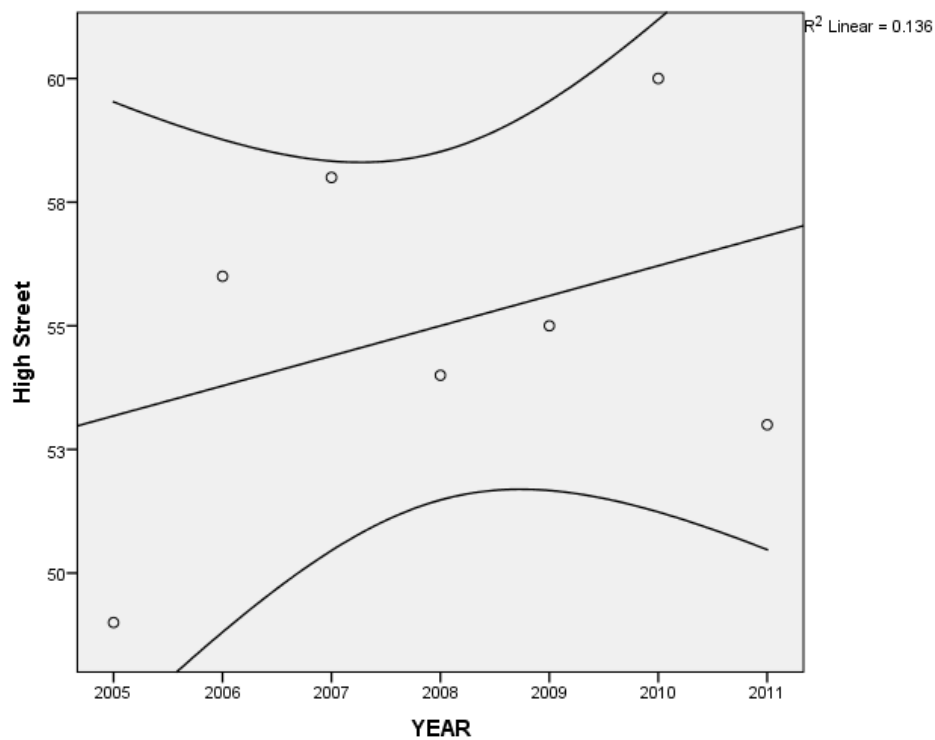
**Appendix 10. Figure 37: Oxford Background Urban automatic monitoring data 2005-2011 showing St Ebbe's AUN NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



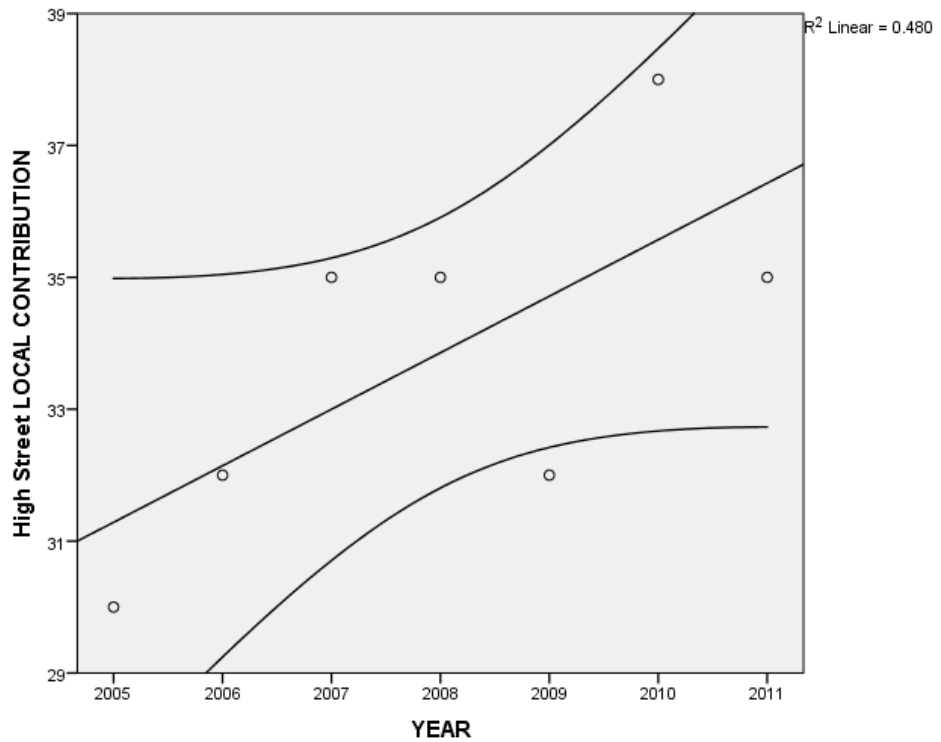
**Appendix 10. Figure 38: Oxford Traffic Urban automatic monitoring data 2004-2012 showing Oxford Centre Roadside NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



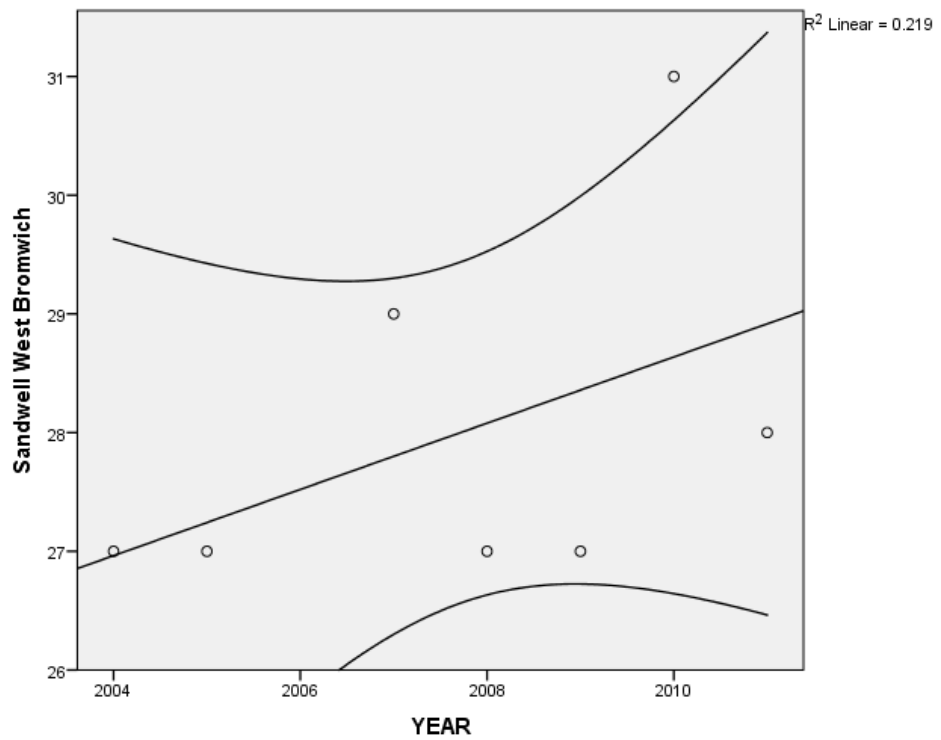
Appendix 10. Figure 39: Calculated Local Contribution NO<sub>2</sub> annual means 2005-2011 for Oxford Centre Roadside and St Ebbe's AUN showing linear regression line and 95% confidence intervals



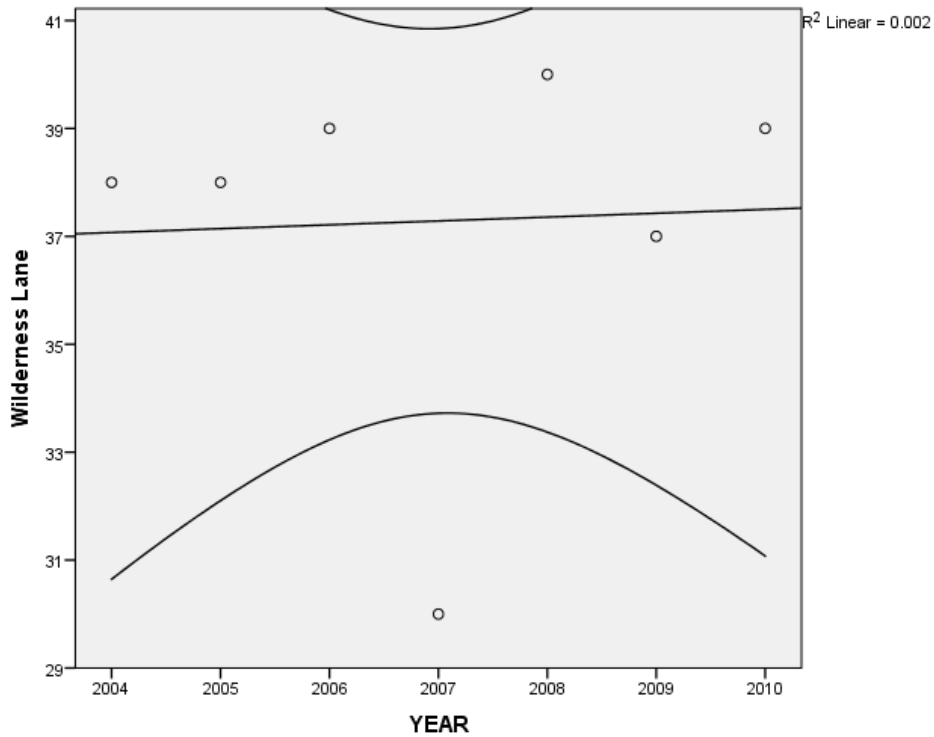
Appendix 10. Figure 40: Oxford Traffic Urban automatic monitoring data 2005-2011 showing High Street NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



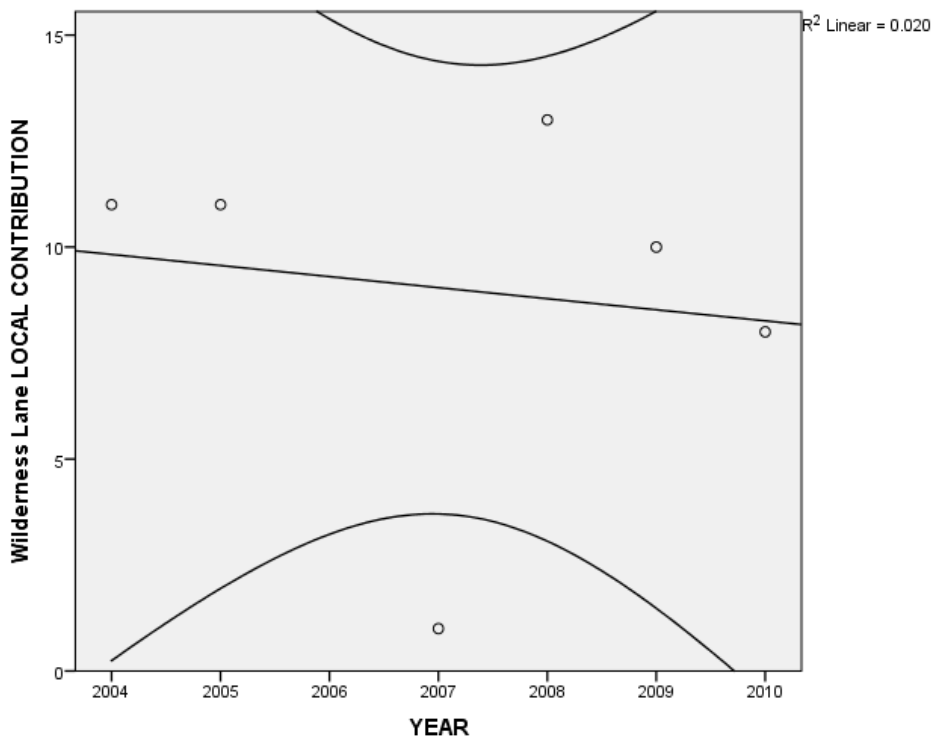
**Appendix 10. Figure 41: Calculated Local Contribution NO<sub>2</sub> annual means 2005-2011 for High Street and St Ebbe's AUN showing linear regression line and 95% confidence intervals**



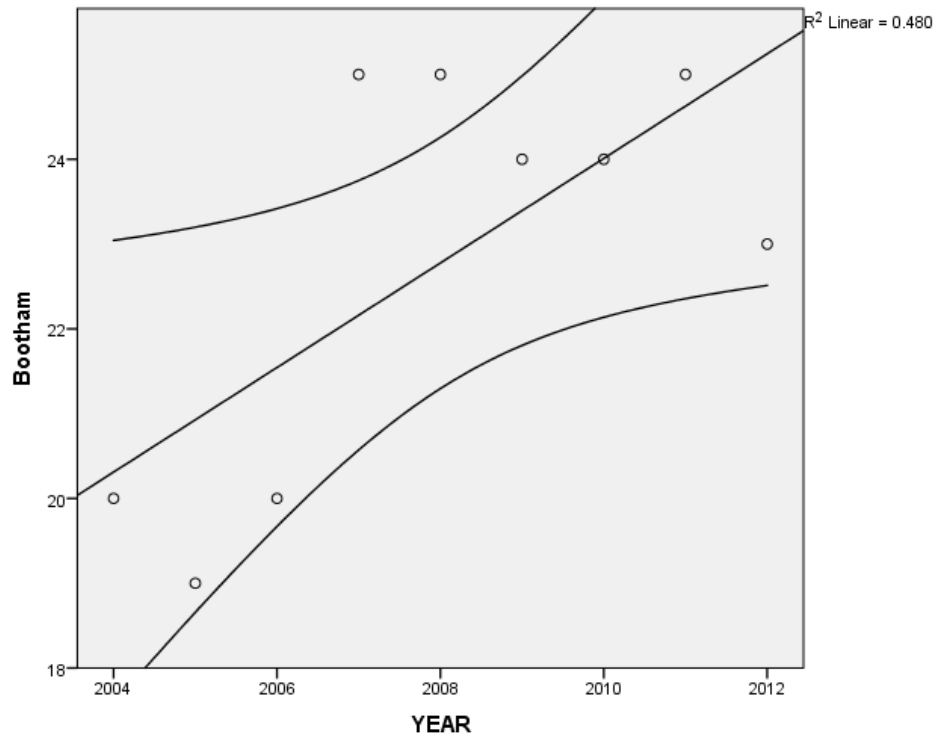
**Appendix 10. Figure 42: Sandwell Background Urban automatic monitoring data 2004-2011 showing Sandwell West Bromwich NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



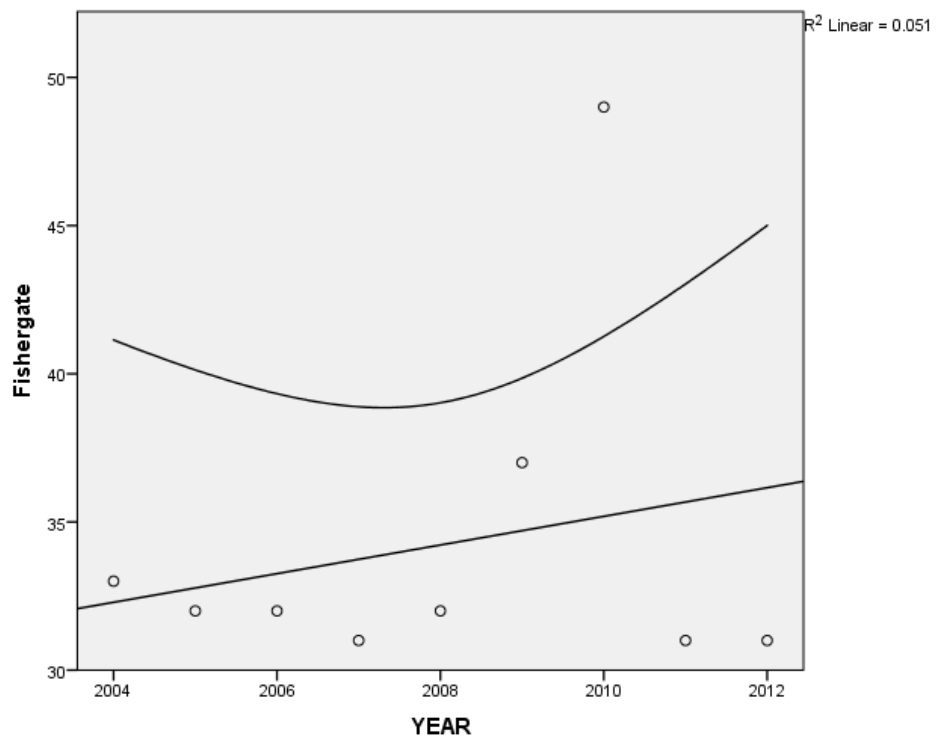
Appendix 10. Figure 43: Sandwell Traffic Urban automatic monitoring data 2004-2010 showing Wilderness Lane NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



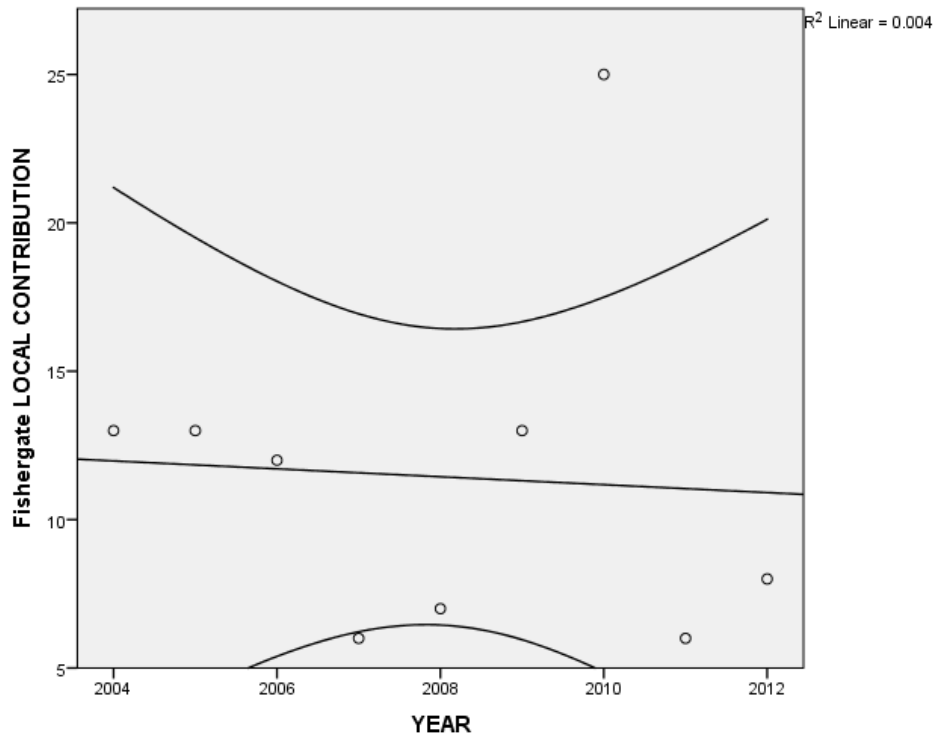
Appendix 10. Figure 44: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2010 for Wilderness Lane and Sandwell West Bromwich showing linear regression line and 95% confidence intervals



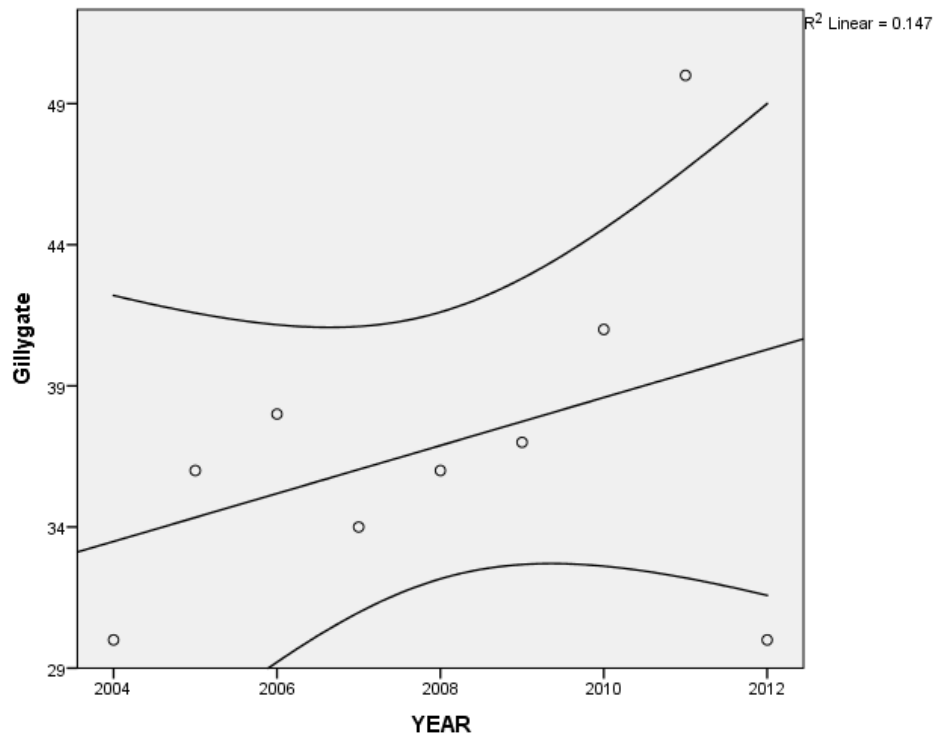
**Appendix 10. Figure 45: York Background Urban automatic monitoring data 2004-2012 showing Bootham NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



**Appendix 10. Figure 46: York Traffic Urban automatic monitoring data 2004-2012 showing Fishergate NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**

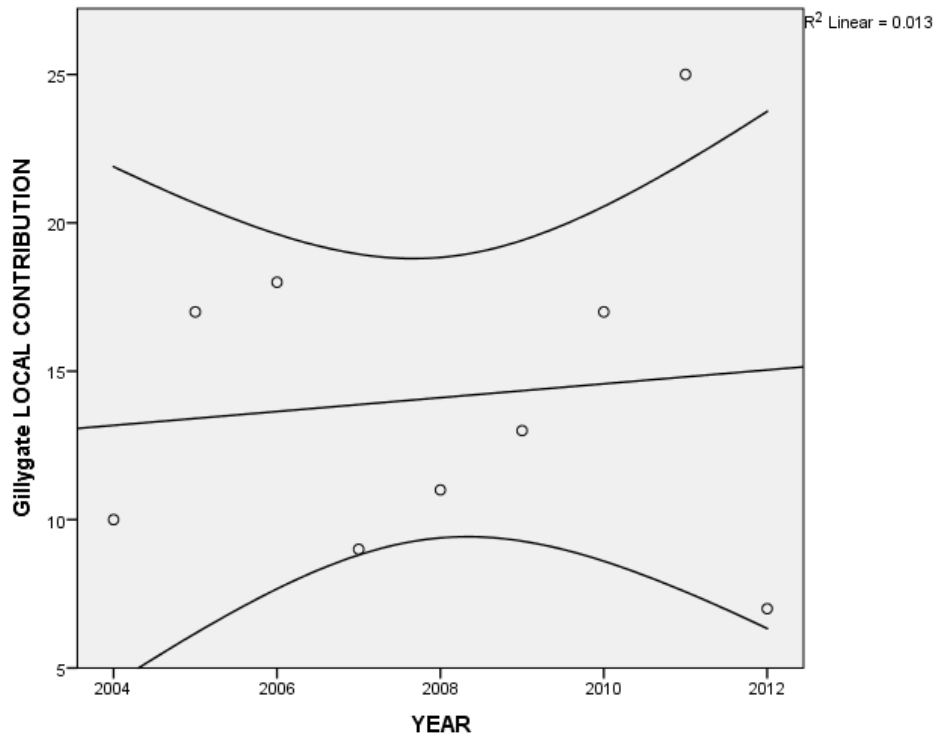


Appendix 10. Figure 47: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Fishergate and Bootham showing linear regression line and 95% confidence intervals

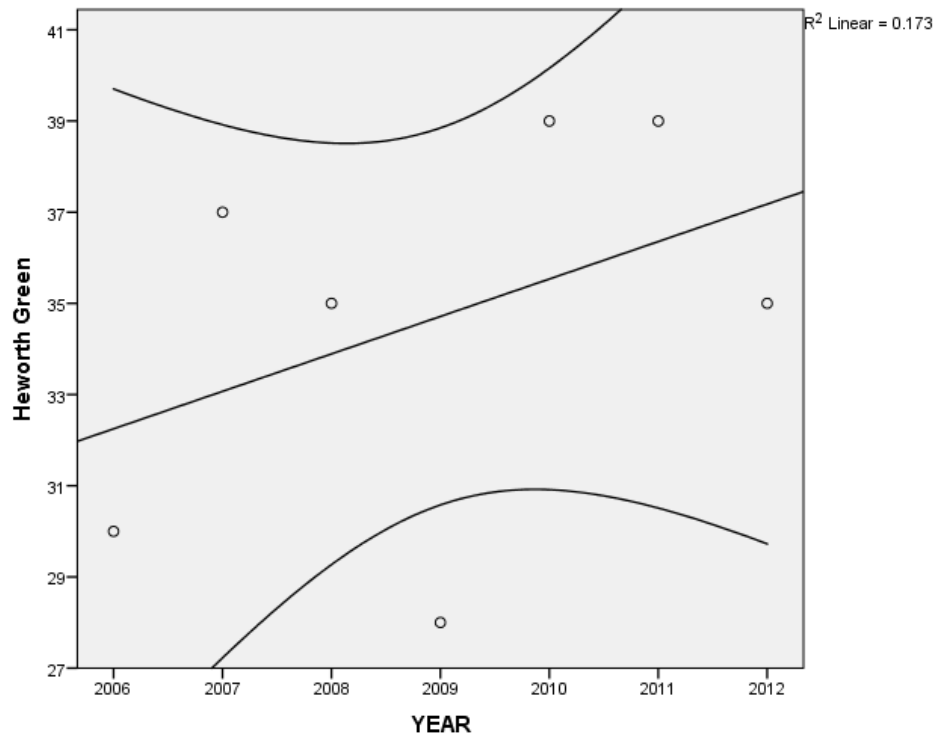


Appendix 10. Figure 48: York Traffic Urban automatic monitoring data 2004-2012 showing Gillygate NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals

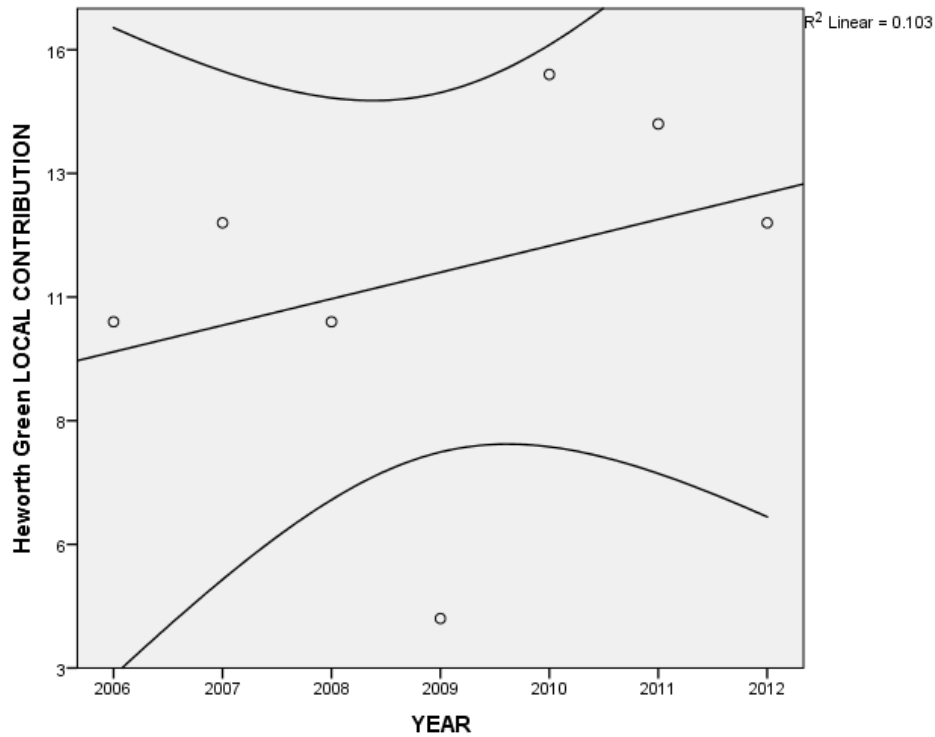




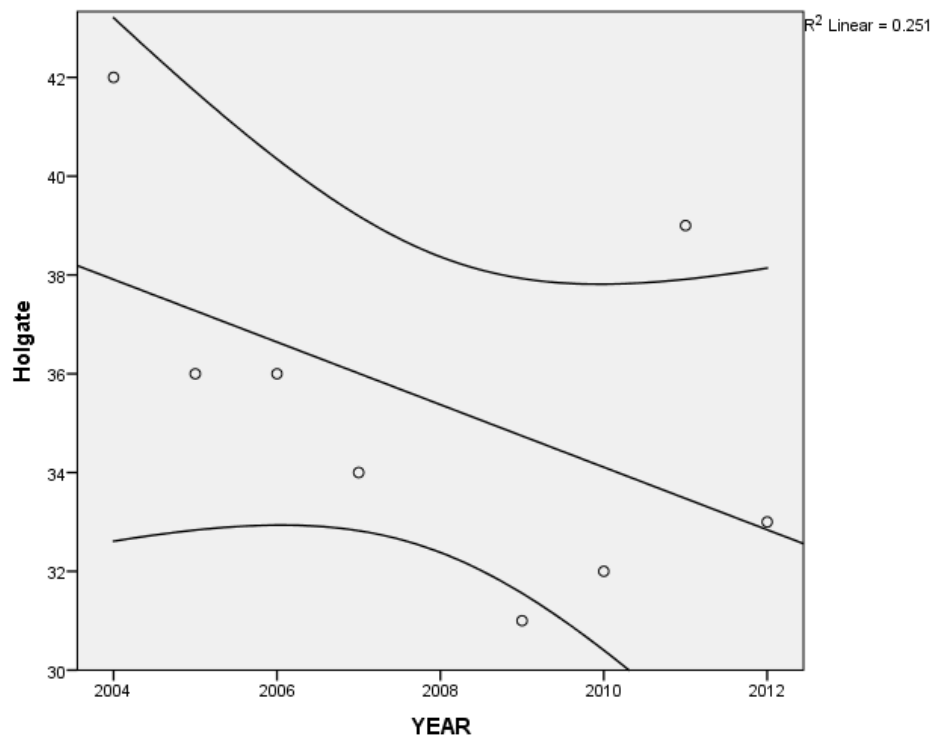
**Appendix 10. Figure 49: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Gillygate and Bootham showing linear regression line and 95% confidence intervals**



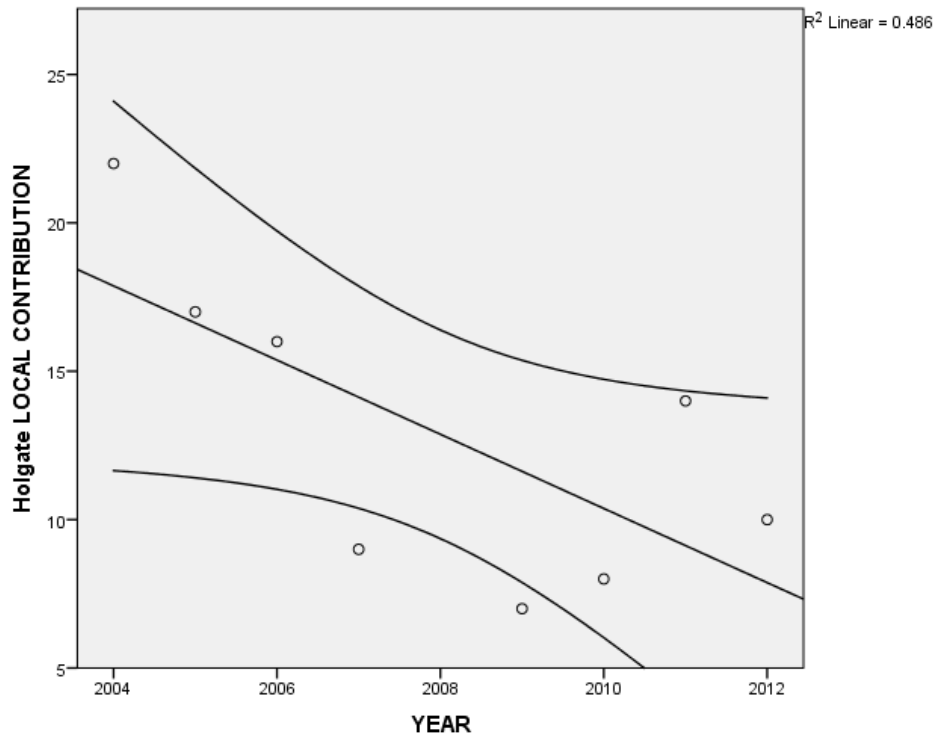
**Appendix 10. Figure 50: York Traffic Urban automatic monitoring data 2006-2012 showing Heworth Green NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



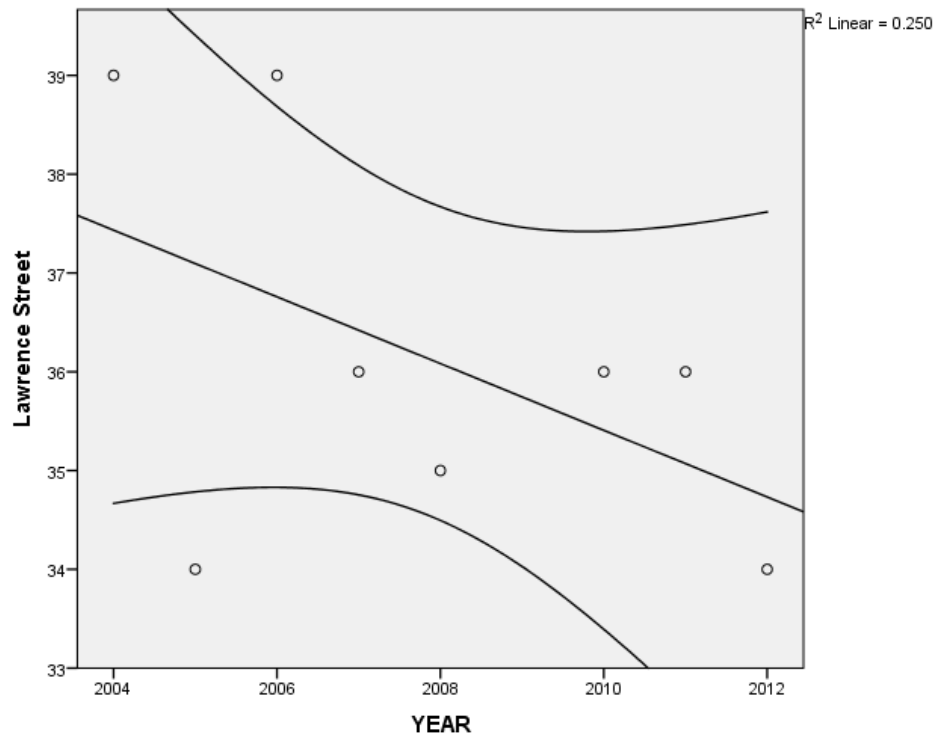
Appendix 10. Figure 51: Calculated Local Contribution NO<sub>2</sub> annual means 2006-2012 for Heworth Green and Bootham showing linear regression line and 95% confidence intervals



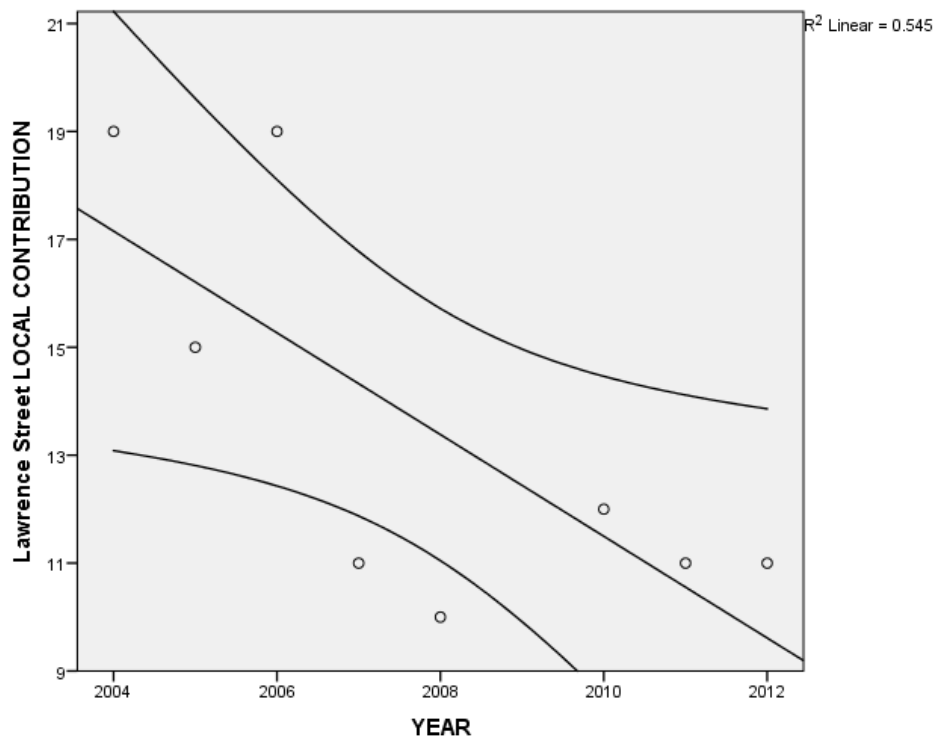
Appendix 10. Figure 52: York Traffic Urban automatic monitoring data 2004-2012 showing Holgate NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



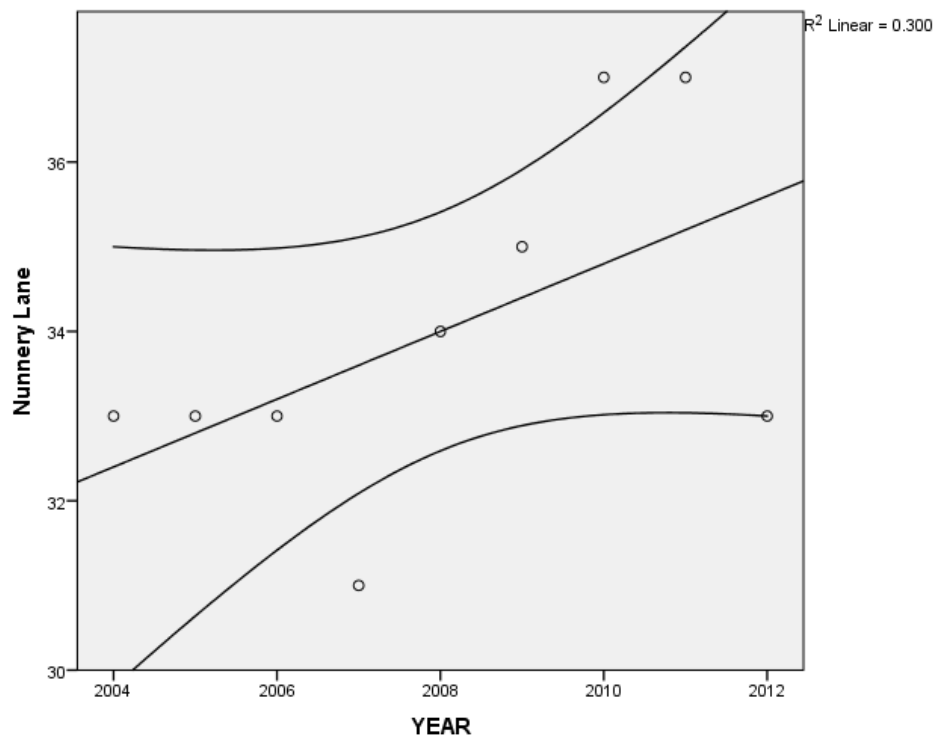
**Appendix 10. Figure 53: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Holgate and Bootham showing linear regression line and 95% confidence intervals**



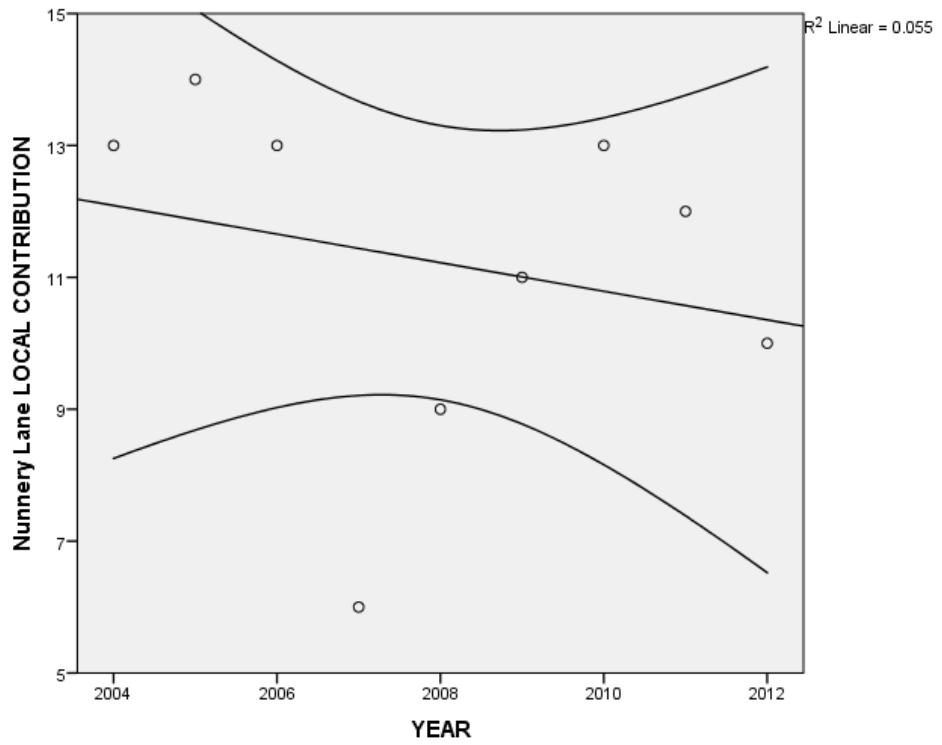
**Appendix 10. Figure 54: York Traffic Urban automatic monitoring data 2004-2012 showing Lawrence Street NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals**



Appendix 10. Figure 55: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Lawrence Street and Bootham showing linear regression line and 95% confidence intervals



Appendix 10. Figure 56: York Traffic Urban automatic monitoring data 2004-2012 showing Nunnery Lane NO<sub>2</sub> annual means, linear regression line and 95% confidence intervals



**Appendix 10. Figure 57: Calculated Local Contribution NO<sub>2</sub> annual means 2004-2012 for Nunnery Lane and Bootham showing linear regression line and 95% confidence intervals**

## Appendix 11: Case study AQAP tables

Appendix 11. Table 1: Barnsley AQAP measures and reported annual progress 2003-2012

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
Related Plans/Policies (existing or proposed)	Measure No.1: BMBC will produce revised policy on pollution, including air pollution, which will be published in the new deposit draft LDF by summer 2004 for consultation .	Measure No.1: BMBC have produced revised policy on pollution, including air pollution, which has been published in the new deposit draft LDF during summer 2004 for consultation.	Revised policy was published in Summer 2004, and is currently out for consultation	Revised policy was published in Summer 2004.	Revised policy was published in Summer 2004.	Revised policy was published in Summer 2004	Revised policy was published in Summer 2004	Revised policy was published in Summer 2004				Completed Summer 2004
	Measure No.2: BMBC will continue to attend and take an active part in the South Yorkshire Integrated Transport Group (Air Quality and Environment)	Measure No.2: BMBC will continue to attend and take an active part in the South Yorkshire Integrated Transport Group (Air Quality and Environment)	Contributed air quality information to the Local Transport Plan Annual Progress Reports	Contribute air quality information to the Local Transport Plan Annual Progress Reports. Formation of South Yorkshire Countywide steering	Integration of South Yorkshire Air Quality Action Plans (AQAPs) into the second South Yorkshire Local Transport Plan (LTP).	The success of the Integrated Transport Group (Air Quality and Environment) is now linked to progress with measure 3. This group	The success of the Integrated Transport Group (Air Quality and Environment) is now linked to progress with measure 3 below. This	The success of the Integrated Transport Group (Air Quality and Environment) is now linked to progress with measure 3 below. This				Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	Sub-group) and its work.	Transport Group (Air Quality and Environment Sub-group) and its work.		group overseeing the alignment of local air quality action plans within the second South Yorkshire Local Transport Plan	Development of closer working links between transportation officers and air quality officers.	is the countywide group which works towards the alignment of the Action Plan with the Local Transport Plan.	group is the countywide group which worked towards the alignment of South Yorkshires' Action Plans with the Local Transport Plan.	Plans with the Local Transport Plan.				
	Measure No.3: BMBC will ensure that this Action Plan is aligned with the LTP.	Measure No.3: BMBC will ensure that this Action Plan is aligned with the LTP.	The recently published Department of Transport guidance into the 2nd round of LTPs highlights incorporation of traffic based air quality action plans into the LTPs	Following competitive tender, air quality consultants appointed to report into aligning air quality action plans within the second Local Transport Plan.	Air Quality is one of the four main shared priorities of the LTP. Integration of AQAPs into the LTP has been the main focus of air quality officers work in South Yorkshire during 2005/06, as this will shape local practice with dealing road	Integration of air quality within the second South Yorkshire Local Transport Plan (LTP2). Production of air quality mandatory indicator, along with trajectory indicator (Indicator LTP8). Funding and undertaking of a study, collating	Integration of air quality within the second South Yorkshire Local Transport Plan (LTP2). Production of air quality mandatory indicator, along with trajectory indicator (Indicator LTP8). Funding and undertaking of a study, collating	Integration of air quality within the second South Yorkshire Local Transport Plan (LTP2). Production of air quality mandatory indicator, along with trajectory indicator (Indicator LTP8) Funding and undertaking of a study, collating and prioritising countywide air quality measures to be implemented in the lifetime of the LTP2				Completed 2005/6

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
					transport based pollution up to 2011.	and prioritising countywide air quality measures to be implemented in the lifetime of the LTP2	and prioritising countywide air quality measures to be implemented in the lifetime of the LTP2.					
Potential Direct Measures to Improve Air Quality within the AQMA	<p>Measure No.4; BMBC will explore the feasibility of the implementation of speed restrictions on the M1 with the Highways Agency by the end of April 2005.</p> <p>Measure No.5: BMBC will explore the feasibility of the use of variable messaging/traffic management schemes with the Highways Agency by the end of April 2005.</p>	Measure No.4: BMBC will liaise with the Highways Agency and encourage their active consideration of measures to reduce emissions from the M1 motorway by the end of April 2005.	Initial communication with the HA	Initial communication with the HA reported in the Interim Air Quality Annual Progress Report. A regional grouping of Local Authorities with motorway based AQMAs was formed to liaise with the Highways Agency during 2004.	Following the SYWMBUS * study, there are proposals for widening of the M1 motorway through the Borough and elsewhere. The Highways Agency are keen to minimise the air quality impact of this proposal and are now intending to draft an Action Plan containing actions to	Following the SYWMBUS * study; there are proposals for widening of the M1 motorway through the Borough and elsewhere. The Highways Agency are keen to minimise the air quality impact of this proposal and are now intending to draft an Action Plan containing actions to	Barnsley MBC and the Highways Agency are currently exploring the feasibility to develop two areas wide travel plans adjacent to the M1 motorway AQMA, near to junction 36 and 37 within the Borough. The aim of these two proposed travel plans is to reduce congestion and improve accessibilit					Ongoing



	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
					ensure that the air quality objectives are met.	ensure that the air quality objectives are met. * South and West Yorkshire Motorway Best Use Study	y in these areas, with a hoped for "spin off" in reduction in air pollution concentrations at these locations.					
	Measure No.6: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07	Measure No.5: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07	Planning permission obtained. Consultation and objection period ongoing	Work on the by-pass now commenced	Work on the by-pass continuing	Phased completion June – September 2006	By-pass completed September 2006	By-pass completed September 2006				Completed September 2006
Reduce Pollution from	Measure No.7: BMBC will continue to work with developers and employers to improve sustainable transport	Measure No.6: BMBC will continue to work with developers and employers to	Local Authority developing procedures to roll out travel plans in the Public and Private sectors	Local Authority developing procedures to roll out travel plans in the Public and Private sectors	Local Authority developing procedures to roll out travel plans in the Public and Private sectors.	Local Authority developing procedures to roll out travel plans in the Public and Private sectors.	Local Authority developing procedures to roll out travel plans in the Public and Private sectors.	Local Authority developing procedures to roll out travel plans in the Public and Private sectors.	Over 95% of the Borough's schools now have school travel plans, whilst the number of voluntary and conditioned business related travel plans continues to grow. It is important that	Ongoing	Ongoing	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	links to new economic and residential developments.	improve sustainable transport links to new economic and residential developments.							this work continues.			
	Measure No.8: BMBC will take part in the South Yorkshire Vehicle Emissions Testing Partnership in order to raise awareness of pollution from vehicles.	Measure No.7: BMBC has taken part in the South Yorkshire Vehicle Emissions Testing Partnership in order to raise awareness of pollution from vehicles.	Campaign ran from May 2003 to March 2004 (The South Yorkshire Vehicle Emission Testing Partnership – SYVET)	Campaign ran from May 2003 to March 2004 (The South Yorkshire Vehicle Emission Testing Partnership – SYVET)	Completed – will not be reported in future APRs unless such campaigns are run as part of LTP air quality measures.	n/a	A further Countywide vehicle emission testing (VET) project was undertaken in 2007, with the purpose to identify those groups of vehicles which are considered to be the most polluting. The results of the survey may also develop South Yorkshire based emission factors	A further Countywide vehicle emission testing (VET) project was undertaken in 2007, with further testing being undertaken in 2008. The purpose of the testing was to identify those groups of vehicles which are considered to be the most polluting. The results of the survey may also develop South Yorkshire based emission factors				Completed

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	Measure No.9: As part of the SYVET project, BMBC will carry out 3 days formal emissions testing and 3 days informal emissions testing within the borough by the end of December 2003.	Measure No.8: As part of the SYVET project, BMBC have undertaken 3 days formal emissions testing and 3 days informal emissions testing within the borough. This work was completed during 2003.	Campaign ran from May 2003 to March 2004 (The South Yorkshire Vehicle Emission Testing Partnership – SYVET). Formal and voluntary testing programmes	Campaign ran from May 2003 to March 2004 (The South Yorkshire Vehicle Emission Testing Partnership – SYVET). Formal and voluntary testing programmes	Completed – will not be reported in future APRs unless such campaigns are run as part of LTP air quality measures.	n/a	n/a	n/a				Completed
	Measure No.10: BMBC will continue to provide the Smoky Diesel Hotline Service on telephone number 01226 772458	Measure No.9: BMBC will continue to provide the Smoky Diesel Hotline Service on telephone number 01226	Barnsley MBC continues to provide the Smoky Diesel Hotline Service	Barnsley MBC continues to provide the Smoky Diesel Hotline Service	Barnsley MBC continues to provide the Smoky Diesel Hotline Service.	Barnsley MBC continues to provide the Smoky Diesel Hotline Service	Barnsley MBC continues to provide the Smoky Diesel Hotline Service	Barnsley MBC continues to provide the Smoky Diesel Hotline Service	Since 2000, there have been 20 referrals to the smoky diesel hotline. This may not seem a significant number, but as this service is not resource intensive, this service will remain available.	Ongoing	Re-launched in 2010 and given higher priority on Barnsley MBC air quality website	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
		772458										
		Measure no. 25 – BMBC will explore methods of encouraging the uptake of alternative fuels within the Borough by the end of April 2006.	New measure proposed within the post consultation Air Quality Action Plan	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure.	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure.	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure	Encourage uptake of lower emission vehicles and alternative fuels by participating in the LTP funded South Yorkshire “Low carbon re-fuelling infrastructure” project	Production of countywide delivery plan document	An LSTF bid (decision due Summer 2012) includes potential funding for the use of electric vehicles in the Borough and sub region. In addition, there has been sub regional preparatory work in developing a regional electric	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
		Measure no. 26 – BMBC will explore methods of encouraging the conversion of older vehicle types to clean alternatives by the end of April 2006.	New measure proposed within the post consultation Air Quality Action Plan	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure.	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure.	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure.	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital	New measure proposed within the post consultation Air Quality Action Plan. Supported Capital Expenditure Bid submitted to DEFRA for proposal for consultants to report into the feasibility of this measure			charging infrastructure.	
Targeting of Monitoring within the AQMA and across the Borough	Measure No.11: BMBC will carry out further NO2 diffusion tube monitoring, including co-location, within the AQMA and surrounding area by the end of April 2004.	Measure No.10: BMBC have undertaken further NO2 diffusion tube monitoring, including co-location, within the AQMA	Results published in Barnsley MBC Detailed Assessment	Results published in Barnsley MBC Detailed Assessment and in this report	Results published in Barnsley MBC Updating and Screening Assessment, April 2006.	Bias adjusted diffusion tube data for 2006 continues to show exceedence of the annual average objective for NO2 at locations within the AQMA	Bias adjusted diffusion tube data for 2007 continues to show exceedence of the annual average objective for NO2 at locations within the M1 motorway	Bias adjusted diffusion tube data for 2008 continues to show exceedence of the annual average objective for NO2 at locations within the M1 motorway AQMA	Countywide Monitoring	Ongoing	Ongoing	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
		and surrounding area, up to and beyond the end of April 2004. The data from this monitoring are reported in this Plan.					AQMA.					
	Measure No.12: BMBC will continue to locate a real time NO2 monitor within the AQMA until the end of April 2004.	Measure No.11: BMBC have located a real time NO2 monitor adjacent to the AQMA, and data from this monitoring are reported in this Plan.	Results published in Barnsley MBC Detailed Assessment	Results published in Barnsley MBC Detailed Assessment and in this report	Results published in Barnsley MBC Updating and Screening Assessment, April 2006.	Results published in Barnsley MBC Updating and Screening Assessment, April 2007	Results published in Barnsley MBC Annual Progress Report 2008	Results published in Barnsley MBC Annual Progress Report 2008				

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	Measure No.13: BMBC will continue to expand and update its air pollution modelling capability	Measure No.12: BMBC will continue to expand and update its air pollution modelling capability	The road database was suitably updated for the Detailed Assessment. The database is currently being updated to enable modelling of PM10 concentrations at Junction 37 of the M1 motorway. Supported Capital Expenditure Bid submitted to DEFRA to further improve and upgrade modelling capability.	The road database was suitably updated for the Detailed Assessment. The database is currently being updated to enable modelling of PM10 concentrations at Junction 37 of the M1 motorway. Supported Capital Expenditure Bid submitted to DEFRA to further improve and upgrade modelling capability.	The Barnsley MBC Airviro modelling system has recently been updated to enable future modelling to undertaken as part of a Local Public Service Agreement in Barnsley relating to congestion and air quality on locally administered roads.	The Barnsley MBC Airviro modelling system has recently been updated to enable future modelling to undertaken as part of a Local Public Service Agreement in Barnsley relating to congestion and air quality on locally administered roads.	The Barnsley MBC modelling system will be shortly updated to an internet version (Airviro), which will then mirror capability within other South Yorkshire local authorities. In addition, there will be further development of the Countywide emissions database.	The Barnsley MBC Airviro modelling system has been updated to an internet version (Airviro), this mirrors capability within other South Yorkshire local authorities. In addition, there has been further development of the Countywide emissions database.	Countywide Modelling and EDB	Ongoing	Completion of output of the Barnsley SATURN traffic model into Airviro format for base year, along with 2012, 2015 and 2020. Further work on evaluating bus emissions in the Borough is currently being undertaken	Ongoing
	Measure No.14: BMBC will produce a written monitoring strategy for the borough by the end	Measure No.13: BMBC will produce a written monitoring strategy	This work will be completed within the designated timescale.	This work will be completed within the designated timescale.	This work will be completed within the designated timescale.	This work will be completed within the designated timescale.	This work has yet to be undertaken ; however the monitoring regime is under	This work has yet to be undertaken; however the monitoring regime is under constant review.				Not completed

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	of December 2005.	for the borough by the end of December 2005.					constant review.					
General Measures to Reduce Emissions from Industrial and Domestic Sources	Measure No.15: BMBC will continue to provide comprehensive control over emissions from Part B and A2 processes, and act as consultees to the Environment Agency for part A1 processes.	Measure No.14: BMBC will continue to provide comprehensive control over emissions from Part B and A2 processes, and act as consultees to the Environment Agency for part A1 processes.	Barnsley MBC continues to undertake its LAPC and IPPC commitments	Barnsley MBC continues to undertake its LAPC and IPPC commitments	Barnsley MBC continues to undertake its LAPC and IPPC commitments.	Barnsley MBC continues to undertake its LAPC and IPPC commitments	Barnsley MBC continues to undertake its LAPC and IPPC commitments	Barnsley MBC continues to undertake its LAPC and IPPC commitments	Continuing regulation of PPC related process has minimised emissions to air from these processes. This has and will continue to have a positive impact on the quality of the air generally in the Borough.	Ongoing	Ongoing	Ongoing
	Measure No.16: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards	Measure No.15: BMBC will continue to enforce the provision	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial	Barnsley MBC continues to enforce the Clean Air Act 1993, with respect to industrial smoke.	Continuing regulation of non PPC related process has minimised emissions to air from these processes. This has and will	Ongoing	Ongoing	Ongoing



	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	to industrial smoke.	s of the Clean Air Act 1993 with regards to industrial smoke.	smoke	smoke	smoke.	smoke.	smoke.		continue to have a positive impact on the quality of the air generally in the Borough.			
	Measure No.17: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to domestic smoke control, and will implement a publicity campaign to raise awareness of the issue throughout the borough by the end of December 2005.	Measure No.16: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to domestic smoke control, and will implement a publicity campaign to raise awareness of the issue throughout the borough by the end of December 2005.	To be implemented by December 2005	To be implemented by December 2005	To be implemented by December 2005.	To be implemented by December 2005. Scrutiny of the number of smoking chimney complaints received recently by this Service indicates that such a campaign is currently not justified. This Service will however continue to be proactive in policing the Borough, and will investigate complaints as required by our Service Plan. This	Not included	Not included	Continuing regulation of domestic emissions to air has and will continue to have a positive impact on the quality of the air generally in the Borough	Ongoing	Ongoing	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
						measure will not be reported in future annual progress reports						
	Measure No.18: BMBC will continue to investigate complaints about nuisance, and take appropriate action to resolve the problem.	Measure No.17: BMBC will continue to investigate complaints about nuisance, and take appropriate action to resolve the problem.	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Barnsley MBC continues to investigate air pollution nuisance complaints, and enforce where appropriate	Resolving of nuisance issues will continue to have a positive impact on the quality of the air generally in the Borough.	Ongoing	Ongoing	Ongoing
	Measure No.19: BMBC will continue to encourage composting of waste rather than burning, by publicity and the provision of discounted cost composting	Measure No.18: BMBC will continue to encourage composting of waste rather than burning, by	Barnsley MBC continues to encourage the composting of waste, as an alternative to uncontrolled burning	Barnsley MBC continues to encourage the composting of waste, as an alternative to uncontrolled burning	Barnsley MBC continues to encourage the composting of waste, as an alternative to uncontrolled burning.	Barnsley MBC continues to encourage the composting of waste, as an alternative to uncontrolled burning. As part of an	Not included	Not included				Ongoing, but no longer reported

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	units.	publicity and the provision of discounted composting units.				alternate weekly refuse collection pilot, green garden waste and cardboard is collected from 26,000 properties. This scheme commenced April 2005 and pending the results of a comprehensive evaluation it is hoped to expand the scheme to further properties. This measure will not be reported in future annual progress reports						

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	Measure No.20: BMBC will investigate the feasibility of continuing with home insulation schemes, and will continue to work in partnership with the South Yorkshire Energy Efficiency Advice Centre.	Measure No.19: BMBC will investigate the feasibility of continuing with home insulation schemes, and will continue to work in partnership with the South Yorkshire Energy Efficiency Advice Centre.	South Yorkshire Energy Advice Centre (SYEEAC) provide advice and some financial assistance to Barnsley residents	BMBC continues to work in partnership with the South Yorkshire Energy Advice Centre (SYEEAC) and Npower to provide advice and some financial assistance to Private Barnsley residents. The Decent Homes programme is providing Social Housing with enhanced energy efficient heating and insulation measures.	BMBC continues to work in partnership with the South Yorkshire Energy Advice Centre (SYEEAC) and Npower to provide advice and some financial assistance to Private Barnsley residents. The Decent Homes programme is providing Social Housing with enhanced energy efficient heating and insulation measures. In addition, SYEEAC works with the Warm Front Team as part of this	BMBC continues to work in partnership with the South Yorkshire Energy Advice Centre (SYEAC) and Npower to provide advice and some financial assistance to Private Barnsley residents. The Decent Homes programme is providing Social Housing with enhanced energy efficient heating and insulation measures. In addition, SYEAC works with the Warm Front Team as part of this	Not included	Not included				Ongoing, but no longer reported

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
					Government initiative.	Government initiative. This measure will not be reported in future annual progress reports						
Development Control and Future Developments	Measure No.21: BMBC will continue to ensure that air quality is considered with regards to new development, where appropriate, in line with PPG23. The Council will look for evidence that developers have taken appropriate steps to mitigate pollution impacts.	Measure No.20: BMBC will continue to ensure that air quality is considered with regards to new development, where appropriate, in line with PPG23. The Council will look for evidence that developers have taken appropriate steps to mitigate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Liaison with Development Control planners has enabled procedures to be developed for air quality to be considered, when appropriate	Since 2004, where appropriate, planning applications have been assessed for their air quality impact. When needed, suitable mitigation has been required from the developers. It is important that this work continues.	Ongoing	Ongoing	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
		pollution impacts.										
	Measure No.22: BMBC will produce Supplementary Planning Guidance for developers as to when an air quality assessment may be required, and what information may be needed, by the end of December 2004.	Measure No.21: BMBC will produce Supplementary Planning Guidance for developers as to when an air quality assessment may be required, and what information may be needed, by the end of December 2004.	Awaiting NSCA guidance on Development Control and Air Quality as this will influence drafting of SPG	Subsequent to publication of NSCA guidance on Development Control and Air Quality. No progress to date	Subsequent to publication of NSCA guidance on Development Control and Air Quality. No progress to date.	Subsequent to publication of NSCA guidance on Development Control and Air Quality. No progress to date	Subsequent to publication of NSCA guidance on Development Control and Air Quality. Guidance is currently being drafted, and will be completed around other work areas / projects	Subsequent to publication of NSCA guidance on Development Control and Air Quality, and other documents, Barnsley MBC will not be producing their own local SPG, as this issue is now adequately covered by other guidance that also provide national consistency. It is noted that Environmental Protection UK (formerly NSCA) will be producing an updated version of their guidance.				Not completed

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
	Measure No.23: BMBC will produce Supplementary Planning Guidance as to acceptable development within the AQMA, and requirements on developers by the end of December 2004.	Measure No.22: BMBC will produce Supplementary Planning Guidance as to acceptable development within the AQMA, and requirements on developers by the end of December 2004.	Awaiting NSCA guidance on Development Control and Air Quality as this will influence drafting of SPG	Subsequent to publication of NSCA guidance on Development Control and Air Quality . No progress to date	Subsequent to publication of NSCA guidance on Development Control and Air Quality . No progress to date.	Subsequent to publication of NSCA guidance on Development Control and Air Quality. No progress to date	2008 Subsequent to publication of NSCA guidance on Development Control and Air Quality. No progress to date	Subsequent to publication of NSCA guidance on Development Control and Air Quality, and other documents, Barnsley MBC will not be producing their own local SPG, as this issue is now adequately covered by other guidance that also provide national consistency. It is noted that Environmental Protection UK (formerly NSCA) will be producing an updated version of their guidance.				Not completed
	Measure No.24: BMBC will ensure that all major traffic schemes are assessed for air quality impacts against the NAQS objectives.	Measure No.23: BMBC will ensure that all major traffic schemes are assessed for air quality impacts against the NAQS objective	This work is ongoing	This work is ongoing	This work is ongoing.	This work is ongoing	This work is ongoing	This work is ongoing	Since 2004, all major traffic schemes have been assessed for their air quality impacts. It is important that this work continues.	Ongoing	Ongoing	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
		s.										
General Measures to Promote Air Quality Issues	Measure No.25: BMBC will produce a web site for the provision of air quality information, by the end of December 2004.	Measure No.24: BMBC will produce a web site for the provision of air quality information, by the end of December 2004.	On course to be operational by December 2004. Website will display near real time air quality bulletins, with associated air quality information	Due to technical problems with the feed of data to the air quality website and the redevelopment of the Barnsley MBC website, this has been postponed until Summer 2005	The website has been operational since Summer 2005.	The website has been operational since Summer 2005	The website has been operational since Summer 2005. No major development has occurred in the last 12 months	The website has been operational since Summer 2005. No major development has occurred in the last 12 months				Completed Summer 2005
Additional measures introduced in 2010 AQAP									Construction of Burton Road Quality Bus Corridor (AQMA No. 3)	Work started onsite November 2010	The scheme has been progressively introduced, and was part operational in March 2012	Ongoing
									Barnsley Statutory Quality Partnership Scheme (Bus Partnership)	Scheme implemented Summer 2010. Operators required to inform of any bus misallocation (e.g. a	Scheme implemented Summer 2010. Quarterly meetings with all bus operators, the	Completed Summer 2010



	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
										EURO I spec bus has been placed on a EURO II required journey) SYPTE also undertake independent monitoring of operators	passenger transport executive to gauge progress. Operators required to inform of any bus misallocation (e.g. a EURO I spec bus has been placed on a EURO II required journey)	
									Barnsley Intelligent Transport System	Ongoing	Operation of MOVA and SCOOT at the important A628 Dodworth Road / Summer Lane / Broadway junction (AQMA 2A) has been altered following experience gained using both these systems. Reassess	Completed

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
											ment of operation of these systems has resulted in MOVA operating at off-peak, whilst SCOOT operates on the more busy periods	
									Care4Air	Ongoing	Care4Air resurrecte d using South Yorkshire Local Transport Plan funding, led by Doncaster MBC on behalf of the four South Yorkshire local authorities (including Barnsley MBC). This involves production of the Care4Air conference and a	Completed

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
											major refresh of the Care4Air website	
									Alteration of location of traffic lights (AQMA No. 5)	FA completed, showing potential emission reduction	There has been no progress with this proposed measure during the last 12 months, as a suitable budget has not been identified. Furthermor e, a chart showing recent years' annual mean NO2 concentrati ons in AQMAs 5 are found in appendix one. reveals that the objective was met in 2011. Funding is also being sought, which subject to	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
											securing, will result in a MOVA intelligent traffic management system upgrade being applied to this junction, which should assist with reducing congestion and hence emissions.	
									Implementation of cycling and walking routes adjacent or in AQMAs	Awaiting information	The development of a major Local Sustainable Transport Fund (LSTF) bid for areas of Barnsley Borough has been submitted as part of regional bid. If successful, this would provide significant additional	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
											funding to improve cycle connectivity from parts of the Borough to Barnsley town centre	
									Low Emission Strategy Package	No progress	No progress	Ongoing
									Park and Ride Schemes	No progress, although BMBC retains Capitol Park	No progress, although BMBC retains Capitol Park	Ongoing
									Barnsley MBC Travel Plans (general)	Awaiting information	A number of business related travel plans have submitted as part of planning requirements.	Ongoing
									ECO Stars HDV Recognition Scheme	In the last 12 months ECO Stars has grown from 19 to 30 members, representing an increase of 403 vehicles	In the last 12 months ECO Stars has grown from 30 to 40 members, representing an increase of 345 vehicles	Ongoing

	AQAP draft July2003	AQAP1 Oct2004	AQAP PR Oct2004	AQAP PR April2005	AQAP PR April2006	AQAP PR April2007	AQAP PR April2008	AQAP PR May2009	AQAP3 consultation draft 2010	AQAP PR May2011	AQAP PR May2012	Overall progress
										during the year. The scheme has also been extended in Mid Devon and has been subject to an Intelligent Energy Europe funding bid, which will provide a funding stream until 31.05.14	during the year. The scheme has also been extended in Mid Devon, Gedling, and Edinburgh and has been subject to an Intelligent Energy Europe funding bid, which will provide a funding stream until 31.05.14. Additional interest has also been expressed from other local authorities.	
									Targeted Vehicle Emission Testing	None, discussion on funding***prioritisation within LTP3	No funding identified and currently not a priority of the South Yorkshire LTP	Not completed

Appendix 11. Table 2: Bristol AQAP measures and reported annual progress 2004-2013

		AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7-2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progresses
Information and Promotion	LTP+	1 Information & Awareness Initiatives	Work has commenced on information and awareness initiatives. Implement sustained programme of education initiatives over life of AQAP aimed at encouraging behavioural change. Expand and broaden range of awareness initiatives.	TRAVEL AWARENESS (INC. NEIGHBOURHOOD TRANSPORT INITIATIVES): On-going travel awareness activities, events and campaigns including 'Don't Choke Bristol' and support to 'Streets Alive', Mapping info, Neighbourhood Transport Initiatives and Network.	Don't Choke Bristol' campaign run for second year wide distribution through local employers, schools and other outlets. Travel Information stalls provided at 4 major city events such as the Harbourside Festival, using the new 'i bus'. these events attracted over 100,000 people, resulting in heavy demand for public transport, cycling and other travel information. Preparatory work with the adjacent three local authorities in order to move from the 234 Car share Scheme to the new Greater Bristol 2Carshare.com scheme (with launch in June 2005) 12	Measures to raise awareness and influence travel behaviour through the JLTP including promotion of walking and cycling, air quality awareness, advice for motorists on cutting pollution, advice to car buyers, promotion of alternative fuels, the 'Switch Off' campaign, health promotion and real time pollution information.	Continued promotion of Switch Off campaign including new signs at schools and other locations and sticker campaign extended to surrounding authorities. Continued promotion of driver behaviour materials and integration of air quality issues into wider BCC publicity and transport awareness	Continued promotion of Switch Off campaign and Thank You for Not Driving signs and stickers including new signs at schools and other locations. Continued promotion of driver behaviour materials and integration of air quality issues into wider BCC publicity and transport awareness	Continued promotion of driver behaviour materials and integration of air quality issues into wider BCC publicity and transport awareness	General Travel Marketing work as part of LTP Smarter Choices Programme. The level of Travel Awareness work has been increased in the last 12 months through the resources available as part of the Cycling City Project. General Travel marketing work as part of LTP Smarter Choices Programme. Focussed work on Smarter Choices measures has been increased as part of the Cycling City	General Travel Marketing work as part of LTP Smarter Choices Programme. The level of Travel Awareness work has been increased in the last 12 months through the resources available as part of the Cycling City Project. General Travel marketing work as part of LTP Smarter Choices Programme. Focussed work on Smarter Choices measures has been increased as part of the Cycling City	The level of Travel Awareness work has been increased in the resources available as part of the Cycling City Project. Further travel marketing work planned through LSTF project. General Travel marketing work as part of LTP Smarter Choices Programme. Focussed work on Smarter Choices measures has been increased as part of the Cycling City	The level of Travel Awareness work has been increased through the resources available as part of the Cycling City Project. Further travel marketing work underway through LSTF projects. General Travel marketing work as part of LTP Smarter Choices Programme. Focussed work on Smarter Choices measures has been increased as part of the Cycling City Project.	Ongoing

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s	
					community/neighborhood based sustainable transport projects supported through Neighbourhood Transport Initiatives scheme.		s work. Real-time pollution information added to Council web pages. Dissemination of best practice – held 5th annual air quality management conference	pollution information included on Council web pages. Dissemination of best practice – held 6th annual air quality management conference	Driving and Switch Off campaigns including new signs at schools and other locations. New journey planner currently being developed.	Project.	Project.	Project.			
LTP	Signing / route guidance			Extension of pedestrian scheme to Bedminster/Southville areas of inner Bristol completed. Completion of detailed design, commissioning of materials for signing scheme commenced. Extension of pedestrian signing scheme to Clifton completed. Enhancement	Design work carried out with match funding towards Objective 2 bid to extend Legible City into St Pauls area. Application submitted and agreed work to commence on site March 2006.	Improved Variable Message Signing (VMS) and enhanced provision of Real Time Information									No longer reported



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				of 'brown sign' signing to tourist attractions completed in partnership with Bristol Tourism Bureau and key attractors. Map of proposed reclassification of road hierarchy completed.										
	LTP	Public Transport Informatio n		<ul style="list-style-type: none"> <li>Following an extensive user requirement exercise, a licence prepared for refitting and occupation by the Council and First of city centre</li> <li>TravelBristol Info Centre providing a range of transport information and services.</li> <li>Systems integration work in progress to use common outputs and definitions to serve real time</li> </ul>	<p>INTEGRATED TRAVEL INFORMATION CENTRE (ITIC):</p> <ul style="list-style-type: none"> <li>- Refit and occupation of TravelBristol info centre in a retail unit in a city centre location. Refit works carried out under contract to First and Bristol City Council.</li> <li>- Technical installation throughout the unit to support electronic information provision and Council hot-desk PCs. Inclusion of audio and visual multi-media</li> </ul>	<p>Compreh ensive strategy develop ed to encourag e more people to use bus services. Seeks to improve access to bus informatio n (e.g. via the internet, real time informatio n systems, roadside informatio n kiosks, roadside</p>								No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			<p>congestion and air quality data.</p> <ul style="list-style-type: none"> <li>• TravelBristol Info Bus mobile clean fuel transport information vehicle launched and first used at Southville Home Zone consultation in December 2003.</li> </ul> <p>PTI 2000: Continuation of South West Traveline project.</p>	<p>facilities to allow presentation of information to wider audiences. Ability to configure presentations appropriate to target audience and event (e.g. day to day presentation, project launches). - Training on the info centre systems undertaken for 20 members of BCC staff. - Development of system specification to allow integration of info centre with other Council initiatives i.e. ensure outputs from other projects can be accessed through the info centre. - Continued use of the TravelBristol info bus at numerous travel awareness events. PTI 2000: The Bristol dataset has</p>	<p>bus stop route and timetable information) and to improve information quality.</p>								

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				<p>been maintained at a minimum of 95% completeness during 2004/05, and the % of the dataset that has been verified exceeded 50% for the first time. Throughout 2004/05 the Traveline SW call centre in Exeter maintained its very high ranking in the national performance league table for Traveline call centres. The first trial SMS services for scheduled service data were launched by SWPTI in Swindon and Devon. A 'groundbreaking' project to allow all fares for the Traveline SW region to be offered through the call centre was initiated, with an expected launch date of mid-2006. The</p>									

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
					SW is the region leading nationally on fares.									
	LTP	Parking information												No longer reported

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
Promotion and Provision of Alternatives	LTP	Public transport initiatives – Bus		Bristol's first Showcase routes, the 76/77 services North and South on the A38 between Henbury, the city centre and Hartcliffe was formally launched in December 2003; Parson Street gyratory was substantially re-built incorporating a new contra-flow bus and cycle lane; Mini-roundabout at the busy A38 Cheltenham Road/Cotham Brow junction was replaced with traffic signals; A new, high quality car park for shoppers was provided to serve the Gloucester Road retail area; Over 30 new 'Real Time' information	Patronage on Bristol's first Showcase route, the 76/77 service between Henbury, the city centre and Hartcliffe launched in December 2003, has continued to grow, increasing by a further 8% between April 2004 and April 2005. In addition, the provision of 1.5 kilometres of cycle lanes on the route has resulted in cycling on the northern section of the route increasing by 13% between April 2003 and April 2005. A further 36 bus stops were equipped with raised kerbs in 2004/05 to provide level access for wheelchairs and pushchairs on to low floor buses. The majority of these stops have been on the	Program me of upgraded 'Showcas e bus routes' being implemen ted through JLTP, includes extensive priority measures across our area as part of the Major Scheme bids.								No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			(RTI) displays were provided at key stops giving accurate predictions of bus arrivals; buses on the 75, 76 and 77 services have also been equipped with 'Intelligent Priority' equipment; New bus stops were provided at Parson Street and serving the Gloucester Road retail area; Approximately 1.5 kilometres of new cycle lanes have been provided as part of the route; New reduced exhaust emissions vehicles for the 76/77 service were delivered by the operator, First in Bristol Ltd, in July 2003; a further 50 stops were equipped with	A420/A431, as the first stage of the implementation of Bristol's second Showcase bus route between Kingswood, Hanham and the city centre. Initial design and survey work has been completed for the A420/A431 route, culminating in a programme of nonstatutory consultation with local businesses, residents and stakeholders in January, February and March 2005, including a series of public meetings and workshops. The proposals comprise a package of bus priority and traffic signal upgrades to substantially improve the quality and reliability of bus									

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			<p>raised kerbs; Insufficient resources were available in 2003/04 to upgrade the 54 service; A low-floor minibus was purchased in 2003/04 for delivery in June 2004, following conversion of the engine to a diesel-electric hybrid; The pilot 'Yellow Bus' project, serving Henbury school in North Bristol, commenced operation in June 2003; finalised Local Bus Information Strategy was approved in July 2004.</p>	<p>travel, together with improvements to pedestrian and cycling networks. Concerns raised by local businesses over the potential damage to passing trade resulting from parking restrictions are being addressed by planned improvements to existing off-street car parks and upgrades to paving and landscaping in the Church Road shopping area. Detailed design is now underway, including the commissioning in 2004/05 of consultants to complete a comprehensive micro-simulation traffic model of the corridor over a length of 4 kilometres between the city centre and St George.</p>									

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				<p>Upgrades to traffic signal junctions and bus stops will be undertaken in 2005/06, with the bus priority measures, including a planned contraflow bus lane, following in 2006/07.</p> <p>As part of the quality bus partnership between First Bristol Ltd. and the city council, the Wine Street zebra crossing was replaced by a wide puffin crossing in November 2004, substantially reducing delays for bus passengers travelling towards Broadmead shopping centre from Baldwin Street.</p> <p>Ongoing work on the first Showcase route has included the implementation of a dual puffin crossing on</p>										



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				<p>Redcliff Hill in association with the southbound bus lane works delivered the previous year. Design work on the Redcliff Hill northbound bus lane, together with the partial signalisation of the Redcliff Hill/Redcliffe Way roundabout, was completed in 2004/05 and implementation is scheduled by autumn 2005. A study brief has now been prepared for the Gloucester Road retail study, and consultants are to be appointed in September 2005 to undertake this study. CITY CENTRE BUS SERVICE UPGRADE: 2 new low floor vehicles purchased to operate with the existing hybrid bus on the 500 Baltic Wharf loop</p>									

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				<p>bus service. Vehicles have been given distinctive livery. Contracts have been extended and enhanced to improve frequency and provide better accessibility. New operation commenced in June 2005. Work on of stop upgrades, preparatory work for new raised boarding platforms and shelter locations has continued. PILOT SCHOOL BUS PROJECT: Service enhanced to provide 2 daily trips to and from Henbury School. It is expected that over 25,000 single passenger journeys will be made on the service during the 2004/05 academic year, an increase of nearly 50% on the previous year. The project continues to be</p>									

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				<p>successful in achieving modal shift from the private car, together with wider benefits of improving school attendance among those that use it, and improving the behaviour of pupils whilst they are travelling to and from school. The 2nd year of the pilot is set to finish at the end of July 2005 and consideration is being given to extending the project further.</p> <p>LOCAL BUS INFORMATION STRATEGY: Significant improvements to bus information have been provided at the key interchanges of Temple Meads and Southmead Hospital. The new information includes bus stop finder maps and details of all services serving the localities.</p>										

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				<p>In addition, the Real Time Information elements of the 76/77 Showcase bus route were completed with the implementation of a further 16 Passenger Information displays in 2004/05, and a further 3 'pole-mounted' RTI displays in April 2005.</p> <p>The Council has been working with First and South Gloucestershire Council in 2004/05 to produce a new 'Greater Bristol Bus Map' due for completion in Summer 2005.</p>									

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LTP	Public transport initiatives - Park & Ride		A planning application supported by the Council has been submitted for a Park and Ride site to serve the A38 Bridgwater Road; In 2003/04 a joint study commenced with Bath & North East Somerset (B&NES) Council to investigate the feasibility of a Whitchurch bypass and a park and ride site to serve Bristol; In December 2003 the Council commissioned a feasibility study to identify suitable sites to serve the M32 corridor; Total patronage on the Portway 902 service in 2003/04 exceeded	A38 Bridgwater Road Park & Ride planning application supported by the Council is awaiting determination. Assessment of demand and suitability of sites to serve the M32 corridor, is ongoing. Total patronage on the Portway 902 service in 2004/05 exceeded 243,000 passengers on the Portway 902 service, an increase of 28% on 2003/04. Brislington New Cctv implemented in June 2004. Brislington Expansion Study & Planning Application; Brislington Land Purchase: The expansion site selection process has been undertaken in conjunction with demand assessment.	Park and ride developm ents to be brought forward in JLTP period, to be co-ordinated with parking managem ent measures , to encourag e a switch from private car trips to bus-based park and ride. Expansio ns proposed at existing park and ride sites in Bath and Bristol, and possible new sites to be investigat ed.								No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			190,000 passengers on the Portway 902 service, an increase of 57% on 2002/03; In November 2003, directional signs were installed on the M5 and M49 motorways on the approach to the corridor, in partnership with the Highways Agency; The Redcliffe Way 24-hour bus lane and bus gate, completed in September 2003, has reduced journey times and improved reliability on both the 902 and 904 (Brislington) park and ride services; Expansion of Portway Park & Ride will be considered in a future capital programme;	Negotiations have been opened with the landowner of the expansion site to facilitate early purchase of required land.									

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			The A4 Bath Road Park and Ride Capacity and Expansion study commenced in July 2004. The study will identify options for expansion of the 1300 space site which is presently operating close to or at capacity.										
LTP	Public transport initiatives – Rail		Station enhancement schemes at Stapleton Road, Bedminster and Montpelier, completed in Summer 2003, jointly funded by the Council and Wessex Trains, with a developer contribution for a new entrance canopy at Montpelier; proposals have been drawn up for similar improvements at the remaining local	Station enhancement schemes at Lawrence Hill and Parson Street including new shelters, seats, timetable poster panels and signage were completed in Spring 2005, jointly funded by the Council and Wessex Trains. Also, a renewal of signage at all Bristol local station has been completed, incorporating a distinctive new logo on Severn Beach line stations. The	Opportunities for significant enhancement in local rail are somewhat limited within the JLTP period.								No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			stations to be commenced in Summer 2004; re-modelling of Filton Junction and construction of an additional platform at Filton Abbey Wood completed June 2004; development of the Bristol to Weymouth line as a community railway and a tourism, leisure and commuting route; identifying depot location, negotiating land purchase with Rail Property Ltd and strengthening the Cumberland Road over-bridge, which will enable a trial Bristol Electric Railbus to be implemented in future.	council continues to liaise with the train operating companies, the SRA and government in relation to frequency and timetabling of local and regional services, national and train company policy matters, and to pursue the joint local rail strategy. The council continues to provide revenue support of the weekday service on the Severn Beach line. A new Severnside Community Rail Partnership was set up in 2004 to cover local routes radiating from Bristol. No funding allocated for BER in 2004/05 because bridge strengthening work at Cumberland Road made the railway line from									



	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				Wapping Wharf inoperable. Negotiations continued to acquire the line from Rail Property Limited.									
LTP	Public transport initiatives – other (LRT)		City Council continued to develop the LRT scheme appraisal in dialogue with DfT. WATER TRANSPORT: General enhancements to landing stages.	The Council resolved in January 2004 to discontinue development of the LRT scheme in the light of uncertain funding prospects. WATER TRANSPORT: No funding allocated in 2004/2005. New landing stages at SS Great Britain and Nova Scotia remain a priority when funding becomes available. A new contract for the commuter ferry service was awarded in April 2004 to operate for a further 2 years. The council is working with the operator to continue to monitor and promote this									No longer reported

	AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7-2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progresses
				service. A cross harbour ferry service linking the SS Great Britain with Capricorn Quay was introduced in Autumn 2004.									
LTP+	2 Travel Plans	Well-established programme of Travel Plans through LTP. Accelerate the adoption of voluntary travel plans for businesses and schools located within AQMA by providing assistance and incentives. Sustained action over the life of the AQAP.	Continuing support for travel plan initiatives amongst employers and visitor attractions in Bristol.	Corporate Travel Plan: Adopted in September 2004. Five workplace Travel Plans have been formally adopted and 10 more are complete and awaiting adoption. Travel Plans for a further 23 buildings in progress. Voluntary Travel Plans: Surveys completed and analysed for 5 major employers. 4 Travel Plan grants awarded. 2 new Travel Plan awards for Bristol (1 silver, 1 bronze) totalling 5 Bronze, 12 Silver and 6 Gold. 1 new Travel Plan network established in	The good progress made within LTP1 period will be continued across the JLTP area.	Continued progress being made on workplace travel plans through LTP / Planning process. Additional resources provided to 3 schools within AQMA as a pilot project to assist in promoting walking to school as part of school travel plans. The results of the scheme are not	Continued progress being made on workplace travel plans through LTP and Planning process. Results from schools that received additional AQAP resources to promote walking to school are awaited. Provisional data suggests a 14% reduction in single car trips to school.	Continued progress being made on workplace travel plans through LTP and Planning process. Sustainable Schools Strategy being developed. Additional focus on school travel plans to increase the take-up rate and achieve the target of all schools having a travel	144 of 180 schools in Bristol (80%) now have school travel plans in place. Expected all schools will have travel plans by March 2010.	145 of 171 schools in Bristol (84%) now have school travel plans in place.	96% of LEA establishments now have school travel plans in place.	96% of LEA establishments now have school travel plans in place. Remaining establishments generally academies and independents outside LEA control. Provision and update of travel plans now voluntary process though plans, still being updated. Andalusia Academy in process of preparing a school travel plan.	Ongoing work to increase schools with approved travel plans within BCC authority area and across West of England area.

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				South Bristol.		yet available.	A further 5 schools are to receive focused support in 2007/08 to develop travel plans and personali sed travel planning as part of a Healthy Schools project.	plan by 2010. 118 schools now have travel plans.					

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	LTP+	3 Safer Routes to School	Established program me of SRS in LTP (4-6 per year), Needs additional focus within the AQAP. Accelerate the implemen tation of SRS for schools within the AQAP. 3 additional schools per year over 8 years.	5 Safer Routes to School Schemes implemented: Holymead Junior School Hartcliffe School area- wide project Phase 1 & 2 Air Balloon Infant and Junior Victoria Park Infant & Junior Phase 2 Christchurch Primary School Detailed design completed on Phase 3 of Hartcliffe School Area wide project Preliminary design completed for Elmlea Infant & Junior School and Ashley Down Infant & Junior School 30 School Travel Plans have been completed in the last 2 years, accounting for 17% of all local authority	Hartcliffe Phase 2-completed the section of traffic calming on Hareclive Road and Moxham Drive comprising a mandatory 20- mph speed limit with associated physical traffic calming and improved cycle infrastructure. Elmlea Infants and Junior School – completed and area wide SRTS scheme on routes to three schools comprising a number of improved pedestrian crossing facilities and cycle infrastructure. A range of smaller measures including wig wags being installed at St Joseph's, Parson St and Ashley Down infants and Junior. Feasibility design carried out on phase 2	Ongoing program me of Safer Routes to School projects and developm ent of School Travel Plans across the JLTP area.	Good progress being made through LTP but no additional AQAP measures introduce d.	Good progress being made through LTP but no additional AQAP measures introduce d.	SRS approach being integrate d into the Health Schools initiative described in 2 above and delivered through LTP.	Programme being developed and prioritised on the basis of School Travel Plans, including zigzags reducing congestion outside schools	Programme being developed and prioritised on the basis of School Travel Plans, including zigzags reducing congestion outside schools	Expansion/ improvement of sustainable travel to school and promotional works planned through LSTF bid project. 3yr project to begin 2012/13 subject to DfT approval	Expansion/ improvement of sustainable travel to school and promotional works planned and underway through LSTF key component and WEST projects.	Ongoing

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			schools in the city. Production of Travel Plans is now routinely in use as a Planning Condition for schools wishing to undertake development, and the Healthy Schools Programme now requires Schools to produce Travel Plans as part of its accreditation. Most of these schools will be eligible for capital funding from the DfES to spend on a variety of related improvements e.g. cycle parking)	of Air Balloon Infants and Junior School.									
LTP+	4 Shorter Journeys (including Individualised Travel Marketing)	Individualised Travel Marketing targeted at shorter journeys being piloted through	Travel Smart Project Inception/Project Design/Baseline Travel Survey/Marketing Actions. 1,761 households	Travel Smart Project in Bishopston/Ashley/St Andrews completed on target and monitoring completed. Successful in achieving	Establish package of linked measures at local level (including safer routes to school,	PTP project completed in Easton area of Bristol within the AQMA (adjacent	6th PTP project completed in Bristol in 2006. PTP estimated to deliver a 10%	7th PTP project completed in Bristol in 2007. The project was extended	Further PTP Projects currently underway across the North of the AQMA area. Progress	Further PTP Projects currently underway across the North of the AQMA area. Progress	Further PTP type projects are planned through the LSTF project subject to DfT approval.	Further PTP type projects are underway and planned through the LSTF projects.	Ongoing No specific NOx analysis, but PTP projects have shown a

	AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progress
		VIVALDI project. Identify additional areas and roll out Shorter Journeys Strategy including ITM in 2 new areas per year. Introduce and evaluate pilot home delivery scheme.	successfully contacted in the Bishopston/Ashey and St Andrews Area (part funded by DfT). 10,627 travel Information items distributed. Hartcliffe/Bishopston Phase 1 Travel Smart Project completed. Hartcliffe/Bishopston Phase 2 completed – 1,200 households approached – 354 interested.	significant and substantial changes in travel behaviour amongst target population of nearly 2000 households. Relative reduction in car trips of 11% and car distance 13% (a net saving of 1.7 car kms per year amongst the target population) New area identified for next project 2005/06. (Bedminster / Southville)	home delivery schemes, personalised travel planning, cycle training etc). Establish target areas and undertake pilot projects within AQMA.	to the M32), covering 1500 households. PTP concept extended to include air quality materials and information designed to influence driver behaviour . Project successful and early monitoring indicates a 10% decrease in car tips but 'after' monitoring will not be carried out until the end of 2006.	decrease in car trips among participating households. Further areas planned for 2007/08. The inclusion of air quality materials and information designed to influence driver behaviour pioneered in earlier PTP projects has now been mainstreamed .	to promote the newly completed showcase bus route through a nearby area. Changing driver behaviour to reduce emissions was an integral part of this project. Previous projects have achieved around a 10% decrease in car trips among participating households. Further areas planned for 2008/09.	has been accelerated through Cycling City Project over the last 12 months covering the Redland, Bishopston and Horfield areas of the City.	has been accelerated through Cycling City Project over the last 12 months covering the Redland, Bishopston and Horfield areas of the City.		10% decrease in car use amongst participating households.	

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	LTP+	5a Walking	Walking strategy – program me of action in LTP. Undertak e study of barriers to walking within AQMA. (see also Measure 9 area- based speed reduction)	Surface puffin crossing installed on Oatlands Avenue (near the junction with Quickthorne Close), and pedestrian subway at this location stopped up and closed; Easton Way subway closures; One existing public footpath improved to fully accessible standards (jointly with the Parks Service to fully integrate into adjacent playing fields). Route also provides traffic free access to local Infants and Junior Schools (West Town Lane); Preliminary design and environmental assessment works carried out on 3 other Rights of Way.	Crox Bottom – completed the upgrade of the old footpath to provide a shared use path through the open space extending the Malago Greenway radial route, approximately 850 metres. Completed the Dings Railway path. A new 260 metre shared use path on the old Bristol to Bath railway. This is the first phase of three connecting the 15 mile Bristol Bath Railway path to Temple Meads Station. Constructed a 370 metre shared use path along the Feeder canal in Netham Park, extending the Avon Trail. In partnership with Bath and North East Somerset, North Somerset, South Gloucestershire councils and the Avon and	Develop high quality pedestrian and cycle networks to encourage more walking and cycling and to reduce reliance on the private car. Cycling network and promotion covered in JLTP. Scope for improved facilities within Bristol AQMA in particular cycle training, improved parking and other facilities.	Progress being made through LTP with an 8% increase in cycling since 2004 and 38% increase since 1998, and a 9% increase in walking last year and a 14% increase since 2000. No additional AQAP measures introduced.	Progress being made through LTP with an 8% increase in cycling since 2004 and 38% increase since 1998, and a 9% increase in walking last year and a 14% increase since 2000. No additional AQAP measures introduced.	Progress being made through LTP with an 12% increase in cycling since 2006 and 80% increase since 1998, and a 16% increase in walking last year and a 38% increase since 2001. No additional AQAP measures introduced.	Walking Strategy currently under review, as part of walking elements of forthcoming Joint Local Transport Plan 3. Initial stakeholder consultation held in February 2010 on Walking Strategy for Bristol, draft and follow up work ongoing. Linking to Draft Walking Supporting Statement prepared as part of forthcoming Joint Local Transport Plan 3	Initial stakeholder consultation held in February 2010 on Walking Strategy for Bristol, draft and follow up work ongoing. Linking to Draft Walking Supporting Statement prepared as part of forthcoming Joint Local Transport Plan 3	Walking Strategy adopted/ published October 2011, as part of walking elements of Joint Local Transport Plan 3. 2011 Census data recently released showed number of people walking to work in Bristol grew by 47% between 2001 & 2011.	Walking Strategy adopted/ published October 2011, as part of walking elements of Joint Local Transport Plan 3. 2011 Census data recently released showed number of people walking to work in Bristol grew by 47% between 2001 & 2011.	JLTP3 Walking Supporting Statement, part of finalised JLTP3 document 2011- 2026 published March 2010/11 . Bristol Walking Strategy adopted various actions ongoing

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	LTP+	5b Cycling Facilities	Cycling network and promotion covered in LTP. Focus extra resources within the AQMA for cycle routes, parking and changing facilities at destinatio ns and cycle training.	Completion of new shared use cycle path linking Cabot Park to A403, part of NCN Route 4; A range of smaller measures implemented throughout the city e.g. cycle parking, advanced stop lines, and cycle lanes; Preliminary design work carried out on 4 schemes on radial routes in the city: Frome Greenway - improvements to Stapleton Road linking to Eastville Park/ Feeder Route – upgrade of existing canal side route to provide shared use path through Northern Park/ Crox Bottom – upgrade of existing footway to provide shared use path	Somerset constabulary, produced an awareness raising leaflet about the inconsiderate pavement parking for distribution by the Police and Road Safety Staff. Public Footpath No's 364 and 365 Lambs Hill, St George- Construction of new steps and resurfaced footpaths to provide improved accessibility. Public Footpath No 42, Southmead- construction of new sealed surface tarmac path which is well used by pupils and parents of Elmfield Deaf School and Westbury on Trym Primary School. Provision of a new granular surfaced path				Pedestrian and cycle improvements to be incorporate d into Greater Bristol Bus Network Major Scheme (GBBN) programme of works now due to commence in 2008/09. Connect2 cycle route from Nailsea to Bristol to be developed in partnership with Sustrans. Pilot city centre bike rental scheme (Hour Bike) to commence in 2008. Internet cycle trip planner to go live in 2008. Cycle trips have increased	Pedestrian and cycle improvements to be incorporate d into Greater Bristol Bus Network Major Scheme (GBBN) programme of works now due to commence in 2008/09. Connect2 cycle route from Nailsea to Bristol to be developed in partnership with Sustrans. Internet cycle trip planner to go live in 2008. Cycle trips have increased 60% on 03/04 baseline. Improvements through ongoing GBBN scheme,	Improvements through ongoing GBBN scheme completed in March 2012, Connect2 route complete. £22 million Cycling City Project delivered. Project finished in March 2011 however many further cycling measures are ongoing. Local Sustainable Transport Fund (LSTF) key component project underway including cycle improvements due in 2012/13.	Pedestrian and cycle improvements incorporate d into Greater Bristol Bus Network Major Scheme (GBBN) completed March 2012. £22 million Cycling City Project delivered. Project finished in March 2011 however many further cycling measures are ongoing. 2011 Census data recently released shows numbers of people cycling to work have doubled between	Ongoing . BCC propose to build on the LSTF business s engage ment program me and extend the successful loan bikes to business s program me to electric pool bikes.	



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			through open space; Extension to Bristol to Bath Railway Path to link to Dings Home Zone and Temple Quay developments; Improved facilities for cyclists have also been included in the A38 Showcase bus corridor; various cycle promotion schemes.	linking Public Footpath No's 245 and 24 - Fishponds Provision of new metal Public Footpath Signs as part of the Elmlea Safer Routes to School scheme. This provides a network of signed public footpaths for children to use as part of their journey to and from school. Feasibility design for Public Rights of Way No 464 - Knowle, carried out. This included full a structural and topographical survey A range of smaller measures implemented throughout the city e.g. cycle parking, advanced stop lines and cycle lanes. In partnership with Bath and Northeast Somerset, North					40% on 03/04 baseline. Improvements through ongoing GBBN scheme, Connect2 route complete. Initial hourbike rental scheme commenced. Cycle City status awarded, with a £22 million programme of cycling investment ongoing until 2011/12.	Connect2 route complete. £22 million Cycling City Project delivered. Project finished in March 2011 however many further cycling measures are ongoing.		2001 and 2011. Local Sustainable Transport Fund (LSTF) WEST project awarded £24 million June 2012 with various cycle promotion and infrastructure works underway, building on work already undertaken through LSTF £5 million key component project. Further cycle infrastructure works planned in and around Bristol Enterprise Zone.	

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				<p>Somerset and South Gloucestershire Councils, a cycle map that shows the cycling condition of every road in the old Avon area was designed and consulted on. This is a new concept in cycle mapping. 294 adult cycle training sessions were delivered, 28% higher than in 2003/4 and compares with the target of 200. This was possible due to the larger pool of trainers coupled with an increase in demand. 48 cycle parking facilities were introduced. 9 cycle promotion presentations/ev ents were held Bristol's Biggest Bike ride successfully held in partnership with IKEA for the second year – 4,200 took part. Cycle Resource Centre (the</p>									

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				<p>'Bristol Bike Shed') completed in partnership with 'Mud Dock' and Department for Transport grant. This is the first purpose built resource of its type in the UK and its already generated substantial local media interest. The centre provides secure parking/ lockers/ showers/ information/ maintenance and has direct access to a café. New set of cycle maps covering the Greater Bristol area close to being completed.</p>									

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	LTP+	6 Car Clubs	Car Club establishe d in Bristol and members hip levels are growing. Target additional Car Club locations in areas of high levels of older car ownershi p. Offer introducto ry members hip offer to increase members hip.	Second year of contract with providers 'Smart Moves' saw Car Club extending into new areas and significant growth in membership. 5 dedicated on- street bays installed following consultation with residents [10 more scheduled for 2004/05]. Five additional bays and three cars secured through planning agreements as a result of integrating car clubs into land- use planning procedures. Increased marketing and awareness programme underway.	Third year of contract with Smart Moves to expand car club. The club has now grown to 180 members using 18 cars. This year, the council delivered a further 8 dedicated parking bays for cars parked on- street. Three Section 106 agreements signed with developers for the provision of car club services. Substantial marketing carried out with the operator.	The Councils will aim to ensure that existing car clubs becomes self- financing, facilitate the setting up of new car clubs and expansio n of existing ones where there is demand and develop members hip targets.	Continue d expansio n of car club through LTP. Car club now has 26 cars and over 400 members . 4 year pilot project ends in 2006 when the car club will operate without Council subsidy. Significan t additional investme nt is starting to come on- stream through the planning system with over £200,000 of potential contributi ons	Continue d expansio n of car club through LTP. Car club now has over 30 cars and over 500 members . Pilot project ended in 2006 and the car club is now operating without Council subsidy. Framework agreeme nt is being drawn up to secure substanti al additional investme nt in car clubs through the planning process.	The Bristol Car Club has continued to expand and now has 39 cars and 600 members . Since the pilot project ended in 2006 the club has continued to operate without Council subsidy. Growth of the club continues to be boosted by funding secured by the Council through Section 106 contributi ons from planning applicatio ns.	Car Club in Bristol has expanded further with membershi p now standing at over 1,200, with 45 cars and bays currently and more planned. Continued growth in Bristol Car Club with further bays and cars being provided. New company Street Car Club expected to commence operation in Bristol later in 2010, providing element of competition and a market with existing Bristol City Car Club.	Car Club in Bristol has expanded further with membershi p now standing at over 1,200, with 45 cars and bays currently and more planned. Continued growth in Bristol Car Club with further bays and cars being provided. New company Street Car Club commence d operations in Bristol later in 2010, providing element of competition and a market with existing Bristol City Car Club	Further expansion by competing Car Club operators has resulted in membershi p across Car Clubs increasing to around 2,000 members using 63 cars by September 2011. More growth is anticipated as further bays are put in and operators expand.	Car Clubs in Bristol have expanded significantly in recent years. New company Street Car Club renamed Zip Cars commence d operations in Bristol in 2010, providing element of competition and a market with existing Bristol City Car Club. A further 23 car Club cars have been delivered on street in 2012/13. Together with a further 14 off road car club bays. This means that 100 car club vehicles are now	Ongoing

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
							identified.						available across Bristol. Further expansion is ongoing with 23 new cars and bays to be delivered in 2013/14.	
	LTP	Powered twowheel ers (PTW)				PTW strategy being develope d in JLTP. Congestio n benefits from PTWs. Case for promotion on air quality requires further work.								No longer reported
Managing the Road Network	LTP	Revision of the road hierarchy				Revised road hierarchy as part of JLTP								No longer reported
	LTP+	7 Reallocatio n of Road (Bus Priority measures )	Major program me of bus priorities in LTP. Additional problem sites to			As part of bus Major Scheme Bids new Showcas e routes and extensive	Implemen tation of bus priorities through LTP Showcas e Bus	Implemen tation of bus priorities through LTP Showcas e Bus	Implemen tation of bus priorities through LTP Showcas e Bus	The Greater Bristol Bus Network Scheme (GBBN) approved by Daft in	The Greater Bristol Bus Network Scheme (GBBN) approved by Daft in	GBBN corridor works completed March 2012.	The Greater Bristol Bus Network Scheme (GBBN) approved by Dft in	Ongoing

		AQAP1 April 2004	Initial status/ac- tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres- s
			be improved ahead of 'Showcase' programme. Preliminary assessment of possible sites has been undertaken and 5 sites identified. Implement priority measures at 5 sites over 3 years and identify possible additional sites.			bus priorities which will reallocate roadspace to more efficient modes of transport.	Routes programme. Works programme for the A420 corridor over the next two years. No additional AQAP measures introduced.	Routes programme. Works on the A420 corridor are underway and Greater Bristol Bus Network works will commence in 2008 (when final approval is granted). No additional AQAP measures introduced. City Centre Review and the Review of Road Hierarchy will potentially result in changes in road space allocations.	Routes programme. Works on the A420 corridor were completed in 2007.	May 2008. £70 million investment programme across Greater Bristol area now underway, to deliver 10 further showcase routes. 8 of which serve the Bristol AQMA. Key work on Bristol area of GBBN progressed, such as A432 Fishponds Road.	May 2008. £70 million investment programme across Greater Bristol area now underway, to deliver 10 further showcase routes. 8 of which serve the Bristol AQMA. A370 GBBN route Completed. Key work on Bristol area of GBBN progressed, such as A432 Fishponds Road, A4018 and A4 Bath Road corridors due for completion March 2012.		May 2008. £70 million investment programme across Greater Bristol area now complete, to deliver 10 further showcase routes. 8 of which serve the Bristol AQMA. GBBN corridor works completed March 2012. £5 million secured across West of England through 'Better Bus Fund', which will provide significant further investment in local bus network.	

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	LTP+	8 Improved enforceme nt of existing speed limits	Speed managem ent strategy being produced. Additional resources required to undertake blanket approach to tackle speeding and harsh driving. Implemen t measures to encourag e smoother driving and reduce speeding on key routes / areas within AQMA.			Speed managem ent being develope d through JLTP closely linked to review of road hierarchy. Additional resources targeted within the AQMA (police enforcem ent / cameras (in co- operation with Speed Camera Partnersh ip)/ road design) could significan tly reduce emissions . Red light / speed on green cameras could have significant effect on emissions by	Some progress through LTP but no additional AQAP measures introduce d.	Some progress through LTP but no additional AQAP measures introduce d.	Some progress through LTP but no additional AQAP measures introduce d.	Continued support for Safety Camera Partnership	Support for Safety Camera Partnership . Discussions are ongoing regarding future of fixed speed camera sites.	Fixed camera sites have been discontinue d. Ongoing monitoring through mobile surveillanc e.	Fixed camera sites have been discontinue d. Ongoing monitoring through mobile surveillanc e.	Ongoing

	AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7-2010/11 moderating vehicle speeds & driving style.	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progresses
LTP+	9 Area-based speed reduction (20 mph zones in residential areas )	20 mph limits in residential areas planned in revised Road Hierarchy . Programme of 20 mph zones around schools being introduced through the LTP. Additional resources required for residential areas within AQMA. Implement area-wide lowcost speed management measures in residential	Advisory 20mph have been implemented at 23 sites across the city, covering a total of 36 schools.		Programme of traffic calming around schools in JLTP.	Progress on 20 mph zones around schools through LTP but no additional AQAP measures introduced.	Progress on 20 mph zones around schools through LTP but no additional AQAP measures introduced. Further 20 mph zones may result from Road Hierarchy Review.	Progress on 20 mph zones around schools and adjacent to Showcase bus routes delivered through LTP but no additional AQAP measures introduced. Draft Road Hierarchy Review proposes 20 mph speed limit in all residential areas.	Following initial studies 2-planned pilot zones were identified using accident information identifying higher pedestrian / cycle accidents with no obvious pattern, and suitable type and layout of streets. Consultation was carried out ending September 2009, evaluated and finalised pilot 20mph zones are now set to be implemented.	Traffic Counts were taken from December 2010 to January 2011. The walking and cycling counts and household surveys that were conducted in the area in August 2009 will be repeated in August 2011, once the scheme had been in operation almost a year. Further survey work is planned. Citywide plans now being prepared following positive results	Traffic Counts were taken from December 2010 to January 2011. The walking and cycling counts and household surveys that were conducted in the area in August 2009 were repeated in August 2011, once the scheme had been in operation almost a year. Further survey work is planned. Citywide plans now being prepared following positive results	Consultation from residents and stakeholders on 2 planned inner-city pilot 20mph zones. These pilot zones were implemented in 2010 (Inner South zone in May 2010 and Inner East zone in October 2010) following assessment of these pilots, further expansion of 20mph zones is planned across the city. Citywide plans in place following	2 Pilot zones completed by 2011. Citywide phased rollout estimated for completion by January 2015. No specific target emissions reduction, but air quality monitoring was conducted on the two pilot zones. Further monitoring will be carried across the city.



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			l areas within AQMA.							Consultatio n from residents and stakeholder s on 2 planned inner-city pilot 20mph zones. These pilot zones to be implemente d Spring 2010 following assessment of these pilots, further expansion of 20mph zones may be conducted across the city.		showing around 70% supporting rollout.	positive results showing around 70% supporting rollout citywide. Phased implementa tion of 20mph planned with consultatio n underway began for phase 1 Sept 2012, phase 2 Jan 2013.	The effect on air quality in the pilot zones conclud ed to be too small to be measur able, although positive impact should be seen over time associat ed with modal shift.
	LTP	Home Zones		Southville Home Zone Challenge bid. Continuation of outline consultation and survey work working through to outline and detailed design during spring/summer 2003. Progress	Following formal consultation the Traffic Regulation Orders were advertised and approved. After the detailed public consultation through 2003/04 with workshops with street representatives and "Planning									No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			through to phased construction works autumn 2003/spring 2004 if outcome of consultation/ site surveys and TROs are positive. Budget includes staff costs. Development strategy and promotional work for new build and retrofit Home Zone schemes across the City. Budget includes staff costs.	for Real" exercises works commenced on site to construct three Home Zone Streets in Milford Street, Stackpool Rd Cul De Sac and Stackpool Rd Focal Point during September 2004. These works are now largely completed meeting the deadline for all claims to the challenge grant to be received by April 2005. The three Home Zone streets have been well received both locally and nationally and will contribute to meeting and exceeding the Community Strategy target of completing six Home Zones by 2006. Bids are now being considered for a thorough evaluation of this scheme.									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				<p>The Council has designated 3 retrofit schemes at Victory Home Zone in Bedminster, Great George Street Home Zone in St Judes, and The Dings Home Zone in St Phillips. Three streets within Southville (referred to above) have also been designated under section 268 of the Transport Act 2000. The Dings Home Zone funded through the European fund VIVALDI and New Deal for Communities has reached the half way point of construction. It is anticipated that the remainder of this scheme will be completed by November 2005. The Home Zone team will shortly be preparing designation</p>									

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
					reports for the completed new build schemes which will exceed the Community Strategy target of Six Home Zones by 2006. Following the success of these schemes there are currently 15 requests for retrofit Home Zones on the project register. In June 2005 The Surveyor (a national technical publication) ran a front-page feature on the success of the Southville Home Zone Challenge Scheme.									
LTP	Pedestrian isation													No longer reported

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	LTP+	10 Intelligent traffic signals (Traffic Urban Managem ent & Control - UTMC)	UTMC network being extended through LTP. Potential for further air quality benefits through enhance ment of the system. Extend use of selective vehicle detection for buses and trial use of 'greenwa ves' to reduce emissions within the Clear Zone. Investigat e use of improved Air Quality managem ent plans for high pollution days.	Traffic control schemes were carried out which involved: • 28 Bus Priority sites. • 7 sites were added to MOVA control • 6 to UTC control including 3 new regions • Comprehensiv e fall back timings were implemented on 40 junctions to ensure performance during comms failures. • Further investment in SCOOT / CCTV communication to provide integrated communication between sites. • Continuing development of SCOOT congestion information for ITS applications. • Muller Road / East Gate Road new	Traffic control schemes were carried out which involved: - 2 sites were added to MOVA control - 10 to UTC control. - 24 sites added to Remote Monitoring system. - a new Vehicle Message Sign control system (VMS) installed for advance traffic control. - 8 schemes implemented in association with development schemes. - 7 new pedestrian crossings. - Muller Road / Eastgate Road scheme completed and operated under UTC control. - New scheme at Dighton Street / Marlborough Street implemented, providing pedestrian facilities and SCOOT control.	SCOOT / MOVA network being extended through JLTP. Co- ordinate with other route measures to avoid benefits being offset by increasin g traffic levels e.g. Showcas e bus routes. Extend use of selective vehicle detection for buses within AQMA.s. UTMC can also be used to manage traffic speeds.	Continue d expansio n of UTMC system through LTP and Showcas e Bus Routes program me. System being develope d to incorpora te automatic number plate recognitio n (ANPR). ANPR will enable UTMC system to be enhanced including improved bus lane enforcem ent and collection of more detailed fleet profiles.	Major £1.2m upgrade of Bristol's UTMC system planned including automatic number plate recognitio n (ANPR), measures to improve bus reliability and potentiall y air pollution monitorin g. ANPR will enable UTMC system to be enhanced including improved bus lane enforcem ent and collection of more detailed fleet profiles.	Major upgrade of Bristol's UTMC system is underway including a new traffic control room, expansio n of the SCOOT network and automatic number plate recognitio n (ANPR) and CCTV systems, which will enable better manage ment of traffic and handling of road incidents.	Enhanced Traffic Control Centre operational September 2008. New traffic control room operational, CCTV being used for traffic managem ent, ANPR and enforcemen t of bus lanes. Potential Impacts of Congestion Charging are being assessed as part of the Transport Innovation Fund (TIF) work, drawing up a possible business case covering the Central Bristol AQMA.	Enhanced Traffic Control Centre operational September 2008. New traffic control room operational, CCTV being used for traffic managem ent, ANPR and enforcemen t of bus lanes. Potential Impacts of Congestion Charging are being assessed as part of the Transport Innovation Fund (TIF) work, drawing up a possible business case covering the Central Bristol AQMA.	Enhanced enforceme nt on bus lanes through ANPR cameras and possible using new traffic enforceme nt camera car.	Enhanced enforceme nt on bus lanes through ANPR cameras and possible using new traffic enforceme nt camera car.	Ongoing

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			<p>scheme mostly implemented including puffin facilities and SCOOT control.</p> <ul style="list-style-type: none"> <li>• 16 Sites added to Remote Monitoring system.</li> <li>• New junction implemented at Cheltenham Road / Cotham Brow.</li> </ul> <p>TRAFFIC SIGNAL MODERNISATION: • 3 new 'mid-block' crossings of carriageways (Toucans and Puffins) installed,</p> <ul style="list-style-type: none"> <li>• Airport Road / Bamfield Road Modified to include puffin crossings and MOVA control.</li> <li>• Falcondale Road, 3 junctions refurbished to include full pedestrian facilities and Scoot Control.</li> <li>• 32 sites improved to</li> </ul>	<p>- New junction implemented at Filton Road / Dorian Road, including SCOOT control and full pedestrian facilities.</p> <p>- Continuing investment in SCOOT / CCTV communication to provide integrated communication between sites included expanding the BCC private communications network to cover 3 SCOOT regions and enabling works to facilitate the A420 Showcase works for 2005/06.</p> <p>3 New Scoot regions were brought into operation during the year</p> <p>- UTMC development included the procurement and implementation of COMET software to enable the</p>									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			<p>comply with the current Best Value - Key performance indicator (BV165) criteria. Support provided to the bus showcase project including the following works:</p> <ul style="list-style-type: none"> <li>• 8 sites converted to puffin operation including Bus priority facilities.</li> <li>• Parson Street Gyratory 4 sites fully refurbished to include Bus Priority and Puffin crossings all operating under MOVA control.</li> <li>• 3 bus gates were installed</li> <li>• Malago Road / Sheene Road New Controller and implementation of MOVA control.</li> </ul>	<p>tactical control of the City's signal junctions and traffic information VMS. and the specification and procurement of the I map. This is a GIS based UTMC system that will link together data streams and information sources and provide a user friendly web based interface to allow public access of this information. This will include Road works data being published using a TIH compliant interface.</p> <ul style="list-style-type: none"> <li>- CCTV upgrades the current CCTV control system was brought to UTMC compliant standards as well as being expanded to allow for more cameras and 2 cameras were replaced as they were life expired. The final</li> </ul>									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				<p>completion of the A38 showcase bus priority scheme were implemented.</p> <p>Traffic Signal Modernisation: - Muller Road / Filton Avenue junction modified to include puffin crossings and SCOOT control.</p> <p>- Stoke Road / Saville Road junction modified to include puffin crossings and MOVA control</p> <p>Muller Road / Eastgate Road was installed to prevent the high degree of accidents at the location. - 34 sites improved to comply with the current Best Value - Key performance indicator (BV165) criteria.</p> <p>- 4 pedestrian crossings upgraded to puffin crossings</p> <p>Suitable fall back timings were updated on 80 of the sites</p>									



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
					throughout the city to ensure reasonable operation during times of UTC communication failure.									

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	LTP+	11 Traffic managem ent at pollution hot spots	Preliminar y identifi cation of problem sites has commenc ed. Undert take study to identify 'Hot Spots' where engi neering solutions are feasible. Implemen t measures where approp riate.			Undertak e study to identify 'Hot Spots' where engi neering solutions are feasible. Implemen t measures where approp riate. Under the responsi bilities of the Traffic Managem ent Act spec ific areas with congest ion problems will be exam ined.	Trial of Switch Off signs at one pollution hotspot introduce d in 2004. Results show around 5% of vehicles switch off their engines during peak periods therefore scheme is more likely to have an effect on awarenes s than a direct air quality benefit. Further potential sites will be considere d during 2006/07. No additional traffic managem ent	Switch Off signs continue to be trialled at several locations. Results show schemes are more likely to have an effect on awarenes s than a direct air quality benefit. Signs have exceeded temporar y duration and an applicatio n has been submitted to DfT to approve them as permane nt highway signs.	Scheme being progress ed to alleviate traffic problems at one of the worst polluted junctions in Bristol (adjacent to Junction 3 of M32). No further Switch Off signs will be installed following DfT's decision not to authorise their use as permane nt highway signs.	Improveme nts to junction 'hot-spots' including M32 Jc3, West Town / A4 Bath Rd, Jacobs Wells Rd, Sussex Place / Lower Ashley Rd, Showcase Corridor - A420 (Old Market Rbt to Summerhill Rd / Cloudshill Rd), Cabot Circus, Stokes Croft / City Rd / Jamaica St, Baldwin St / Marsh St, York Rd / St Luke's Rd (improving Bath Bridges and Temple Circus), Wells Rd / St John's Lane, Parson St	Improveme nts to junction 'hot-spots' including M32 Jc3, West Town / A4 Bath Rd, Jacobs Wells Rd, Sussex Place / Lower Ashley Rd, Showcase Corridor - A420 (Old Market Rbt to Summerhill Rd / Cloudshill Rd), Cabot Circus, Stokes Croft / City Rd / Jamaica St, Baldwin St / Marsh St, York Rd / St Luke's Rd (improving Bath Bridges and Temple Circus), Wells Rd / St John's Lane, Parson St	Further junction and road improveme nts carried out as part of GBBN project completed March 2012 along key route corridor roads.	Improveme nts to junction 'hot-spots' ongoing. Further junction and road improveme nts carried out as part of GBBN project completed March 2012 along key route corridor roads. In 2012/13, B4466 Jacob's Wells Rd/Triangle South Junction remodelled, with new signals and lane arrangeme nts.	Ongoing . No overall assess ment of NOx, but moni toring shows congesti on levels across the AQMA reduced by some 5% since 2006.

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
							works undertak en at hot- spot sites.			Gyratory, Merchant's Rd / Hotwell Rd, and Portway / Bridge Valley Rd	Gyratory, Merchant's Rd / Hotwell Rd, and Portway / Bridge Valley Rd			
LTP	Parking policy			PARKING SPECIAL EVENT CONTROLLED PARKING: Draft order in the main agreed, resolving minor issues. [Proposed advertising date September 2004] Bristol Zoo included as a new area for 2003/4. Order advertised one objection received, resolved by officers & decision taken to proceed with sealing of order under delegated powers. Completed February 2004. PARKING	Residual work for the essential refurbishment of concrete columns in Trenchard Street Multi-storey car park, not included in the original contract.	Parking policy is set out in the JLTP to allow converge nce of current policies to give a more consistent approach over our area. SPA status for South Glouceste rshire and North Somerset Councils, extension of controlled parking zones and enforcem ent will be priorities within the								No longer reported .

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11 JLTP.	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				RESTRICTION S REVIEW: Clifton Village: advertising commencing shortly, North St: informal consultations with Ward members now to be funded from 'carry- overs' Studies/design/ planning consent for 1 small site. TRENCHARD STREET: Works for column strengthening commissioned March 2004.										
	LTP+	12 Parking Enforceme nt & Managem ent of Delivery Times	Most key routes are already covered by parking and loading restriction s. Limited program me of targeted enforcem ent. Review of parking restriction			Parking restriction s already cover most roads/key routes in AQMA's. In Bristol, a review of parking restriction s is being undertake n and additional areas may be	Review of Council's parking strategy and enforcem ent program me is underway . Targeted enforcem ent remains a core activity of the	Review of Council's parking strategy and enforcem ent program me is underway . Targeted enforcem ent remains a core activity of the	Review of Council's parking strategy and enforcem ent program me is complete d. Targeted enforcem ent remains a core activity of the	Central Parking Zone extensions and Residents Parking Schemes progressing . Detailed RPZ plans being drawn up, and CPZ extension phase 1 was implemente	Central Parking Zone extensions and Residents Parking Schemes progressing . Detailed RPZ plans being drawn up, and CPZ extension phase 1 was implemente	Consultatio n carried out on two Pilot areas. Kingsdown RPZ reproduced in January 2011. Kingsdown RPZ implemente d January 2011. Consultatio n on further RPZ's now underway.	Central Parking Zone extensions and Residents Parking Schemes progressing . First RPS areas operational around CPZ, and CPZ extensions by 2010. RPS' now	Ongoing

	AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progress
		<p>s underway . Additional enforcement of parking and loading restrictions on key routes in the city. Discuss delivery management with freight quality partnership.</p>			<p>added where appropriate. Enforcement is already targeted on major routes to prevent illegally parked vehicles from causing congestion. Enforcement measures will be crucial in support of the Bus Network Major Scheme.</p>	<p>Council's parking management strategy and Showcase bus route programme.</p>	<p>Council's parking management strategy and Showcase bus route programme. A significant number of older vehicles have been removed from the roads and scrapped as a result of the Council's tow-away scheme.</p>	<p>Council's parking management strategy and Showcase bus route programme. Plans to introduce extensive Controlled Parking Zones are being drawn up. A significant number of older vehicles have been removed from the roads and scrapped as a result of the Council's tow-away scheme.</p>	<p>d August/September 2009, phase 2 planned for 2010. Consultation carried out on two Pilot areas Statutory consultation now to be progressed on one of these (Kingsdown RPZ)</p>	<p>d August/September 2009, phase 2 planned for 2010. Consultation carried out on two Pilot areas. Kingsdown RPZ reproduced in January 2011.</p>		<p>operational include Kingsdown, Cotham and Redcliffe, with St Phillips &amp; Easton as well as St Pauls out for consultation. Consultation on further RPS areas including St Phillips and Easton and St Pauls underway. Redcliffe RPS implemented 1 November 2012 and Cotham RPS implemented December 2012. The Mayor has now published plans for further RPS areas around central</p>	

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
												Bristol.	
LTP	New Roads/ Road improveme nts		Avonmouth Rd – Environmental enhancement scheme, tree planting (partially grant funded). Straits Parade – Junction narrowing and pedestrian refuge. Spartley Walk – parking improvements, narrow estate road A variety of minor lining and signing projects were completed throughout the city. Works were carried out at the following	M32 Park and Ride Site appraisal, access and demand assessment complete. A37 Park and Ride Whitchurch bypass study jointly with Bath & North East Somerset Council completed October 2004. Close involvement as a key stakeholder with the Greater Bristol Strategic Transport Study (GBSTS), including contribution funding. GBSTS continuing to end of 2005.	Greater Bristol Strategic Transport Study findings reported on various highway improvements across the joint LTP area. These will be assessed in more detail, and progressed as appropriate, during the JLTP period.							No longer reported	

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			locations in association with developments: IKEA Cribbs Causeway Sandburrows Road Channons Hill Next Generation Innox Gardens Sainsburys Castle Court Winterstoke Road Bus Depot South Bristol Business Park Brigstowe Hotel	New 'Accession' software acquired and in use for development of policy and projects in support of accessibility modelling for the second LTP. New city centre micro-model completed, and currently in use to access various highway proposals. As last year, much of the traffic engineering work carried out in 04/05 was in conjunction with Road Safety, Safer Routes to School, Showcase, Cycling and other programmes. Hill Avenue-design work carried out only. Murford Avenue – completed Calcott Road / Bayham Road – completed St Agnes and									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				StWerburghs- design work completed Bellevue Road - completed Cherry Lane – Pedestrian improvements 3 Redcliffe Street - Pedestrian improvements UWE site, Redland Hill – Pedestrian improvements Dingles redevelopment – Pedestrian improvements St Paul's Learning Centre – Pedestrian improvements Queen's Building, Bristol Uni – Pedestrian improvements Axiom development – Pedestrian and Cycle improvements Whitefield Road / Wirefield Avenue – Safety scheme and Pedestrian improvements Blackberry Hill – Safety scheme and Pedestrian									



	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				improvements									
New	13a Stronger enforceme nt of current motorway speed limits	Prelimin ary evaluatio n undertak e, further evaluatio n required. Undertak e air quality modelling to assess impacts of speed managem ent			Close working with Highways Agency / Police regarding options for speed managem ent, particularl y on urban motorway s.	Further work is required to model the impacts of M5 speed limit changes prior to initiating talks with the Highways Agency. M32 depende	Further work is required to model the impacts of M5 speed limit changes prior to initiating talks with the Highways Agency. M32 speed	Speed limits to be reduced on southern end of M32 as part of bus lane scheme (see below). More extensive speed limit reduction	Reduced speed limits on M32, Planned Managed Motorway on M5/M4 around Bristol project by Highways Agency	Reduced speed limits on M32, Planned Managed Motorway on M5/M4 around Bristol project by Highways Agency	Reduced speed limits on M32, Planned Managed Motorway on M5/M4 around Bristol project by Highways Agency	Reduced speed limits on M32, Managed Motorway on M5/M4 around Bristol currently underway, project under Highways Agency, completion estimated 2014.	Ongoing

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s	
			options. Discuss speed managem ent options with the Highways Agency and Police.				nt on other potential schemes (see below).	limits to be reduced (see below).	s likely if further bus lanes are introduce d as part of M32 Park & Ride. Following detailed monitorin g and modelling it is proposed to remove the AQMA designati on alongside the M5 at Avonmou th.						
	New	13b Reduced Motorway speed limits in AQMA's	Undertak e further assessme nt. Discuss options for managing speed with Highways Agency / Police. Cost depends on enforcem ent options. A blanket speed limit would be cheaper to implemen t and												

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			enforce than a variable one.											
	New (LTP)	14 M32 Managem ent	De- trunking negations underway with Highways Agency. Preliminar y lane use study undertake n. De- trunk M32. Undertak e detailed study of managem ent options and priority measures (including air quality assessme nt). Submit planning applicatio n for Park & Ride				Initial discussio ns with Highways Agency have been held as part of LTP2 Major Scheme Public Transport bid. Further progress depende nt on successf ul outcome of this bid and continuin g negotiat ions relating to the detrunkin g of the M32.	Proposal s for a new 1250m bus lane and reduced speed limits through junction 3 of the M32 are included in the Greater Bristol Bus Network bid. The scheme The lane will deliver substanti al benefits to bus passenge rs on this congeste d section	Proposal s for a new 1250m bus lane and reduced speed limits through junction 3 of the M32 are awaiting final completi on of Greater Bristol Bus Network funding agreeme nts with DfT. The scheme is schedule d to commenc e in July 2008 and	M32 bus lane and reduced speed limits through Junction 3 completed.	M32 bus lane and reduced speed limits through Junction 3 completed.	M32 bus lane and reduced speed limits through Junction 3 completed.	M32 bus lane and reduced speed limits through Junction 3 completed.	Comple ted Septem ber 2008

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		site. Implemen t corridor managem ent scheme.					of the M32 which serves central Bristol. Further bus priority measures , speed manage ment measures and Park & Ride on this corridor are being considere d. Further measures may be depende nt on the outcome of negotiatio ns with the Highways Agency regarding the detrunkin g of the M32.	will deliver substanti al benefits to bus passenge rs on this congeste d section of the M32 which serves central Bristol. Further bus priority measures , speed manage ment measures and Park & Ride on this corridor are being considere d. Further measures will be depende nt on the cooperati on of the Highways Agency who is responsib le for the					

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
								manage ment of this Motorway .					

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s	
	New	15 Freight trans- shipment centres	Pilot logistic scheme being progresse d through VIVALDI project (target 30 retailers). Review outcomes of VIVALDI trans- shipment centre pilot. Discuss with Freight Quality partnershi p. Undertak e feasibility study.	Freight consolidation scheme developed in consultation with Broadmead Board, Business West and other stakeholders.		Demand managem ent measures – delivery managem ent strategy: Working with Freight Quality Partnersh ip, Councils will help to identify and resolve local problems. Within the AQMA's, studies underway to evaluate pattern of HGV and local delivery vehicle movemen ts. Freight consolidat ion centre considere d successfu l and best practice to be	Pilot urban trans- shipment scheme continuin g as part of the VIVALDI project. Over 50 retailers in central Bristol are participati ng in the project to assess the feasibility of the trans- shipment concept. Initial results have shown a 70% reduction in freight movemen ts [around 75,000 km] among participati ng retailers. Potential	The Bristol freight consolida tion centre serving the central Broadme ad shopping area continues to be supporte d by the Council. The scheme has expanded with 58 companie s now participati ng. Delivery vehicles movemen ts among participati ng firms have been reduced by 73% saving over 130,000 lorry kilometre	The Bristol freight consolida tion scheme now serves 63 retailers in central Bristol and will be integrate d in to the new £500m shopping centre Cabot Circus) from Septemb er 2008. Delivery vehicles movemen ts among participati ng firms have been reduced by 73% Consolid ation vehicles are also to be granted permissio n to use	Freight Consolidati on Centre now serving 63 retailers in central Bristol and will be integrate d in to the new £500m shopping centre Cabot Circus) from Septemb er 2008. Delivery vehicles movemen ts among participati ng firms have been reduced by 73% Consolid ation vehicles are also to be granted permissio n to use	Freight Consolidati on Centre now serving Cabot Circus as well as Broadmead retail area. Centre to be expanded to serve other areas such as Bath City Centre. Ongoing (Bristol scheme due to be completed in 2010, as new scheme serving Bristol and Bath begins operations)	Freight Consolidati on Centre now serving Cabot Circus and Broadmead retail centre) and Bath City Centre. New scheme serving Bristol and Bath commence d operations January 2011 with contract continuing for 2012.	New scheme serving Bristol and Bath commence d operations January 2011 with contract continuing for 2012.	Freight Consolidati on Centre now serving businesses across Bristol (including Cabot Circus, Cribbs Causeway, central and suburban areas) as well as in Bath and places in between. Scheme serving Bristol and Bath ongoing since January 2011 with contract extended to end of 2013. Currently serving over 100 retail outlets and businesses in Bristol, Bath and several places in	Ongoing . Overall the scheme in Bristol has reduced freight moveme nts by 380,000 km leading to a reductio n in NOX emissio ns of 3,300kg and 100kg of PM10's so far.

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11 shared with other areas.	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
						air quality benefits not yet establis hed.	s.	the inbound bus lane on the A4 Portway. A 9 tonne electric delivery vehicle was successf ully trialled in 2007 and it is anticipate d that a similar electric truck will be introduce d for full time operation in late 2008.				between.	

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
Emissions Management	New	16 Reduce emissions from poorly driven vehicles	A number of initiatives are being developed. Initiatives covered under encouragement and education, and managing the road network chapters. (measures 8,9 &10) Investigate using parking attendants to enforce idling vehicles legislation.			Enforce law against idling vehicles: Promotion as part of 'Switch Off' campaign. Examine use of parking attendants to enforce idling legislation. Focus on locations where vehicles are known to idle e.g. outside schools, taxi ranks etc.	Continued promotion of better driving through 'Drive Down Pollution' leaflet and development of eco-driving materials and training in Easton PTP project (see action 4 above).	Continued promotion of better driving through new 'Cut your car costs' information and an eco-driving courses which are being piloted with 100 drivers. Eco-driver training in Europe has resulted in an average 15% improvement in fuel consumption (and reduced emissions). 100 Council van drivers have taken the Safe &	Continued promotion of better driving through 'Cut your car costs' information and eco-driving courses. Pilot project resulted in an average 7% improvement in fuel consumption. A second phase of eco-driver training and monitoring are currently underway. Eco-driving materials are included in the Council's Personal					Ongoing under other measures.



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
								Efficient Driving course in 2006 which is estimated to reduce fuel consump tion by 10%. Eco- driving materials now mainstrea med into the Council's Personali sed Travel Planning projects.	sed Travel Planning projects. (See also lorry driver training – no. 24 below)					
	New	17 Vehicle maintenan ce- Roadside Emissions Testing	Trial undertake n and permanen t scheme being develope d. Implem ent roadside emissions testing program me and free testing at supermar kets and			Pilot undertake n in 1999. Options for permanen t voluntary testing scheme to be investigat ed.	Potential costs of implemen ting a scheme have been investigat ed.	Pilot of vehicle pollution sensing equipmen t (combinin g measure ment of exhaust gases and number plate recognitio n) to detect	Pilots of vehicle pollution sensing equipmen t to detect and identify grossly polluting vehicles in motion were undertak en on major traffic routes in					Trial not continue d.

		AQAP1 April 2004	Initial status/ac tion other locations.	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
								and identify grossly polluting vehicles whilst they are in motion was undertak en on major traffic routes in 2006. Pilot is currently being evaluated . Around 450 advisory letters were sent to drivers of grossly polluting vehicles.	2006 and 2007. The pilots revealed that there are a number of technical issues than need to be resolved before it can be widely utilised.					
	New	18 Encourage ment of more efficient vehicles.	Currently being evaluated . Promote 'cleaner vehicle' buyers informatio n and encourag e buying of smaller, less				Promotio n strategy not yet develope d. Initiatives for new vehicle purchase s will build on the new environm ental	Advice on vehicle choice is included in the Council's eco- driving booklets and driver training program me. A	Advice on vehicle choice is included in the Council's ecodrivin g booklets and driver training and personali					Not continue d.

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			polluting and more efficient vehicles. Lobby governme nt for a more environm entally beneficial vehicle taxation system. Investigat e the environm ental performa nce of PTWs				labelling scheme for new cars.	wider promotio n strategy has not yet develope d. Initiatives for new vehicle purchase s will build on the new environm ental labelling scheme for new cars.	sed travel planning program mes. A wider promotio n strategy has not yet been develope d. Initiatives for new vehicle purchase s will build on the new environm ental labelling scheme for new cars.					

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	LTP+	19 Promote / pilot alternative vehicles / fuels.	Commitment to LPG and alternative fuelled vehicles in Council Fleet. Undertaken trials of alternative vehicle technology. Continue to promote alternative fuels and government grants for cleaner vehicles. Continue with the expansion of Council's LPG fleet. Continue trialling alternative technologies (including further electric vehicles			In the two AQMA's national schemes and incentives will be promoted. Continued expansion of existing Council 'green' fleets and promotion in other fleets. Promote the wider availability of cleaner fuels. Replacement of Council fleet with 'greener' types of vehicle: Continue programmes to replace Council fleets with less polluting vehicles.	Continued expansion of council's alternative fuel fleet which now totals over 100 LPG vehicles and 7 electric and hybrid vehicles. A diesel-electric hybrid bus entered in to service on the 500 bus route in the heart of the AQMA but has experienced extensive technical problems. Established a Clean Vehicle	Bristol maintains a large fleet of alternative fuel vehicles, which totals over 100 LPG, electric and hybrid vehicles. Further fleet initiatives are awaiting the outcome of a fleet audit and development of a new fleet procurement strategy.	Bristol City Council maintains a large fleet of alternative fuel vehicles, which totals over 100 LPG and hybrid vehicles. New fuels / technologies will be evaluated when they become viable.	New vehicles added to fleet over 2008/09 include 4 low emission cars producing under 100g/km CO2, and 4 LPG/Petrol cars.	New vehicles added to fleet over 2009/10 include 2 low emission cars producing under 100g/km CO2 and 4 previously in 2008/9.	4 new cars and 10 new vans purchased all in compliance with European Commission criteria producing well below the 130g CO2/km limit for cars and 175g CO2/km for vans.	New cars and vans being added annually to the Council fleet is increasing the total percentage of our on road fleet as low or ultra-low emission vehicles. 5 new cars producing less than 100g CO2/km and 1 new van purchased producing only 112g CO2/km well below the EU 130g CO2/km limit for cars and 175g CO2/km for vans.	Ongoing

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		and hybrid buses). Monitor developments in cleaner fuel and vehicle technology and trial / promote these technologies where appropriate. Lobby Government to do more to promote / incentivise cleaner technology at national level, based on wider environmental factors, taking in to account local pollution and not just CO2 benefits.				Support Network assisting taxis, local businesses, council employees and the public to convert to alternative fuels. Resulted in 50 LPG conversions.							

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progress
	LTP+	20 Advice / incentives for 'cleaning up' large vehicles	Pilot voluntary schemes undertake n with bus and freight operators. Negations for further program mes underway . Retrofit all conventio nally fuelled buses operating in Bristol with particulat e filters and ultimately de-NOx systems. Promote voluntary retrofitting of freight vehicles. Lobby Governm ent for stronger incentives for de- NOx systems and for			Pilot retrofitting program mes for buses and HGVs undertake n through LTP and VIVALDI project utilising Energy Savings Trust funding. Plans to extend retrofitting across whole bus fleet, and HGVs and smaller delivery vehicles. Examine feasibility of cleaning up other vehicles e.g. taxis.	No further vehicles fitted with pollution reduction devices owing to suspensi on of Energy Savings Trust grant funding and uncertaint ies surroundi ng the future of the scheme.	No further vehicles fitted with pollution reduction devices owing to terminatio n of the Energy Savings Trust grant funding and concerns over particulat e filters resulting in an increase in direct NO2 emission s.	No further vehicles fitted with pollution reduction devices owing to terminatio n of the Energy Savings Trust grant funding, reliability issues reported by operators and concerns over particulat e filters resulting in an increase in direct NO2 emission s.					Disconti nued due to funding terminati on and technica l issues.

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		retrofitting smaller HGVs.											
New	21 Retrofitting Smaller Vehicles	Evaluatio n of age profile of vehicle fleet underway . Discuss potential schemes with Taxi organisati ons. Investigat e options for retrofitting smaller vehicles. Lobby Governm ent to undertake pilot retrofitting scheme for cars. Examine cost of cleanup program me in more detail (part of LEZ study - Measure 2).				No additional AQAP measures introduce d.	LES study calculat ed that this action was not cost- effective. The vast majority of Pre- Euro vehicles have already been scrapped and more recent vehicles are technicall y more difficult and costly to retrofit.	Low Emission s Strategy study calculat ed that this action was not cost- effective. More than 97% of Pre- Euro vehicles have already been scrapped and more recent vehicles are technicall y more difficult and costly to retrofit.					Not cost- effective

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	New	22 Scrappage Incentives	Pilot scheme being examined . The Council is currently examinin g details of how a pilot would work in practice including safeguard s to prevent abuse of the scheme Lobby Governm ent to provide incentives for vehicle scrappag e and undertake a pilot scheme in Bristol.				No AQAP measures introduce d.	LES study showed some benefits from scrappag e schemes if coupled with an annual bus pass (i.e. if cars are not replaced with other cars).	A significan t increase in vehicle scrappag e rates has occurred as a result of removing untaxed vehicles through more targeted parking enforcem ent and police activity. Less than 3% of cars on the roads are pre- Euro 1 compare d with 30% 5 years ago	National Scrappage scheme carried out - no local scheme necessary. The impact of the national scheme locally will be assessed when data is available. National Scrappage scheme extended due to scheme success and benefit to recession hit car industry and replacemen t of older vehicles with newer less polluting vehicles.	National Scrappage scheme carried out - no local scheme necessary. The impact of the national scheme locally will be assessed when data is available.	National Scrappage scheme carried out - no local scheme necessary. The impact of the national scheme locally will be assessed when data is available.	National Scrappage scheme carried out - no local scheme necessary. The impact of the national scheme locally will be assessed when data is available.	Local scheme unneces sary.



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	New	23 Bus Emissions Regulation (emissions standards in contracts)	Minimum emissions standards for buses are being introduce d in supported services contracts. Introduce emissions standards into all contracts and monitor effectiven ess. Lobby Governm ent to introduce national emissions standard for buses operating in cities with AMQAs			Minimum emissions standards included in supported services contracts at Bristol City Council. First are introduc ing a new bus fleet in Bath and Bristol if the major scheme bids are successfu l. The Councils are also investigat ing the use of new powers granted to the Traffic Commissi oner to enable emissions standards to be imposed through Traffic Regulatio	Assessm ent of options to clean up bus fleet being assessed as part of LES strategy study (see action 25 below), which may result in a formal approach to the Traffic Commissi oner regarding the use of new powers to regulate emission s from buses. Minimum emission s standards were not included in supporte d services contracts	Actions to clean up bus fleet were the most cost effective measure in the LES strategy study (see action 25 below). Strategy to clean up buses is currently being considere d and may result in a formal approach to the Traffic Commissi oner regarding the use of new powers to regulate emission s from buses. GBBN, Showcas e 2 and other	Actions to clean up the bus fleet were the most cost effective measure in the Low Emission s Strategy study (see action 25 below). A strategy to clean up buses is still being considere d and may result in a formal approach to the Traffic Commissi oner regarding the use of new powers to regulate emission s from buses. GBBN, Showcas	370 of city buses fitted with GPS tracking. 16 new buses upgraded from Euro 4 to Euro 5 through work with the majority bus operator.	377 of city buses fitted with GPS tracking. 16 buses upgraded from Euro 4 to Euro 5 through work with the majority bus operator, now currently running 34 Euro 5 buses.	42% of Bristol buses now have Euro IV / V engines. Governmen t Green Bus fund has resulted in new low emission buses being provided.	All city buses now fitted with GPS tracking. 16 buses previously upgraded from Euro IV to Euro V through work with the majority bus operator. Continuing work by local authorities with bus operators to upgrade fleets to Euro V. Approximat ely 50% of Bristol buses now have Euro IV / V engines. BCC working with First Group to upgrade a further 20 vehicles from Euro IV to Euro V.	Ongoing . It is predicte d that the conversi on of 16 buses from Euro IV to Euro V should save almost 2 tonnes of NOx per year.

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
						Condition s. Other options such as the use of TROs and Low Emission Zones are also being considere d.	as planned owing to the significan t increase in revenue support this would have entailed.	matched investme nt will result in a significan t modernis ation of the bus fleet in Bristol over the next few years.	e 2 and other matched investme nt will result in a significan t modernis ation of the bus fleet in Bristol over the next few years.					
	New	24 Promote and assist freight emissions agreement s	Freight Quality Partnersh ip (FQP) establishe d. Pilot freight retrofitting scheme undertake n with local firm. Undertake assessment of compositi on of local HGV fleet. Discuss setting of minimum emissions standards with FQP.	Surveys and studies in support of the Freight Quality Partnership	Several meetings of the Freight Quality Partnership (FQP) for Bristol and neighbouring authorities were held in 2004/2005 and a priority work programme agreed. Work has begun to produce a revised/updated Commercial Vehicle Drivers' Atlas following the success of the pilot published in March 2003; a review of lorry parking with the aim of producing	Discuss potential agreemen ts with freight organisati ons and begin retrofitting program me for older vehicles. Assistanc e to be offered to retrofit vehicles (Energy Savings Trust, & vehicle tax rebates). Work will be	Potential for freight agreeme nts was considere d as part of the LES strategy study (see action 25 below), and was deemed to be reasonabl y cost effective but take up rates for a voluntary scheme would be very low.	Potential for freight agreeme nts is being considere d as part of the LES strategy study (see action 25 below)						Not continue d.

		AQAP1 April 2004	Initial status/action	LTP PR 2004	LTP PR 2005	JLTP2 2006/7-2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progresses
			Extend voluntary retrofitting programme.		a strategy and set of proposal for improved lorry parking facilities in the FQP area; and a wider review of freight movement survey information. However, no funding was allocated for FQP studies to prepare this work during 2004/05.	progressed though Freight Quality Partnerships during the LTP period.			Efficient Driving training (SAFED) being delivered by the Council as part of the EU supported START Project.					
	New	25 Low Emission Zone (LEZ) Study Possible Scheme	Preliminary assessment of LEZ impacts undertaken. Undertake LEZ feasibility study. Lobby Government to introduce national 'Clean up' scheme for cities with AQMAs.			Feasibility study will be undertaken.	Feasibility study examining a range of potential Low Emission Strategy measures is underway. The study will include an assessment of several options including an LEZ, scrappage	Feasibility study examining a range of potential Low Emission Strategy measures completed. The study recommended bus emissions management measures as the most cost-effective	As reported in 2007 Low Emission Strategy feasibility study concluded that the costs of setting up and running an LEZ would be prohibitive but these costs could be potentially reduced if	LEZ proposals not continued with, however work with the local bus operator has led to the upgrade of 16 buses in the local fleet from Euro4 to Euro5 standards. Potential to re-explore as part of possible Urban Challenge	LEZ proposals not continued with, however work with the local bus operator has led to the upgrade of 16 buses in the local fleet from Euro4 to Euro5 standards.	LEZ proposals not continued with, however work with the local bus operator has led to the upgrade of 16 buses in the local fleet from Euro4 to Euro5 standards. Further new lower emission buses have been	LEZ proposals not continued with, however work with the local bus operator has led to the upgrade of 16 buses in the local fleet from Euro4 to Euro5 standards.	BCC will commission an update of the 2006 Low Emissions Strategy Study, to review the cost – effectiveness of various Low Emissions strategies, including

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
							schemes, voluntary retrofitting and the use of the traffic commissioner's emissions regulation powers. Study due to report at the end of June 2006.	method of reducing NOx emissions in Bristol. The costs of setting up and running an LEZ would be prohibitive but these costs could be potentially be reduced if linked to other infrastructure (e.g. congestion charging)	linked to other infrastructure (e.g. congestion charging). The study recommended bus emissions management measures as the most cost-effective method of reducing NOx emissions in Bristol.	Fund. Bid in the West of England Area.		provided within operator fleets such as through the Green Bus Fund. BCC working with First Group to upgrade a further 20 vehicles from Euro IV to Euro V.	g Low Emissions Zones and recommend short and medium-term delivery options for the Mayor's Air Quality Strategy.	
LTP+	26 Road User Charging (RUC)	RUC scheme for central Bristol being drawn up including assessment of impact on air quality. Examine and					Successful bid for Transport Innovation Fund development funding (£1.5m) to investigate restraint measures	Development work on a possible Transport Innovation Fund (TIF) package incorporating a congestion charging	Development work on a Transport Innovation Fund (TIF) package incorporating a congestion charging scheme					No longer reported.

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			evaluate possible enhancements to the RUC scheme to improve air quality.				and public transport alternatives.	scheme with the associated complementary measures (including Bus Rapid Transit) has been progressed rapidly during the last year.	with associated complementary measures (including Bus Rapid Transit) has continued during 2007 and the Outline Business Case will be submitted to DfT in Summer 2008.					
	New (LTP)	27 Clear Zone	Draft Clear Zone Strategy for central Bristol was produced in July 2003. Some measures already being piloted and progressed. Implemen			Experimental scheme introduced in 2001 in Bath – installation of Northgate Priority Access Point, and made permanent September 2002. Future developm	Clear Zone currently not funded.	Clear Zone no longer being progressed.						Clear Zone no longer being progressed.

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		<p>t measures outlined in Clear Zones strategy. Incorporat e AQAP into Clear Zone and produce revised Clear Zones Strategy.</p>			<p>ents to include further pedestria n enhance ments, a delivery strategy and a revised parking managem ent strategy. Draft Clear Zones strategy for Central Bristol produced in July 2003. Pilot projects underway through the EU- supported VIVALDI project.</p>								

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		Bus NOx emissions Reduction										£60,000 funding has been received from DEFRA to reconfigure the engine managem ent software on Euro IV buses to bring them up to Euro V standard. The major partner in the project is First Group Bristol, Bath and the South West. The project aims to make sure that reconfigur ed buses are used within the AQMA to maximise the impacts of the project.	20 vehicles to be upgraded from Euro IV to Euro V, planned completion by end of May 2013.	Comple ted, further project ongoing. An applicati on is going to be made for further funds to retrofit the bus fleet in Bristol in order to improve emissio ns from busses operatin g within the AQMA.
Transport	LTP	Land use planning				Include Air Quality considera tions in								

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11 planning decisions.	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	LTP	Rail Freight												
	LTP	Maritime – Ports												
	LTP	Maritime Inland Waterways												
	LTP	Airport - Surface Strategy												
Industrial		Local abatement				Several 'Part A' emitters of NOx. All of which have tall stacks and are located in uninhabit ed areas. Recent closure of major polluter has improved air quality in Avonmout h.								



		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
		Emission reduction				Authorisat ion requires operators to limit the emissions from processe s in accordan ce with the UK air quality objectives and EU Limit Values, with a general obligation to use the "best available technique s" to prevent or minimise pollution.								
Domestic		Energy conservati on				Promote and incentivis e energy efficiency in new and existing buildings.								

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
	Smoke control				Enforced under the Clean Air Acts to ensure only authorise d fuels are used in Smoke Control Areas.								
	Nuisance policy (bonfires)				Where a statutory nuisance exists, Councils have a duty to take enforcem ent action requiring the abatement of the nuisance. The Councils will continue to investigat e nuisance complaint s and monitor air quality relative to the Local Air								

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11 Quality Strategy.	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
EUROPEAN TRANSPORT INITIATIVES	LTP													
				VIVALDI: Implementation of VIVALDI project measures including progression of elements under the 8 key project themes. Works for 2003/04 include the development of the Dings Home Zone, clean vehicle initiatives, launch of parking/Park & Ride smartcard, Travelsmart campaign phase 2 in Hartcliffe, completion of the internet trip planner, development of transport telematics and freight systems.	Work has progressed on the implementation of the 36 measures which comprise the VIVALDI project in partnership with Bristol Dial- a-Ride, First Group, Sustrans and the University of the West of England. The project attracts funding from the European Commission and is co-ordinated by the Council working with four other European partner cities. Key achievements in 2004/05 include:- - Construction of 3 streets within the Dings Home Zone completed, with the participation of residents and stakeholders engendered by community travel workers.								No longer reported	

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				<ul style="list-style-type: none"> <li>- Planning and development of materials for TravelSmart campaign in Southville/Windmill Hill (5,000 people) with Sustrans assisted by First.</li> <li>- Broadmead freight consolidation scheme launched in May 2004 with progressive growth to serve 46 city centre retailers by year end.</li> <li>- Supporting the broader use of clean vehicles including the introduction of a hybrid petrol-electric car in the Council fleet and fitting exhaust treatment equipment on 27 buses in the First Somerset and Avon fleet.</li> <li>- Installation of on-bus equipment and back office system for Park &amp; Ride smartcard</li> </ul>									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s	
				<p>scheme completed and testing in progress.</p> <ul style="list-style-type: none"> <li>- Bus lane enforcement trial commenced at two sites using ANPR technology.</li> <li>- Taxi sharing scheme launched in the Barton Hill, St Philip's and St Anne's area to provide access to local services and links to the broader public transport network.</li> <li>- Home shopping trial commenced in December providing low technology equipment for housebound people to improve independence whilst reducing car travel by carers.</li> <li>- Five Variable Message Signs commissioned to be sited at the Portway Park &amp; Ride site and at</li> </ul>										

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
LTP				key decision making points on the road network.									
			PROGRESS DEMONSTRA TION PROJECT: The PROGRESS demonstration will be undertaken this year in co- operation with the DfT through the DIRECTS research programme. This will trial GPS equipment on volunteer commercial vehicles and electronic enforcement technology. This will be evaluated by consultants through the project as part of the activities for this year. This work is closely associated with the ongoing investigation of RUC in the	Support has also been provided for a number of other schemes separately detailed including the expansion of the Bristol Car Club, the introduction of a hybrid diesel-electric bus on the 500 city centre orbital route, and the creation of the TravelBristol Info Centre. Bristol co- ordinated the PROGRESS European Commission supported project to demonstrate and evaluate the effectiveness and acceptance of integrated urban transport pricing schemes to achieve transport goals and raise revenue. The 8- city project provided best									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			city. Further work in 2003/4 will ensure the robustness of impact assessment to meet DfT audit requirements, promotion and awareness and development of formal consultation strategy.'	practice examples for policy makers and cities considering implementation of schemes. This included continuation of linkages and input to the national level DfT proposals for future demand management. The European Commission endorsed the work of the project and the project is now completed. Bristol is a partner in a follow-on project (CURACAO) which has just received funding from the European Commission. Demand management measures have been considered as part of the package of measures and strategies developed for the JLTP. As									

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
				part of this development further modelling has been undertaken to assess major scheme proposals for the greater Bristol area. Social inclusion measures were further developed from the strategy developed last year. Working with Art & Power in the community, work has been undertaken to improve and promote accessibility to the arts in Bristol. A second strand of work has been to develop understanding and awareness of accessibility on transport services in particular the Portway Park and Ride.									
Network Managem LTP			AIR QUALITY MANAGEMENT: Preparation and promotion	Full AQAP published April 2004 and being integrated into									No longer reported



	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
			of the Air Quality Action Plan, and implementation of some early measures particularly through joint retrofitting projects with fleet operators, preparatory work for future AQAP measures. 'Centre of Excellence' dissemination role	the Joint Local Transport Plan. Retrofitting - Particulate filters fitted to 27 First in Somerset and Avon buses. Retrofitting - Pilot project fitting EGR De-NOx systems to 6 First in Bristol buses. Retrofitting - Project with South Gloucestershire Bus & Coach postponed owing to problems with EST grant system. Continued expansion of alternative-fuel vehicles within the council fleet. Continued air quality awareness activity. Continued promotion of the 'Switch Off' campaign including 4 new signs outside schools and 2 experimental highway signs. Centre of Excellence -									

		AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
					hosted fourth Air Quality Action planning conference.									
Emissions Management	LTP2					Demand managem ent measures : Being investigat ed through the Transport Innovatio n Fund								No longer reported
	LTP2					Cooperati on with Central Governm ent: Highlight areas where stronger national action can support, or have greater benefits than local air quality measures , e.g. bus emissions regulation , taxation and scrappag e								No longer reported

	AQAP1 April 2004	Initial status/ac tion	LTP PR 2004	LTP PR 2005	JLTP2 2006/7- 2010/11 incentives	USA April 2006	DA 2007	PR April 2008	PR April 2010	PR April 2011	USA April 2012	PR July 2013	Overall progres s
LTP2					Working at regional level: Coordinat ed approach at regional scale through pollution groups, local authority organisati ons and contact with Governm ent Office for the South West and South West Regional Developm ent Agency.								No longer reported

**Appendix 11. Table 3: Leicester AQAP measures and reported annual progress 2004-2011**

	QAAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
Emissions Management	Roadside emissions testing	Roadside emissions testing (statutory and voluntary) - Pollution Group, programme scheduled for 2006/7 and subsequent years. Not self-funding and has to be met from existing resources / policing issues:- Statutory / voluntary emissions testing. Survey of efficacy of voluntary arrangement with Bus Operators to shut off engines when stationary – enforcement programme, if justified.	No progress with exhaust monitoring since statutory and voluntary Vehicle Emissions monitoring campaigns of 2003/4.		Roadside emissions testing	Ongoing
	Campaigns to eliminate old / poorly maintained / illegal vehicles	Campaigns to eliminate old / poorly maintained vehicles - Dependent on outcome of Government study	Licensing Policy adopted by Cabinet, 21-04-08: In 2008/9 taxis to Euro IV standard will receive 50% discount on licensing fee. Euro I taxis will not be licensed after 4/09 and Euro II taxis after 4/11.		Eliminating polluting vehicles	Ongoing
	Campaigns to influence driving style/short journeys	See Information and Education	See Information and Education	See Information and Education	See Information and Education	See Information and Education
	Low Emission Zone	Low Emission Zones - The implementation of LEZ's within the time-frame of the LTP 2006-11 has been considered and rejected for the following reasons: Economic harm to City Centre. Difficulties / costs for local business in adapting procedures, infrastructure and vehicle fleets. Issues with definition: Physical extent, excluded vehicles etc. Issues with enforcement:				Possible Environment Zone (EZ)

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
		Administrative and technological aspects.				
	Managing vehicle size in City centre / Freight hub/node	Control of vehicle size in City centre – Freight Hubs - Ongoing, LTP Air Quality. Voluntary co-operation by operators.	Expect signs to be installed in autumn 2008. We have been actively engaging with operators and businesses for the FQP. However, to gain more members and interest, we are relaunching the FQP to include a website and newsletter.	On track with implementation of Freight Signing Strategy to reduce air pollution and congestion caused by lost lorries. New freight signing to industrial estates that helps reduce "lost mileage".	Our freight strategy has been guided by our successful Leicester and Leicestershire Freight Quality Partnership (FQP) that has been making steady progress since its inception. This has raised awareness of freight issues between members, enabled the councils to understand the practical problems of the operators and enabled a freight signing strategy to be developed and implemented. We have been able to influence the Regional Freight Strategy such that a Regional Freight Group was established in 2006, of which we were members, to deliver support for Freight Quality Partnerships, disseminate best practice and coordinate actions. With the demise of the region and the introduction of the localism agenda, local partnerships such as our FQP will take on key roles.	Ongoing
	Making through/heavy traffic avoid Inner Ring Road	Diverting through / heavy traffic from the Inner Ring Road - Ongoing, LTP Congestion Strategy. Improved signing.	We have discussed Freight Consolidation at our FQP meetings. It has been decided that there is not the commercial viability to warrant a freight consolidation area at this present time.		Diverting through traffic from inner ring road	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	Minimum emission standards for buses (Bus Quality Partnership)	Minimum emission standards for buses - Ongoing (Euro IV introduced at end 2005). Quality Bus Partnership.	Vehicle technology and fuel group set up under the Climate Change Programme Board to evaluate available options. Officer contacts with CENEX consultants have taken place.		Minimum emission standards for buses	Ongoing
	Fleet Purchase favouring low emission vehicles for City Council Fleet	City Council vehicle fleet policy (new procurement and retrofit) - Council EMAS programme (Under periodic review by Environment Unit). Progress will occur naturally with introduction of Euro IV vehicles. Progress with radical options / retrofit of existing vehicles unlikely within LTP 2006 timescale but serious cost implications.	Green Fleet Review' prepared by Energy Saving Trust, November 2007: A comprehensive review of Council and 'grey' fleet, with detailed recommendations. These include piloting of low emissions technology vehicles. Vehicle technology and fuel group set up under the Climate Change Programme Board to evaluate available options, using Green Fleet Review as a basis. Officer contacts with CENEX consultants have taken place. Please see attached table (Annex 2).	On 17th September 2008 Directorate endorsed Leicester City Council's response to the Green Fleet Review of November 2007. This includes the following proposed key actions: <ul style="list-style-type: none"> <li>• Vehicle Replacement Programme: retain current approach while continuing to assess alternatives.</li> <li>• Join Low Carbon Vehicle Procurement Programme (if application accepted).</li> <li>• Driver Training – now in progress.</li> <li>• Environment Network – campaign to cut mileage/fuel use by 5% initially.</li> <li>• Internal Travel Plan – continued development and implementation. This is currently being updated to include the Salary Sacrifice Scheme.</li> </ul>	Council fleet policy	Ongoing
	Partnerships with (and advice for) other fleet operators	Partnerships / advice for other fleet operators - LTP Air Quality. Freight Quality Partnership	Through our participation at the Lower Emissions Strategy Forum, we have been closely monitoring the developments of the London Low Emission Zone (LEZ) and the road haulage industry's response to this. The FQP has considered LEZ's in the context of consolidation schemes. LEZ have not been discussed at our QBP meetings. We have been		Partnerships with other fleet operators	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
			working internally with our fleet managers to review targets and actions relating to the Council's own transport impact.			
	Promotion of alternative fuels	Promotion of alternative fuels - Council EMAS programme (Under periodic review by Environment Unit). City Council can influence by example. 5% biodiesel blend in use in Council vehicles. Pilots with battery vehicles, hybrids and alternative internal combustion fuels undertaken or in progress.	Leicester City Council is participating in the national Low Emission Strategies project set up initially by the LA's awarded Beacon Status in Round 8 for the 'Delivering Better Air Quality' theme. Aim: Using the Planning System to deliver reduced transport emissions. Deliverable: A package of measures tailored to Leicester City Council's requirements. We have considered testing alternative fuels/technologies within the Council fleet. However, this would involve the Council purchasing one - off vehicles which can lead to reliability problems, causing additional work and expense to the council.	City is requiring electric charging points in new large car parks such as John Lewis car park.	Promotion of alternative fuels	Ongoing
Information and Education	See Emissions Management	Campaigns to influence driver behaviour - Pollution Control: Periodic media campaigns associated with other initiatives. Target driving style, speed, short / unnecessary journeys. Emphasise economic benefits to driver.	Two new Road Safety Officers will be employed in July08. The Council is part of the Road Safety Partnership. This has provided leaflets, advertising and education and publicity materials for driver awareness campaigns. Also the Partnership has been involved in driver improvement courses and speed awareness workshops. We have developed and promoted a car sharing website, leicestershare.com. We have been promoting travel plans for the Central Transport Zone and throughout the City by ensuring there are conditions on appropriate planning approvals. Limited resources has hindered the progress of implementing voluntary travel plans.	The Councils have jointly developed 'Leicestershare.com', a free car sharing scheme. Funding expires in 2011 however; we are investigating how we can continue this service post 2011.	Campaigns to influence driver behaviour	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	Real time air quality information	Real time air quality information (VMS) - LTP, Congestion Strategy	The website, <a href="http://www.leicesterequal.co.uk">www.leicesterequal.co.uk</a> , is still live, however we are currently migrating to a new website that will be provided by the City Council. This went live in Autumn 2007 and will be formally launched later in 2008. This website will provide live air quality information as well as further traffic information. Information on Leicester Local Air Quality Databases are published via <a href="http://www.leicester-airweb.co.uk">www.leicester-airweb.co.uk</a> .		Real-time air quality / route information (VMS)	Ongoing
	Improved links between air quality and health issues	Education on air quality and health / sustainability - Pollution Control: Periodic media campaigns associated with other initiatives. City Council / LEP Environment Strategy Climate Change Strategy. Implications for air quality and health: <ul style="list-style-type: none"> <li>• AQMA</li> <li>• Road users.</li> </ul> Sustainability and Climate Change Issues.	We have been encouraging people to cycle to events through publicity (circulated to schools, taxi ranks, cafes) and through using a mobile cycle parking bay. We have been providing cycle training. Public RoW team have been removing barriers to walking and patch walks / audits have identified and rectified any access problems. We have been working with partners in promoting walking at health events (such as step counters). We promote the Walk to School Week by sending out walking information to schools. Information available on air quality are: <a href="http://www.leicesterequal.co.uk">www.leicesterequal.co.uk</a> & <a href="http://www.leicester-airweb.co.uk">www.leicester-airweb.co.uk</a> .		Education on air quality and health / sustainability	Ongoing
	Website as a medium	Website - Air quality data website commissioning in 2005 (Pollution Control). Periodic update of explanatory / educational text focussed on issues.	Comprehensive air quality website: Development commenced in 2006.		Websites	Ongoing
	Target house movers/buyers					
	Promote and reward car free days	Promoting car free days - Periodic campaigns	No progress with measure.		Promoting carfree days	Ongoing
	Mobility management strategy					
	Targeting short					



	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	journeys					
	School curriculum (young people) Breathe Easy	School curriculum and campaigns - 'Breathe Easy' programme in 2005 and beyond.	Programme of work with schools: Collaboration with principal partner, Groundwork (formerly Environ) to promote walking and cycling to school. Mobile pollution monitoring unit comparing air quality in vicinity of schools, during term-time and school holidays.		School campaigns	Ongoing
	Education of Officers/Members					
Land Use Planning	Increase officer/member awareness					
	Input into strategic /area planning guidance (SPGs)	Input to Replacement Local Plan. Some policies rejected by Inspector at end of 2004. Modified CLLP at end of 2005.				
	Pre-application involvement, LRC etc.	Input to LRC / SPG briefs.				
	Development Control procedures: Protocol for AQ assessment where develop adversely affects air quality of development is sensitive to air quality	Improved Development Control procedures for dealing with development in AQMA.				
	Tree planting					
		Impact of development on transport system / Parking provision. All significant developments assessed for transport impact. • Conditions • Legal agreements. Policies for restricting parking provision for new development:- Potential conflicts with regeneration agenda.				

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
Managing the Highway Network	Increase parking restrictions / costs	Parking restrictions / costs - LTP, Congestion Strategy. More effective enforcement via Decriminalised Parking Enforcement	Decriminalised parking enforcement commenced 1st January 2007 covering the city area. We have been enforcing all on-street parking restrictions including limited waiting spaces. Commuter parking is being dealt with through the introduction of additional resident parking schemes. Two new schemes are being introduced in August and September. No action has been taken to date to introduce bus lane enforcement since no significant problem exists in the City. Once the necessary powers are awarded as part of the enforcement of moving traffic offences the enforcement of bus lanes using CCTV cameras will be considered during 2009.		Our city centre parking regimes aim to reduce long stay spaces as a demand management measure. This is to reduce commuter parking and thus car trips made in the peak period. Our policy has been no net increase in off-street parking places in the Central Transport Zone. The on-street charging zone and the areas covered by residents' parking controls have and continue to be expanded. We introduced decriminalized parking enforcement (DPE) over the whole of the city council area on 1st January 2007. There is a mixture of city council and privately owned car parks in Leicester hence the city council doesn't have direct control over car park pricing and control of parking as a really effective demand management tool. Since 2008 we have seen a significant increase in temporary surface level car parks on cleared regeneration sites as a reflection of the recession. This is having a detrimental effect on managing congestion and in particular the use of our park and ride services. The city council is currently (2010) preparing a city centre car parking supplementary planning	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
					document to help address unauthorised temporary car parks and the ensuing detrimental effects on transport services and the wider city economy. Surplus income from the city council's car parking operations is reinvested in transport services such as subsidised bus services.	
Reallocation of road space		Reallocation of road space - LTP, Congestion Strategy. Associated with general improvement in facilities: "Quality Bus Corridors"	Saffron Lane - Phase 1; Pork Pie Island scheme completed in 2007/08 - £170k has been allocated for remaining work to include a crossing, a miniroundabout and monitoring. Abbey Lane - Ravensbridge Drive junction improvements complete in 2007/08. Further commitment of council funding is awaiting approval. Melton Road - Melton Road/Troon Way junction improvement scheme - we are still in discussions for progress into further development. Improvements to the A47 Humberstone Road QBC are being planned for construction commencing 2009. City Centre bus, pedestrian and cycle improvements - From early 2006, Leicester City Council has been working on its 'Streets + Spaces' three year improvement programme to develop the streets and spaces in the city centre. Streets + Spaces include creating a new bus corridor to the north of the city centre; pedestrianising High Street, Clock Tower, Market Place approach the Lanes area and Market Street. Many streets will also be rebuilt to a new high quality standard, using	<ul style="list-style-type: none"> <li>• 2006/07 – B5366 Saffron Lane Quality Bus Corridor (QBC), Phase 1 completed in 2007/08, funding allocated to complete Phase 2 in 2008/09.</li> <li>• 2007/08 – A6 Abbey Lane QBC, part complete, further progress linked to that with other developments.</li> <li>• 2007/08 – A607 Melton Road QBC, currently at preliminary design stage.</li> <li>• Pedestrian Preference Zone completed in September 2008 as part of major regeneration work in city centre, focussed on the development of Highcross Leicester, (extended Shires Shopping Centre); large traffic free area, safe and pollution free</li> </ul>	Reallocation of road space. Quality bus corridors	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
			<p>granite paving, new street furniture and designs which will create clean, uncluttered streets and spaces. The Pedestrian Preference Zone order has been completed and is in operation. Gallowtree Gate, Market Street and Hotel Street have been completed. The next and final stages of the project include: Belvoir Street, Clock Tower / East Gates, High Street, Granby Street, Market Place. This will be completed by September 2008. This work is being carried out to support the huge investment in regeneration and construction, and in conjunction with the development of Highcross Leicester (the extended Shires Shopping Centre); creating a large traffic free area, which will be safe and pollution free - making visiting the city centre a pleasure and complementing the new shopping centre.</p> <p>Aylestone Road - target completion date March 2010, Groby Road - target completion date March 2011.</p>			
	Enforcement of speed limits and access restrictions	Enforcing speed limits / access restrictions - LTP, Safety Strategy. Review of speed limits DfT guidance awaited	The Road Safety Partnership has now implemented Vehicle Activated Signs, the first being installed in March 2008. There has been the implementation of the camera scheme. Full speed limits on A and B roads have yet to be reviewed.		Enforcing speed limits / access restrictions	Ongoing
	Traffic calming / Blocking rat runs	Traffic calming and diverting rat runs - LTP, Safety Strategy. 18 residential distributor roads and 15 areas on current priority list	We have installed nine Vehicle Activated Signs (early 2008) on Local Distributor Roads, based on speeding and accident statistics. This is an experiment for three years and we will be monitoring this data. Three traffic calming schemes are currently at preliminary stages.		Traffic calming / diverting rat runs	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	City centre / other 20 mph zones	City centre and other 20 mph zones - LTP, Congestion Strategy. Review of speed limits DfT guidance awaited	We have delivered a 20mph zones for Imperial Avenue - this is being delivered through the use of traffic calming features as they cannot be enforced by the Police.		City centre and other 20 mph zones	Ongoing
	Pedestrian and cycle priority					
	Signing and route guidance. Variable message signs	Signing and route guidance (VMS) - LTP, Congestion Strategy. Already provided for car parks. Network information to be added	We have been delivering our freight signage strategy. Signage for two industrial estates were completed in 2006 (Braunstone Frith and Gorsehill). Three other industrial areas will be completed Autumn 2008. There have been no resources available for further delivery of VMS.		Signing and route guidance (VMS)	Ongoing
	Parking information (VMS)					
	County and Regional co-ordination					
		Management of congestion from road works and events - LTP-2, Congestion Strategy. Traffic Management Act 2004	There are three groups that manage this measure (which also forms part of the TMA Action Plan). These are: Events Advisory Group - this meets monthly with organisers and stakeholders such as the emergency services to plan events in detail to minimise disruption. This is managed with the support Transport Systems which advise on traffic management and the Area Traffic Control room is used for large events eg Diwali, Caribbean Carnival etc. NRSWA Co-ordination Group - this meets quarterly and discusses the programme of works which includes Council, Utility, Developers and County Council works which may have an effect on the City. Work programmes are agreed to avoid clashes and reduce disruption. Monthly Traffic Management Meetings - these monthly meetings include the bus companies, emergency services		The city council's Traffic Management Section manages the Traffic Urban control centre and "keeps traffic moving", through the council's Network Management Plan, in accordance with the Network Management Duty.	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
			and other agencies discuss traffic management in detail of projects that affect the highway network.			
		Junction improvements - LTP, Congestion Strategy.	We have delivered the Pork Pie scheme as a junction improvement. The Ravensbridge Drive junction was completed in 2007/08. Further work within the remainder of the LTP period include: Deliver Melton Road / Troon Way junction improvement during 2008/09/10. Deliver St Nicholas Place junction improvement 2009 as part of the P&R scheme. Deliver the Aylestone Road / A46 Improvements. The actual improvements are unknown. Deliver the A46 Humberstone Road during 2008/09. This will include 4 major junction improvements. Further work on the Saffron Lane is for a revamped junction with Sturdee Road.		Junction improvements	Ongoing
		Signalling improvements - LTP, Congestion Strategy. Optimise existing SCOOT system. Includes SVD for buses	Equipment purchased for VMS installed at some sites. ITS has been developing to include a further roll out of Star Trak.		Signalling improvements	Ongoing
Promotion and Provision of Alternatives	Leicester West Transport Scheme	Park and ride schemes - LTP, Congestion Strategy: Towards end of period. Development of one further site in lifetime of LTP 2006-11?	Enderby Park and Ride - on schedule to be opened Autumn 2009. 1000 car parking spaces will be provided. Birstall / Glenfield P&R site is currently being developed.	Leicester Park and Ride at Enderby opened in November 2009, Birstall to open November 2010); Glenfield Park and Ride scheme is being progressed, programmed opening 2014.	We have two permanent park and ride sites. The site at Enderby, south-west Leicester, is a 1,000 space car park and 10 minute frequency into and around Leicester city centre. The site at Meynells Gorse, west Leicester, has a 500 space car park and 10 minute frequency into and around Leicester city centre. A third site, with 1,000 spaces and a 10 minute frequency running from Birstall, north of Leicester, is currently under	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
					construction. We are looking at linking the Enderby and Birstall services to improve efficiency of the service, and also to provide a link between the railway station and bus station. There is also a Saturday-only site at County Hall.	
	Improved buses	Improved buses	The QBP is continuing to be used for strategic purposes.	The success of the Quality Bus Partnership between the Councils and the bus companies is shown in good results for several indicators including; bus patronage and satisfaction with local bus services.	Our Central Leicestershire Quality Bus Partnership was established in 1999. The members of the main steering group are Leicester City and Leicestershire County Councils, First Bus, Arriva and Trent Barton. The main steering group meets quarterly and discusses issues which are not commercially sensitive. It is supported by the Bus Operations Group and the Bus Information Strategy Group. In addition to these multi-party meetings, the councils meet the two main operators (First and Arriva) quarterly in bi-lateral meetings at which commercially sensitive issues can be discussed.	Ongoing
	Public transport information (real time)	Public transport information - Ongoing. LTP, Congestion Strategy. Quality Bus Partnership. Continued investment.	Star Trak has continued to be rolled out across the bus network. Star text is still available. Bus stop publicity is still maintained in conjunction with the bus operators. The Central Leicestershire Bus Map has been produced twice to reflect the bus service changes (Sep 06 & Nov 07). Furthermore, additional publicity literature has been provided as bus		Public transport information	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
			stops / routes have changed due to the city centre regeneration works.			
	Subsidised bus fares	Subsidised bus fares - Ongoing. LTP Accessibility Strategy. Concessionary fares; 'Travel Aid' Scheme	Due to pressures on existing budgets, no new / existing routes have been subsidised. Plans for the changes in Concessionary Travel Scheme will ensure that there will be no reduction of the local non statutory concessions.		Subsidised bus fares	Ongoing
		Improved bus facilities and circulation - LTP Congestion Strategy. Quality Bus Partnership. Bus shelters	Improved bus circulation has been developed in conjunction with the City Centre regeneration. A bus lane has been installed in Vaughan Way to improve bus journey time. Bus facilities are being improved. New bus stops installed have increased number of pedestrian facilities. For instance, they are more spacious, bus information is provided (through maps / star trak), and the new city bus stops have been planned so they are more convenient to shoppers. The redevelopment of St. Margaret's bus station has provided better facilities for passengers such as implementation of RTI, Arriva Travel shop and improved toilets. No new shelters were provided in 2007 as all those JC Decaux were obliged to provide have been completed. The City Centre plans show that there will be no conflict with buses and car parking queues and other commercial traffic which will help to improve bus circulation.	Improved bus circulation developed in conjunction with city centre regeneration.	There is a comprehensive bus service by three main companies during the working day Monday to Saturday. This is rather patchy and infrequent in the evenings and on Sundays. The council financially supports a number of noncommercial services. The city centre is very accessible by bus during the morning peak (7:30am to 9:30am) as 87.2% of Leicester's households, without cars, are within 400 metres of a bus stop offering a 30 minute journey time by bus into the centre and, 97.8% have similar access to a bus offering a 45 minute journey time (based on the October 2009 network)	Ongoing
		Commissioning additional bus services - Not yet assigned, LTP Accessibility Strategy. Dependent on new funding streams, e.g. from DPE	There have been no additional commissioning of bus services. We are working with the bus companies to ensure that the City Centre regeneration increases bus patronage.		Commissioning additional bus services	Ongoing



	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
		Off bus ticketing - Late LTP, LTP-2 Congestion Strategy. Via Quality Bus Partnership. Programme driven by roll-out of Quality Bus Corridors.	No progress with this measure.		Off-bus ticketing / zonal fares	Ongoing
		Quality bus contracts - Uncertainty and perceived risk for bus operators. Inadequate scope of existing legislation. Revenue funding costs. Adverse impact on competition (questionable). Adverse service effects from adoption of "lowest cost" bidder. Success of existing Quality Bus Partnership in rolling out package of improvements.				Not implemented
	Electric / guided buses and trams	Electric / guided buses and trams - High infrastructure cost. Significant disruption costs during construction. Unavailability of appropriate corridor widths. Long delivery time. Questionable impact on car usage, from preliminary experience elsewhere.				Reinvestigating feasibility of trams

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	Travel Plans	Travel Planning - Late LTP, LTP Congestion Strategy. Council corporate scheme under development in 2005. Planning process will require for all commercial development. 100% of schools to be covered by 2011. Will contribute 5% reduction in peak commuter travel by 2011	Between 2006-08, the majority of commercial travel plans have been conditioned. 25 Residential travel packs have been conditioned to new sites that provides incentives for sustainable transport. However, there has been little progress achieved in implementing travel plans in deprived areas as this has been concentrated in the Central Transport Zone area. Leicestershare website in partnership with Leicestershire County Council was launched in 2007 to encourage journeys to be made by car share.	There are currently 107 travel plans in Leicester; eight voluntary travel plans.	Travel planning	Ongoing
	Council to encourage and promote home working	Council home working and flexible hours - Development and rollout in progress. Extended flexible hours in some Divisions. Provision of IT equipment for use at home with access to central servers via CITRIX software.	The Council has a homeworking policy provided by the use of Citrix. The Council has adopted a flexible working hours. The Council's Travel Plan was launched in 2008.		Council home working and flexible hours	Ongoing
	Safer routes to school (Breathe Easy)/exclusion zones	Safer routes to school - Ongoing. LTP Safer Roads Strategy. Safety, health and social inclusion benefits.	We have implemented a Safer Routes to School scheme for Caledcote Junior School. Three further schemes are at preliminary stages, which will be delivered through the remainder of the LTP period.		Safer routes to school	Ongoing
	School 'walking buses'					
	School 'yellow bus' scheme					
	Promote/ facilitation cycling	Cycling – promotion and facilitation - Ongoing. LTP Congestion / Accessibility Strategies. Healthy and flexible mode of transport. Campaign of marketing and promotion in LTP-2. Extension of current 60 mile signed cycle route network. Current low	Poster and leaflet campaigns at events have been promoted for instance through the JC Decaux poster spaces at bus stops, schools, bike shops, sport shops and now taxi ranks and coffee shops. We have been encouraging people to cycle to events as a mobile cycle parking bay has been provided for use at larger events. Under the 'Ride Leicester'	81% increase in recorded cycle flows between 2003/04 and 2008/09.	The East Midlands Personal Travel Survey told us that 29% of the 1,045 sample Leicester households had access to a bike while the average journey was 1.9 miles. We have seen an 81% increase in cycling in Leicester since 2004. National census and	Ongoing

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
		<p>numbers cycling mean that a substantial increase will only have a small effect on congestion.</p>	<p>brand, information is cascaded to attendees / groups. We have been encouraging safer riding through the Bikeability scheme (launched 2007) and other training providers. The Bikeability project provides cycling proficiency to schools - delivered training for 1400 pupils in 2007/08. As a result we have secured £97k DfT funding to deliver 2400 pupils in 08/09. City Centre Cycle parking - a redevelopment plan for the Town Hall Bike Park has been completed. Cycling infrastructure / routes being updated - Victoria scheme completed and Western Road Viaduct schemes includes significant improvements for cyclists. Preliminary design route of the Green Ringway has been completed.</p>		<p>school travel plan information data for Leicester suggests a growing popularity of cycling and a significant suppressed demand, particularly amongst young people. There are already more than 60 miles of signed cycle routes across the city which the Cyclists' Touring Club's cycle benchmarking exercise confirmed as being high quality. However, there is a disparity of off-road/quiet route provision between the western and eastern halves of the city: the west side being much better served. A key objective is to complete NCN 77 the 'Green Ringway'. This part-completed orbital route will be finished, either using existing quiet roads or new sections of off-road route. The Green Ringway mirrors the route of the Outer Circle bus route. We have expanded our work with schools, employers and adult training organizations to ensure that new (and returning) cyclists have access to affordable cycle training that meets the new National cycle standards. In 2009/10 we provided cycle training for 1,300 school children and 750 adults.</p>	

	AQAP1 Sept 2004	LTP2 March 2006	LTP2 PR Dec 2008	LTP2 PR Jan 2010	LTP3 March 2011	Overall progress
	Promote/facilitation walking	Walking – promotion and facilitation - Ongoing. LTP Congestion / Accessibility Strategies. Health / Social Inclusion benefits Campaign of marketing and promotion in LTP-2. Walking often an element in longer journeys: Improvement in walking routes/facilities programmed.	The Public Rights of Way (PRoW) improvement plan was approved in Oct 2007. The PRoW team are responding to reports from the general public, therefore this will remove barriers to walking. Patch Walks, Audits and online request forms have resulted in improvements to pedestrian facilities. The Kerbcraft scheme has now ended due to a lack of financial resources. A new pedestrian scheme is currently being developed. The Council have worked with partners to bid for funding opportunities. We have been working with partners in sending out material for health fairs. The Walk to School week is promoted through a poster campaign in City Centre & information packs sent to schools.		Walking is a healthy and important method of getting around, as well as being an element of most other journeys e.g. walking to/from bus stops or car parks. Ensuring well surfaced, lit and signed links to schools, local shops, health care facilities and employment areas – both through footways, crossing points and the networks of public Rights of Way and permissive paths owned by the council – has been a priority over the last two local transport plan periods. Child pedestrian training is provided to school children. Promotional campaigns such as 'Let's Walk Leicester' are run in conjunction with local health campaigns to reduce the number of Leicester residents who are overweight through inactivity.	Ongoing

**Appendix 11. Table 4: Oxford AQAP measures and reported annual progress 2005-2013**

	Draft AQAP July 2005	AQAP1 April 2006	AQAP PR April 2010	AQAP PR June 2011	Draft AQAP2 July 2013	Overall progress
Measures for Reducing Emissions from Buses and HGV's	LEZ (Buses, Coaches & HGV's); LEZ (5.7(a) plus all other vehicles)	Low Emission Zone	During April 2009 the City Council supported by the County Council, declared a Low Emission Zone, based upon a Euro5 Emission Standard to be attained by Public Service Vehicles operating in central Oxford by 2014.	During April 2009 the City Council supported by the County Council, declared a Low Emission Zone, based upon a Euro5 Emission Standard to be attained by Public Service Vehicles operating in central Oxford by 2014.		Bus LEZ to be implemented 2014
	Statutory Engine Switch-Off	Adopt statutory powers to request drivers to switch off vehicle engines	In March 2008 Oxford City Council began to enforce a ban on vehicles keeping their engines running while stationary in the city centre.	In March 2008 Oxford City Council began to enforce a ban on vehicles keeping their engines running while stationary in the city centre.		Complete
	Roadside Testing	Adopt statutory powers for roadside testing of emissions				Not reported
	Bus Quality Partnership: - All buses to Euro 3 - Cross-operator Ticketing	Bus Quality Partnership		Qualifying Agreement in place - Formal agreement that establishes operation of shared services, and reduced bus numbers	July 2011: Cross-operator ticketing introduced, reductions in bus numbers on key routes	Complete
Improving Traffic Management And Reducing Congestion	Bus Gate Enforcement	Bus Gate Enforcement	Bus Gate Enforcement was initiated from February 2007	Bus Gate Enforcement was initiated from February 2007	April 2007: High Street Bus Gate Enforcement (up to 25% reductions in non-bus traffic)	Complete
	Traffic light location and phasing	Improved phasing of traffic lights on bus priority route (BPR) and key radial routes into Oxford				Not reported
	Freight Quality Partnership - All HGV's to Euro 3 - Transhipment Centres	Review of commercial delivery times Freight Quality Partnership			Reducing freight emissions	Ongoing

	Draft AQAP July 2005	AQAP1 April 2006	AQAP PR April 2010	AQAP PR June 2011	Draft AQAP2 July 2013	Overall progress
	Bus Quality Partnership: - All buses to Euro 3 - Cross-operator Ticketing	Bus Quality Partnership. Advanced bus ticketing		The first stage of Transform Oxford was in place during the summer of 2009, the work involved: <ul style="list-style-type: none"> <li>• relocating bus stops from Queen Street to nearby streets</li> <li>• reducing the number of buses passing through Queen Street by around one third</li> <li>• creating more space for pedestrians</li> <li>• resurfacing pavements and the road</li> <li>• replacing street furniture - benches, cycle racks etc</li> </ul> This process has altered the balance of buses on key streets on the bus priority route in central Oxford, with consequent changes to the levels of emissions and resultant air quality on key streets. Notably Queen Street, a busy pedestrian street, has shown a significant decrease, whilst there has been an increase in St Aldate's.	July 2009: Transform Oxford, relocation of bus-stops from Queen Street	Ongoing
	Review of Parking	Review of On-street Parking in Central Oxford				Not reported
Encouraging The Use Of Public Transport	Review of Parking	Review of city centre parking policy				Not reported
		Development of bus priority improvements On radial routes into Oxford				Not reported
		Residents/Controlled parking zones In residential areas				Not reported
	Work Place Travel Plans; School Travel Plans	Travel Plans – School and Workplace In all County Schools; and most major employers				Not reported
AQMA Aimed At Encouraging The Use		A40 Green Road congestion improvements				Not reported
		Intelligent Transport Systems				Not reported
		Thornhill P & R interchange				Not reported
		Marston Rd bus gate				Not reported
		Bus Lane enforcement cameras/radial routes				Not reported

	Draft AQAP July 2005	AQAP1 April 2006	AQAP PR April 2010	AQAP PR June 2011	Draft AQAP2 July 2013	Overall progress
		Kidlington Premium Route public transport enhancement				Not reported
		Eynsham Premium Route (Ph1) public transport enhancement				Not reported
		Real Time Information System for public transport				Not reported
		Rail Stations Development				Not reported
		Oxford Southern approaches bus priority				Not reported
		Oxford – Bicester A34/A41 bus priority and remote P&R				Not reported
	Cycling and Walking	Fairfax Rd/Purcell Rd cycle link				Not reported
	Cycling and Walking	Marston Road cycle measures				Not reported
	Cycling and Walking	Thames towpath cycle route				Not reported
	Cycling and Walking	Headington pedestrian/cycle measures				Not reported
		A40 north of Oxford congestion improvements				Not reported
	Taxi Quality Partnership - All Taxis to Euro 3	Taxi QualityPartnership				Not reported
Other Measures	Cycling and Walking	High Street including pedestrian and safety measures Cycle network improvements including HAMATS programme Fairfax Road cycle link Marston Road cycle improvements Thames Towpath pedestrian/cycle Link The Plain Roundabout cycle safety improvements			August 2009: 20mph zones introduced	Ongoing

	Draft AQAP July 2005	AQAP1 April 2006	AQAP PR April 2010	AQAP PR June 2011	Draft AQAP2 July 2013	Overall progress
Draft AQAP	Car Clubs					Not reported
	High Volume Occupancy					Not reported
	Scrappage schemes					Not reported
	Retro-fitting					Not reported
	Cleaner Fuels				July 2010: First diesel electric hybrid buses introduced in Oxford	New measure
					A city-wide sustainable travel strategy	New measure
					Support for the uptake of low and zero emission vehicles	New measure
					Planning for sustainable transport	New measure
					Managing the Council's transport emissions	New measure



**Appendix 11. Table 5: Sandwell AQAP measures and reported annual progress 2005-2011**

		Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
AQMA 1 – Oldbury	1	Remove receptors by Compulsory purchase order.	The council is to investigate options for removing the receptors through a compulsory purchase order or planning policies.	Oldbury Ringway/Birmingham Road (A457), Oldbury	The council will consider the possible relocation of existing residential properties	The council will consider the possible relocation of existing residential properties	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Not yet implemented
				Oldbury Ringway/Birmingham Road	Red route treatment - Red Route treatment including the control of parking which would ease congestion (predicted 10% reduction) but there is no obvious place to displace residential parking	Red route treatment - Red Route treatment including the control of parking which would ease congestion (predicted 10% reduction) but there is no obvious place to displace residential parking	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Red Route Scheme fully implemented and operational October 2010 – Early 2011. Ongoing monitoring to determine potential improvements in NO2 and PM10 concentrations - Completed and continued monitoring for evaluation	Completed
				Dudley Road East/Roway Lane, Oldbury	Red route improvements	Red route improvements	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Scheme fully implemented in early 2011. Monitoring ongoing to determine improvements in air quality - Completed and continued monitoring for evaluation	Completed
AQMA 2 – Yew Tree	2	Improvements to traffic flow on M6 by implementing a programme to reduce incident response times to 20 mins (from 60mins)	These are actions already being implemented by the Highways Agency.	M5 J12, Oldbury & west Bromwich & M6 J7-J8/M5, Great Barr & Yew Tree	Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week - Completed	Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week - Completed	Incident response times have been reduced to 20 minutes. The impacted is currently being evaluated. There is an anticipated reduction in the background NO2. - Completed and evaluating impact	Incident response times have been reduced to 20 minutes. The impacted is currently being evaluated. There is an anticipated reduction in the background NO2. - Completed and evaluating impact	Completed

Interim draft AQAP February 2005		Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress	
	Implement an improved system of contingency planning for the motorway network to improve traffic flows	Implement an improved system of contingency planning for the motorway network to improve traffic flows - Completed	An improved system of contingency planning for the motorway network has been implemented to improve traffic flows - Completed	The impacted is currently being evaluated. There is an anticipated reduction in the background NO2. - Completed and evaluating impact	The impacted is currently being evaluated. There is an anticipated reduction in the background NO2. - Completed and evaluating impact	Completed	
3	Evaluate the suitability of active traffic management to improve traffic flows on the M6	We will be discussing this option and considering if there are any other potential options with the Highways Agency. These discussions will be held in conjunction with other authorities in the West Midlands who have air quality problems associated with the Motorway network. Any actions would also impact on the other AQMAs.	Evaluate the suitability of active traffic management to improve traffic flows on the M6 - Ongoing	Evaluate the suitability of active traffic management to improve traffic flows on the M6 - Ongoing	Currently awaiting further action and decisions regarding funding from the Highways Agency	Active Traffic Management Junctions 7 and 10 implemented April 2011. Ongoing evaluation of potential air quality Improvements - Completed and monitoring continues	Completed
			A link is planned between the M54 and the M6 / M6 Toll this will relieve congestion on the M6 Junction 8 to 10A.	A link is planned between the M54 and the M6 / M6 Toll this will relieve congestion on the M6 Junction 8 to 10A.	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision of further funding	Not yet implemented
			Ramp metering of junctions (M5 (J1 + 2) and M6 (J11 +16))	Ramp metering of junctions (M5 (J1 + 2) and M6 (J11 +16)) - Trial completed at M5 J1 in 2008 further trials to be carried out	Initial trials have proved inconclusive, further trials have been recommended to evaluate the impact of the scheme. Anticipated reduction in background NO2 to the east of M5 and M6	Initial trials have proved inconclusive, further trials have been recommended to evaluate the impact of the scheme. Anticipated reduction in background NO2 to the east of M5 and M6	Ongoing

Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress	
AQMA 3-6 – Great Barr SW, NW, SE, S	4	Route 51 improvements - these proposals include a package of road improvements and traffic control systems that are predicted to improve the flow of traffic along the A34 in the vicinity of Junction 7 of the M6. It also proposes improvements in the bus service to bring them up to the bus showcase route standards being developed across the West Midlands.	These proposals are being included in the new Local Transport Plan. The improvements in traffic flow are anticipated to improve air quality, we are currently trying to modelled the impact to estimated the potential level of improvement. Also see actions relating to Yew Tree AQMA that will impact on the M6 generally. This is an ongoing LTP commitment.	Route 51 improvements – the council will continue to implement a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards	Route 51 improvements – a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards - Completed	Route 51 improvements have been implemented including red route treatments, road improvements, traffic control systems and bus showcase. Early evaluation of monitoring data indicates a reduction in NO2 levels Further evaluation to be undertaken - Completed and monitoring continuing	Route 51 improvements have been implemented including red route treatments, road improvements, traffic control systems and bus showcase. Early evaluation of monitoring data indicates a reduction in NO2 levels Further evaluation to be undertaken - Completed and monitoring continuing	Completed
				Future Metro Phase 2 – Varsity North	Future Metro Phase 2 – Varsity North	Sandwell Metropolitan Borough Council is currently awaiting a decision dependent of the spending review	Sandwell Metropolitan Borough Council is currently awaiting a decision dependent of the spending review	Not yet implemented
				Bus Showcase	Bus Showcase	Bus showcase scheme has been implemented at Bearwood Road. Evaluation indicates no improvement in NO2 levels. Further actions to be considered.	Bus showcase scheme has been implemented at Bearwood Road. Evaluation indicates no improvement in NO2 levels. Further actions to be considered.	Completed
				Pavement trial – monitor outcome of trial for potential application along Bearwood Road - Ongoing	Photocatalytic Paving – currently suspended due to poor results in the trial carried out by Camden Council - Suspended pending further research	Results of recent trials have proved inconclusive. No clear indication that the investment is justified	Results of recent trials have proved inconclusive. No clear indication that the investment is justified	Not implemented
				Future Metro Phase 2 - Birmingham West Route along Hagley Road West	Future Metro Phase 2 - Birmingham West Route along Hagley Road West	Sandwell Metropolitan Borough Council is currently awaiting a decision dependent of the spending review.	Sandwell Metropolitan Borough Council is currently awaiting a decision dependent of the spending review.	Not yet implemented

Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
			Red route along Hagley Road	Red route along Hagley Road	spending review. Red Route has been implemented at this location. Monitoring currently ongoing to confirm a reduction in NO2 levels	Red Route has been implemented at this location. Monitoring currently ongoing to confirm a reduction in NO2 levels	Completed
			Blackheath Bypass was completed in 2006, the council will implement traffic management scheme to maximise the use of the bypass. As a result of the bypass and Traffic Management proposals a reduction of 40% may be achieved	Blackheath Bypass was completed in 2006, the council will implement traffic management scheme to maximise the use of the bypass. As a result of the bypass and Traffic Management proposals a reduction of 40% may be achieved	Traffic Management controls has been implemented encourage use of the bypass. Monitoring is currently ongoing to confirm reductions in NO2 levels	Traffic Management controls has been implemented encourage use of the bypass. Monitoring is currently ongoing to confirm reductions in NO2 levels	Completed
			Close roads in Blackheath town centre for "In Town Without my Car Day"	Close roads in Blackheath town centre for "In Town Without my Car Day"	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
			Possible Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Possible Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council has decided Red Route Treatment will no longer be implemented	Not implemented
			Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Scheme currently in development. Anticipated implementation late 2012	Ongoing

		Interim draft AQAP February 2005		Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
				Trinity way / West Bromwich Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Scheme currently in development. Anticipated implementation late 2012	Ongoing
				All Saints Way / Expressway, West Bromwich Junction improvements will provide a vehicle underpass along the line of the A41 beneath the existing roundabout. The junction will also have bus priority measures.	Junction improvements will provide a vehicle underpass along the line of the A41 beneath the existing roundabout. The junction will also have bus priority measures.	The junction improvements are currently being undertaken and are scheduled for completion in late 2011. Monitoring is continuing to confirm reductions in NO2 concentrations	The junction improvements are currently being undertaken and are scheduled for completion in late 2011. Monitoring is continuing to confirm reductions in NO2 concentrations	Ongoing
				All Saints way / Newton Road, West Bromwich Red Route (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Red Route (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Red Route has been implemented at this location. Monitoring currently ongoing to confirm a reduction in NO2 levels	Red Route has been implemented at this location - Early 2011 Monitoring currently ongoing to confirm a reduction in NO2 levels	Completed
				Sedgley Road East / Dudley Port, Tipton Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
				Sono way / Grove Lane / Cranford Street, Smethwick Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
public transport to reduce traffic	5	Showcase and Super Showcase route extension and improvements	Ongoing LTP commitment.	Public Transport to Reduce Traffic Showcase route extension and improvements (not all route funding secured). - Ongoing	Showcase route extension and improvements (not all route funding secured). - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented

Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress	
road network to reduce	6	Improvements of branding to increase attractiveness of public transport	Ongoing LTP commitment.	Improvements of branding to increase attractiveness of public transport - Ongoing	Improvements of branding to increase attractiveness of public transport - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Not yet implemented
	7	Improving access to information regarding transport options	Ongoing LTP commitment.	Improving access to information regarding transport options - Ongoing	Improving access to information regarding transport options - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Not yet implemented
	8	Promote Midland Metro extension (Wednesbury – Brierley Hill due to be open 2005/06) and investigate use of Stourbridge – Walsall freight line for passenger rail and local park & ride. (T6)	This policy is contained in the Unitary Development Plan and the Metro extension is an ongoing LTP commitment.	Promote Midland Metro extension (Wednesbury to Brierley Hill)	Promote Midland Metro extension (Wednesbury to Brierley Hill)	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
				Future Metro Phase 2 – 5W's. Wednesbury to Walsall Varsity North – A34 Birmingham to M6 Junction 7 Birmingham West – Birmingham to Quinton.	Future Metro Phase 2 – 5W's. Wednesbury to Walsall Varsity North – A34 Birmingham to M6 Junction 7 Birmingham West – Birmingham to Quinton.	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
	9	Developers will be required to include or fund measures to provide an efficient bus service (T5).	This policy is in the Unitary Development Plan but we are having discussions with the Planning Department to consider how this policy can be applied more effectively through the use of 106 agreements.	Increased bus lane enforcement (increase number of cameras on buses for bus lane enforcement) - Ongoing	Increased bus lane enforcement (increase number of cameras on buses for bus lane enforcement) - Ongoing	Sandwell Metropolitan Borough Council is currently waiting on advice from Travel West Midlands with regard to possible implementation of this action.	Sandwell Metropolitan Borough Council is currently waiting on advice from Travel West Midlands with regard to possible implementation of this action.	Not yet implemented
	10	Introduction of Red Routes to ease congestion	Ongoing LTP commitment.	Introduction of Red Routes to ease congestion - Ongoing	Introduction of Red Routes to ease congestion - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
			Road Network to Reduce					



		Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
	11	Improvement of Traffic Urban Control Systems designed to reduce congestion	Ongoing LTP commitment.		Improvement of Traffic Urban Control Systems designed to reduce congestion - Ongoing	Improvement of Traffic Urban Control Systems designed to reduce congestion - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Sandwell Metropolitan Borough Council is currently awaiting a Local Transport Plan (LTP) decision of further funding.	Not yet implemented
					Burnt Tree Island improvements	Burnt Tree Island improvements	Road improvements are currently being implemented at Burnt Tree Island. Monitoring is continuing to confirm reductions in NO2 concentrations	Road improvements close to completion at Burnt Tree Island. Monitoring is continuing to confirm reductions in NO2 concentrations	Ongoing
					Owen St crossing	Owen Street crossing	The Owen Street Crossing has been completed. The impact is currently being evaluated. There is an anticipated reduction in the background NO2.	The Owen Street Crossing has been completed. The impact is currently being evaluated. There is an anticipated reduction in the background NO2.	Completed
					Cradley Heath Bypass	Cradley Heath Bypass - Completed	The Cradley Heath Bypass has been completed. The impact is currently being evaluated. There is an anticipated reduction in the background NO2.	The Cradley Heath Bypass has been completed. The impact is currently being evaluated. There is an anticipated reduction in the background NO2.	Completed
Using area planning methods for Local Air Quality Management	12	Developers will be required to encourage other forms of transport and demonstrate how their proposals will do this.	This policy is included in the Unitary Development Plan.	Using Area Planning Methods to Reduce Traffic Volumes and Exposure					Not reported
	13	Developments that could generate high public transport use should be located within	This policy is included in the Unitary Development Plan.						Not reported

Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
	400m of public transport interchanges.						
14	Flexible approach to car parking at residential developments to enable reduced parking provision where low car ownership groups.	This policy is included in the Unitary Development Plan.					Not reported
15	Support use (reopening) of Stourbridge – Walsall line for rail freight.	This policy is included in the Unitary Development Plan.	Support use (reopening) of Stourbridge – Walsall line for rail freight - Ongoing	Support use (reopening) of Stourbridge – Walsall line for rail freight - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
			Ensure AQ considerations are included in the new Local Development Framework - Ongoing Ensure policies seek to reduce the need to travel and promote the use of modes other than the car - Ongoing	Ensure AQ considerations are included in the new Local Development Framework - Ongoing Ensure policies seek to reduce the need to travel and promote the use of modes other than the car - Ongoing	A Draft policy has been approved by Sandwell Council and is currently in place awaiting a consultation response.	A Draft policy has been approved by Sandwell Council and is currently in place awaiting a consultation response.	Ongoing
			Section 106 – Investigate the practicability of S106 agreements being used to secure monitoring funding and balancing measures in applications where AQ is an issue (section 106 agreements are to be replaced in the future with two new routes which together are designed to have the same effect as section 106 does now, the provisions retain the existing negotiated route while also providing for a set contribution payable by developers). - Ongoing	Section 106 – Investigate the practicability of S106 agreements being used to secure monitoring funding and balancing measures in applications where AQ is an issue (section 106 agreements are to be replaced in the future with two new routes which together are designed to have the same effect as section 106 does now, the provisions retain the existing negotiated route while also providing for a set contribution payable by developers). - Ongoing	A Draft policy has been approved by Sandwell Council and is currently in place awaiting a consultation response.	A Draft policy has been approved by Sandwell Council and is currently in place awaiting a consultation response.	Ongoing



		Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress
					AQ guidance - Provide guidance in relation to air quality for developers to follow when submitting planning applications - Ongoing	AQ guidance Provide guidance in relation to air quality for developers to follow when submitting planning applications - Ongoing	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented
					Congestion charging – the council will continue to monitor the implications and effectiveness of any congestion charging proposals - Ongoing	Congestion charging – the council will continue to monitor the implications and effectiveness of any congestion charging proposals	This action is pending further review and possible further funding from DEFRA	This action is pending further review and possible further funding from DEFRA	Not yet implemented
					Development Control – continue to consider air quality issues for new planning applications in line with the agreed planning protocol - Ongoing	Development Control – continue to consider air quality issues for new planning applications in line with the agreed planning protocol - Ongoing	The consideration of air quality is ongoing through the planning regime. A review of a new protocol is pending review.	The consideration of air quality is ongoing through the planning regime. A review of a new protocol is pending review.	Ongoing
Reducing vehicle emissions	16	Progressively “green” the Council fleet	All new small SMBC vehicles will be replaced with dual fuel (petrol/LPG). Currently about half of the fleet is dual fuel and the rest should be transferred within the next 4 years.	Reducing Vehicle Emissions	Improve the council fleet by – Where possible any new SMBC vehicles purchased are to Euro 4 standard - Ongoing Monthly fuel reports are produced and regular user group meetings held to try and improve efficiency - Ongoing	Improve the council fleet by – Where possible any new SMBC vehicles purchased are to Euro 4 standard - Ongoing Monthly fuel reports are produced and regular user group meetings held to try and improve efficiency - Ongoing	Liaison is continuing between the relevant Local Authority departments	Liaison is continuing between the relevant Local Authority departments	Ongoing
			Where possible any new SMBC vehicles purchased are to Euro 4 standard. Currently about 5% are to Euro 4 standard.						
	17	Improve efficiency of vehicle use	Monthly fuel reports are produced and regular user group meetings held to try and improve efficiency.						
					Promote Eco-Driving – develop promotional strategy to encourage	Promote Eco-Driving – develop promotional strategy to encourage	Liaison is continuing between the relevant Local Authority	Liaison is continuing between the relevant Local Authority	Ongoing

	Interim draft AQAP February 2005			Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress	
				drivers to drive economically	drivers to drive economically	departments	departments		
				Develop strategy to encourage drivers not to allow their engines to idle when parked	Develop strategy to encourage drivers not to allow their engines to idle when parked	The negotiations between the relevant Authority departments is currently pending	The negotiations between the relevant Authority departments is currently pending	Not yet implemented	
				Establish a programme of vehicle emission testing	Establish a programme of vehicle emission testing	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Sandwell Metropolitan Borough Council is currently awaiting a decision on further funding	Not yet implemented	
Reducing air pollution from industry, commerce and residential areas	18	Continue Black Country Energy Efficiency Advice Centre	Since 1996 some 20,000 households have received energy advice in this way.	Reducing Air Pollution from Industry, Commerce and Residential Areas	Continuation of Sandwell Energy Efficiency Advice Centre - Ongoing	Continuation of Sandwell Energy Efficiency Advice Centre - Ongoing	The Energy Efficiency Advice Centre is continuing to operate and will be ongoing for the foreseeable future.	The Energy Efficiency Advice Centre is continuing to operate and will be ongoing for the foreseeable future.	Ongoing
					Improvement of the energy rating of dwellings. The Warm Zone Scheme provides general energy efficiency advice and installation of energy efficiency measures. - Ongoing	Improvement of the energy rating of dwellings. The Warm Zone Scheme provides general energy efficiency advice and installation of energy efficiency measures. - Ongoing	The Energy Efficiency Advice Centre is continuing to operate and will be ongoing for the foreseeable future.	The Energy Efficiency Advice Centre is continuing to operate and will be ongoing for the foreseeable future.	Ongoing
Changing levels of travel demand/promotion of alternative modes of transport	19	Promotion of walking	Ongoing LTP commitment.	Changing Levels of Travel Demand / Promotion of Alternative Modes of Transport	Promotion of Walking - Ongoing	Promotion of Walking - Ongoing	Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) with regards to a strategy to improve the uptake of walking as part of a healthy lifestyle.	Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) with regards to a strategy to improve the uptake of walking as part of a healthy lifestyle.	Ongoing
	20	Promotion of Cycling	Ongoing LTP commitment. SMBC also has a cycling strategy		Promotion of Cycling - Ongoing	Promotion of Cycling - Ongoing	Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) and the Transportation department with regards to a strategy	Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) and the Transportation department with regards to a strategy to	Ongoing

Interim draft AQAP February 2005		Draft AQAP1 June 2007	AQAP1 Sept 2009	AQAP PR Oct 2010	AQAP PR July 2011	Overall progress	
21	Encourage travel Plans for employers, schools & hospitals	Ongoing LTP commitment.	Encourage travel plans for employers, schools & hospitals - Ongoing	Encourage travel plans for employers, schools & hospitals - Ongoing	to improve the uptake of cycling. Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) and the Transportation department with regards to travel plans.	improve the uptake of cycling. Sandwell Council is currently in negotiations with the Primary Care Trust (PCT) and the Transportation department with regards to travel plans.	Ongoing
			Air Quality Monitoring - Ongoing: • Reporting of results and publicity • Produce annual reports and publish results • Regularly review suitability of monitoring	Air Quality Monitoring - Ongoing: Reporting of results and publicity Produce annual reports and publish results Regularly review suitability of monitoring	Monitoring of air quality is ongoing in Sandwell and will continue subject to future funding.	Monitoring of air quality is ongoing in Sandwell and will continue subject to future funding.	Ongoing
			Air Quality info on website: • Publish AQ action plan on web and develop other service information - Ongoing	Air Quality information on website: Publish AQ action plan on web and develop other service information - Ongoing	Air quality information will continue to be provided via the website to increase public awareness but will be subject to future funding.	Air quality information will continue to be provided via the website to increase public awareness but will be subject to future funding.	Ongoing
			Promote car sharing among residents and businesses in the area - Ongoing	Promote car sharing among residents and businesses in the area - Ongoing	Sandwell Council is currently in negotiations Transportation department with regards to the promotion of car sharing.	Sandwell Council is currently in negotiations Transportation department with regards to the promotion of car sharing.	Not yet implemented
				Provide air quality information and promote sustainable transport in schools - Ongoing	The promotion of sustainable transport in schools is continuing, but will be subject to future funding.	The promotion of sustainable transport in schools is continuing, but will be subject to future funding.	Ongoing

Appendix 11. Table 6: York AQAP measures and reported annual progress 2004-2013

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
Reducing the need to travel	AP1 : Adopt supplementary planning guidance on sustainable design and construction	This document has been drafted but has been delayed due to the delay in the approval by the council of the Fourth Set of Changes to the Local Plan. This set of changes contains changes to the sustainability policy from which the SPG will hang.	The supplementary planning guidance has been drafted but has not yet been approved for consultation. Further work is being undertaken in conjunction with the transport and planning scrutiny committee with a view to the document now being adopted during 2006.	A draft SPG is currently out to a 3 month public consultation due to end on 4th May. This document has been drafted and is likely to be adopted by the council for use by end of July 2007.	City of York Council Interim Planning Statement (IPS) on Sustainable Design and Construction developed and approved by members.	Complete. Development of a low emission strategy based SPD will be the next step	Complete. The Council is currently developing an LES based Air Quality SPD which will help reduce emissions through the Planning process.	Complete. CYC is currently developing a LES due to be formally adopted in September 2012. As part of the implementation of the LES current planning documents and guidance will be reviewed and revised to incorporate the aims of the LES. This is most likely to be in the form of a new LES SPD.	Complete. City of York Council's Low Emission Strategy was formally adopted council policy on 9th October 2012. As part of the implementation of the LES, existing planning guidance is being reviewed and revised to incorporate the aims and objectives of the LES.	Complete 2012
	AP2 : Provide 16 lifetime residential units in the city	The majority of units likely to be provided within the Derwenthorpe development (approved). A pilot scheme is currently in progress at New Earswick – design competition currently in progress.	Progress regarding the provision of lifetime residential units has been adversely affected by the calling in of the Derwenthorpe planning application. The majority of the proposed lifetime residential units were planned for this site. As the future of this development is now uncertain the action point relating to the provision of lifetime homes has been							Not implemented

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
			removed from this revised AQAP. A new target may be set in the future once the planning matters have been resolved or if other suitable development sites receive planning permission.							
	AP3 : Support the development of a mixed use master plan for the York Central site for completion; AP30: Appoint a developer to draw up a mixed use Master plan for YorkCentral by 31st December 2007	Consultants currently undertaking a review of public transport access to the site. Report is due in Spring 2005	Since the publication of AQAP1 there has been a significant change in the approach being taken to the York Central project. A developer is now to be appointed prior to the drawing up of the Master plan such that the timescale for the completion of the Master plan has been significantly increased. The AQAP key action point related to the completion of the York Central Master plan has been revised to take account of this revised process.	The York Central project has recently been re-launched under the name 'York Northwest' following a decision to develop an Area Action Plan. This will cover the York Central site and the British Sugar site. Work on the Area Action Plan commenced in 2006.	The appointment of a developer for the YorkCentral site will be carried out by the major landowners, Network Rail and National Museum of Science and Industry, in partnership with Yorkshire Forward – and not the Council. The closure of the British Sugar site at Plantation Drive now means that a second major area of brownfield land, located only half a mile away from the York Central site, will be available for redevelopment. The Council are preparing an	Original Action Point (AP30) no longer valid. An Area Action Plan to cover 'York North West is currently being developed for inclusion in LDF. Funding received to support development of an eco show home on the British Sugar site.	The York Northwest (YNW) Corridor is identified within Section 6 (York Northwest) of the submission draft Core Strategy, with York Central and the former British Sugar/Manor School sites now being taken forward as Strategic Allocations. The vision and strategic objectives for the YNW area are set out together with policies for each strategic site.	York Central and the former British Sugar/Manor School sites are now being taken forward as Strategic Allocations. The area is now known as York Northwest.	A low carbon framework study to identify the most appropriate package of renewable technologies appropriate for York Northwest forms part of the background documents for the area. An SPD has been prepared for the former British Sugar/Manor School site and has been subject to public consultation	Changed, but York Northwest ongoing

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
					Area Action Plan (AAP) called the York Northwest AAP to guide and control development in this area. Timescale for developing AAP likely to be 31st December 2010. Original Action Point (AP30) no longer applicable					
	AP4 : Have a car club operational in the city	CarPlus is currently undertaking a feasibility report on the introduction of Car Clubs in York. On schedule to be implemented by December 2005	The council has invited expressions of interest for setting up car clubs from several organisations and those returned are being evaluated at present. In addition York is to be the location for a separate studied funded by DEFRA and undertaken by CarPlus aimed at quantifying the whole life carbon footprint for a car club.	A Whizz-Go car club was launched in York in September 2006 with an initial fleet of seven low-emission Citroen vehicles.	A Whizzgo car club was launched in York in September 2006 with an initial fleet of seven low-emission Citroen vehicles. Membership in York, now just over 300, split approximately 75/25%, Residential/Corporate (the later including such as City of York Council, York St.John University and Theatre Royal). Average number of hours usage per day per car is healthy and at a level where additional (2nd)	Complete. City car club currently operating 9 cars around the city with 396 members	Complete. The target is now complete City car club currently operating 7 cars around the city with 450 members.	Complete. The target is now complete City car club currently operating 7 cars around the city with 454 members.	Complete. A number of low emission vehicles now operate as part of the York car club including the Toyota Prius, Toyota Yaris hybrid and Fiat 500 TwinAir.	Complete 2006

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
					cars are being installed in existing locations (St.Leonard's Place/Union Terrace and Nunnery Lane car parks) in order to accommodate member requirements. 10 cars in total. Total monthly utilisation is again following a healthy upwards trend. 90 plus % of members rate overall satisfaction as very good/good.					
Encouraging walking and cycling	AP5 : Develop and adopt a new cycling strategy; AP32: Provide covered lockable cycle parking at all council-run schools by 31st December 2011	The new cycling strategy is currently being prepared. A draft strategy will be completed and will accompany the provisional LTP2 submission in July 2005.	New approaches to walking and cycling have been developed for LTP2 with more emphasis on safety and accessibility.	51 out of 65 LEA schools now have sheltered quality cycle parking (all lockable where deemed necessary). 6 out of 9 of the independent schools have 'adequate' cycle parking.	CYC are well on the way to achieving this target with less than 10 schools still to receive their lockable cycle parking	Primaries - 53 out of 55 have cycle parking. 14 out of the 53 which have cycle parking have shelters which aren't lockable - they were all offered lockable shelters but most of them declined this due to their sites being locked. Secondaries - 11 out of 11 have cycle parking. 4 out of 11 have cycle	Primaries - 53 out of 55 have cycle parking. 14 out of the 53 which have cycle parking have shelters which aren't lockable - they were all offered lockable shelters but most of them declined this due to their sites being locked. Secondaries - 11 out of 11 have cycle parking. 4 out of 11 have cycle	Primaries - 54 out of 55 have cycle parking. 14 out of the 54 which have cycle parking have shelters which aren't lockable - they were all offered lockable shelters but most of them declined this due to their sites being locked. Secondaries - 11 out of 11 have cycle parking. 4 out of 11 have cycle	Primaries - 55 out of 55 have cycle parking. 14 out of the 55 which have cycle parking have shelters which aren't lockable - they were all offered lockable shelters but most of those who declined did so because their sites are locked. Secondaries - 11 out of 11 have cycle parking. 4 out of	Complete 2013

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
						parking which isn't lockable for the same reasons as above. Special School - the one special school has cycle parking which is lockable	parking which isn't lockable for the same reasons as above. Special School - the one special school has cycle parking which is lockable.	parking which isn't lockable for the same reasons as above. Special School - the one special school has cycle parking which is lockable.	11 have cycle parking which isn't lockable for the same reasons as above. Special School - the one special school has cycle parking which is lockable Reassessing whether there is sufficient cycle parking at all schools as part of the LSTF project and match-funding extra provision where appropriate	
	AP6 : Develop and adopt a new pedestrian strategy	Consultants are currently reviewing the current pedestrian strategy for the city in light of government guidance. This work will feed into the draft LTP2 document due for submission in December 2005.								Complete 2006



	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	<p>AP7 : Undertake a foot streets review; AP31: Include at least one additional street in the Footstreets Pedestrian Priority Zone by 31st December 2011.</p>	<p>Consultants are currently reviewing the existing Footstreets Pedestrian Priority Zone. This work will be undertaken to feed into the draft LTP2 submission in July 2005</p>	<p>A foot streets review was undertaken in 2004 identifying where improvements / extensions can be made to the current Foot streets Pedestrian Priority Zone.</p>	<p>Briefing note prepared for Fossgate in preparation for a public consultation.</p>	<p>A brief has been issued to consultants to review the footstreets zone including its operation and whether it can be expanded. Also being addressed as part of city centre area action plan.</p>	<p>The foot streets review has been incorporated into the city centre accessibility framework (CCAF) that will form part of the evidence base for the city centre area action plan (CCAAP).</p>	<p>Members agreed to undertake further work on certain short term measures suggested as part of the Footstreets Review. These are:</p> <ul style="list-style-type: none"> <li>• Standardise the hours of operation across the week.</li> <li>• Extend the hours of operation.</li> <li>• Review and remove signs and lining which aren't needed.</li> <li>• Trial a northsouth cycle route through the zone.</li> <li>• Investigate the inclusion of Fossgate within the zone.</li> <li>• Network Management have taken on the job of moving these suggestions forwards and undertaking a city-wide consultation.</li> </ul>	<p>Transport modelling work has commenced to investigate impact of possible changes to city centre road network</p>	<p>On Monday 18th March 2013 the times of operation were extended to 10.30am to 5pm, 7 days a week - an increase of 10.5 hours per week. In addition, Davygate will be made vehicle free for the first time rather than being available to permit holders. Work is about to begin on the next phase of expanding the zone further in to Fossgate and in the longer term expanding to the rest of the Goodramgate area and Micklegate.</p>	<p>Ongoing</p>

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP8 : Have school travel plans in place at all schools in and adjacent to the AQMA; AP33: Have active school travel plans in place at all York schools by 31st December 2010.	8 have travel plans 5 do not (St Georges, Fulford, Bootham, Haxby Rd, Minster)	All but five of the schools in, or adjacent to, the AQMA now have school travel plans in place. Of the five schools remaining, four are privately owned and outside City of York Council's direct control.	At present 56 out of 65 LEA schools (86%) and 6 out of 9 (67%) independents have travel plans. Average provision 78%	Since the submission of the 06/07 Air Quality Progress Report, one additional LEA school (currently 57/65 schools) and no further independents (currently 6/9 schools) have travel plans in place.		As of April 2011 66/68 or 97% CYC state schools have approved travel plans 7/9 or 75% Independent schools have approved travel plans	As of April 2012 67/68 or 99% CYC state schools have approved travel plans. 7/9 or 78% Independent schools have approved travel plans	As of April 2013 67/68 or 99% CYC state schools have approved travel plans 7/9 or 78% Independent schools have approved travel plans	Completed as far as possible
Encouraging the use of public transport	AP9 : Open a 6th Park and Ride site; AP34: Increase capacity at Askham Bar by 250 spaces by 31st December 2007	The council has undertaken extensive consultation on options for a new Park and Ride site on the A59 corridor close to the junction with the A1237 Outer Ring Road. Selection of the preferred site will be made, pending the outcome of the York Central Study.	A fifth Park and Ride site has been opened at Monks Cross. Plans for a sixth Park and Ride site on the A59 have been postponed and replaced by new proposals to extend and improve the existing Askham Bar Park and Ride site.	Feasibility studies have been completed. Scheme more costly than originally expected due to costs of dealing with landfill material. Affordability within LTP2 lifetime currently being assessed.	Proposal was investigated in more detail in 2006/07. Concluded that it was not practical to provide additional spaces and use existing service. A relocated, enlarged site was subject to a bid for funding to the Regional Transport Board.	Planning permission for the new site has been obtained. Detailed design work and procurement of construction contract is currently taking place.	Planning permission for the new site has been obtained. Currently on hold pending further bid to DfT.	The Department for Transport granted funding for the replacement Askham Bar site on 29 November 2011.	The Department for Transport granted Programme Entry funding for the replacement Askham Bar site and new Poppleton Bar site on 29 November 2011.	Complete (funding secured 2011)

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP10 :Increase bus patronage on the 'Metro' bus routes to 28%	On schedule to meet this target by 31st December 2005. In 2003 the city had achieved 16% growth	The introduction of a 10 minute 'Metro' service on most routes through the city, combined with the upgrading of the main bus fleet, have provided a step change in the level and quality of bus services in York. Since 2000 there has been a 49% increase in general bus patronage in York, and Park and Ride numbers have for the first time exceeded 2 million passengers per year.							Complete 2006
	AP11 : Increase the percentage of households within a 13 minute walk on an hourly or better by 60%	Currently no data available								Not implemented
	AP12 : Publish and adopt a new bus information strategy	The bus information strategy was developed as part of the 2003/2004 LTP Annual Progress Report submission.	York has recently published a bus strategy (Annex F of LTP2) which forms the basis for a further step change in bus travel in the city over the next five years, with a longer-term vision to 2021.							Complete 2006

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP13 : Undertake personalised journey planning for all employees of the three largest employers in the city	No staff resource currently available to take forward this piece of work. We are aiming to restart work in autumn 05								Not implemented
	AP14 : BLISS priority measures to be introduced on 5 bus routes; AP38: Introduce real time bus information on 3 more routes by 31st March 2007 ; AP39: Introduce bus information SMS text messaging service by 31st December 2006	Real-time information provided for three routes in the city. These are 2 (Rawcliffe Bar P and R); 8 (Grimston Bar P and R) and 10 (Stamford Bridge to Poppleton). This has involved the establishment of the radio base station and the BLISS servers. It has also included fitting on bus equipment to 28 vehicles.	Bus information and reliability has been improved with the continued role out of the Bus Location Information Sub System (BLISS)	As part of the BLISS project real time bus information is now available on First York routes 2,3,4,7,8,9,10 and EYMS routes X46, X47, Arriva Selby –York and Coastliner 84X between Leeds, York and Scarborough. Real time information is available via on-street displays and kiosks, the Internet , SMS text messaging and an automated telephone service.	As part of the BLISS project, real time bus information is now available on First York routes 2,3,4,7,8,9,10 and EYMS routes X46, X47, Arriva Selby – York and Coastliner 84X between Leeds, York and Scarborough. Real time information is available via on-street displays and kiosks, the Internet, SMS text messaging and an automated telephone service.					Complete 2007

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP15 : Introduce further reductions on day travel tickets for disabled residents and residents over 60	Concessionary fares to the value of £40 are now available for older and disabled people. Currently negotiating discounted travel for trips to healthcare facilities before 9.30am.	Concessionary bus fares for older and disabled people have been introduced							Complete 2005
	AP16 : An investigation into the role of river transport to be included in the 2006-2011 local transport plan	The options are currently being examined as part of the development of the draft LTP2 due for submission in July 2005.								Not implemented
	AP17 : Introduce a discount scheme relating to travel with Yozone cards	The scheme is up and running	Incentives linked to use of leisure facilities have been developed for young people through the 'Yozone' scheme.							Complete 2005

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
			AP35: Introduce bus priority measures on A19 by 31st December 2011	Awaiting outcome of local planning enquiry on Germany Beck. The proposed Germany Beck development would introduce further travel demand on the A19 and an opportunity to obtain developer funding. These issues need to be incorporated into the new scheme design.	Consultation carried out on proposals that form the strategy for the corridor. Subject to Members approval implementation will commence in 2008/09, though bus priority likely to be 2009/10 or 2010/11 as issues still to resolve and part linked to Germany Beck junction.	One section of new bus lane between A64 and Selby Road has been completed. Two further sections of bus lane at Broadway and Hospital Fields are currently under construction and due to be completed by the end of May 2010.	The two sections of bus lane (the first on the approach to the Broadway junction and the second on the approach to the Hospital Fields Road junction) came into operation on the 24th May. Whilst these were no problems with the bus lane approaching the Broadway junction and initial monitoring indicated that the bus lane, combined with junction improvements at Heslington Lane and Broadway, had resulted in improvements to bus journey times. There were major safety concerns with the bus lane approaching the Hospital Fields Road junction, and monitoring indicated that section of bus lane was providing much less benefits	Works completed.	Works completed. A bid has recently been submitted to further improve traffic management and bus access through the area. If successful this will form part of the further AQAP measures for Fulford Road.	Complete 2011

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
							than had originally been envisaged. As a result, Members agreed that this section of bus lane should be removed (done late January 2011). Right turn lanes have been reinstated (minimising delays in the outbound direction) and provided ability to provide continuous on-road cycle lanes in both directions.			
			AP36: Undertake a trial of PBYB ticketing by 31st December 2006	Trials completed. PBYB ticketing in place on FTR services. Target is 80% of tickets on FTR services to be purchased before boarding. Currently achieving around 50%. Further pay points planned.	Trials completed. PBYB ticketing is now in place on FTR services					Complete 2007

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
			AP37: Have 10 ftr buses operational in the city by 31st March 2006	Service commenced in May 2006 on number 4 route. Twelve buses currently operational. No plans to expand the number of FTR buses at present.	Service commenced in May 2006 on number 4 route. 10 + buses currently in operation. No current plans to expand the number of FTR buses at present.					Complete 2007
			AP40: Provide 4 city centre information kiosks by 31st December 2006	Five were in place by target date. A sixth has since been added. More real time information kiosks are planned around the city combined with 'pay before you travel' points.	Six kiosks are currently in operation in the city centre					Complete 2007
			AP41: Open a new rail station at Haxby by 31st March 2009 (subject to exceptional scheme funding being received)	Exceptional scheme business case prepared to secure funding. Further line studies currently being undertaken by Network Rail.	This scheme is still under investigation. Preliminary results from line studies undertaken by network rail are encouraging. The feasibility study was put on hold during the latter half of 2007 due to staff shortages in TPU.	Project is progressing but is still subject to receipt of a regional funding allocation	The scheme is not included in the list of major projects to be funded by the government up to 2014/15 and does not appear to be suitable for the other possible funding sources such as the Regional Growth Fund or Local Sustainable	The scheme is not included in the list of major projects to be funded by the government up to 2014/15 and does not appear to be suitable for the other possible funding sources such as the Regional Growth Fund or Local Sustainable	York has recently submitted a bid for Government funding to reopen Haxby Railway Station. The Department for Transport (DfT) is currently assessing the bids for funding from a £20 million pot, with an announcement	Ongoing



	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
							Transport Fund.	Transport Fund. Progress unlikely in near future.	expected later this month. A new station at Haxby will provide better rail links for more than 22,000 people within a three-mile radius.	
Reducing the number and distance of trips within the AQMA	AP18 : An investigation into options for improving the outer ring road to be carried out; AP46: Complete ORR upgrading works at Hopgrove Roundabout and Moor Lane by 31st March 2011	A feasibility study is currently being carried out by Halcrow Group Limited.	An interim outer ring road study was completed in June 2005. Options investigated ranged from do nothing through to the provision of a dual carriageway. The most cost-effective solution to emerge was upgrading of existing roundabouts and links. A programme of works to improve the outer ring road will commence during the lifetime of LTP2 starting with the Hopgrove and Moor Lane junctions. Improvements at other junctions will follow as more funding becomes available.	Planning permission for the Moor Lane improvements has recently been obtained. Works at Hopgrove likely to be delayed due to funding problems.	In February 2008, the Highways Agency submitted a bid to Yorkshire and Humber Assembly's regional transport board to upgrade the A64 and A1237/A1036 Hopgrove and Malton Road roundabouts. The region's transport board has deferred until the summer a decision on whether to endorse the scheme for funding.	Delivered. Works completed during 2009				Complete 2009

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP19 : 800 users to be registered on the car share web site	Number of members: 555; Number of members with journeys registered: 331; Number of members with a matched journey: 92								Complete but not to target
	AP4 : Have a car club operational in the city	See AP4 above	See AP4 above	See AP4 above	See AP4 above	See AP4 above	See AP4 above	See AP4 above	See AP4 above	See AP4 above
Encouraging the use of alternative fuels and smaller more fuel efficient vehicles	AP20 : Produce and adopt a Fuel Efficient Vehicles and Alternative Fuels Strategy	Work is currently ongoing to develop proposals to encourage the use of alternative fuels and fuel efficient vehicles across the city. This work will feed into the draft LTP2 document due for submission in July 2005.	A draft alternative fuels strategy has now been drawn up (Annex N of LTP2) and covers the following:- Improving the alternative fuels infrastructure- Promoting use of alternative fuels- Establishing an alternative fuels forum							Complete 2006
	AP21 : Introduce reduce parking charges and designated parking bays for smaller, more fuel efficient vehicles; AP44: Investigate possibility of introducing	As above. A wide range of options are being considered to encourage the use of smaller, more fuel efficient vehicles as part of the work to develop LTP2.	York already offers a 50% discount on its range of parking permits for vehicles less than 2.7m in length. Discounts are also available in some council car parks where special short parking bays have been provided. During the lifetime of LTP2 it is intended to investigate other ways in which	From 1st April 2006 50% discount on: · Evening frequent users pass · Season ticket parking · Contract parking · Residents' priority parking scheme	Discounts for low emission and short vehicles were introduced on parking permits in April 2006. From 1st April 2006, a 50% discount was offered on: Evening frequent users pass, season ticket parking,					Complete 2006

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	graduated parking charges based on vehicle age, engine size or fuel type by 31st December 2011.		parking charges can be used to offer incentives for cleaner vehicle ownership.		contract parking and residents priority parking scheme.					
	AP1 : Adopt supplementary planning guidance on sustainable design and construction	See AP1 above	See AP1 above	See AP1 above	See AP1 above	See AP1 above	See AP1 above	See AP1 above	See AP1 above	See AP1 above
			AP42: Undertake an alternative fuels and smaller vehicles awareness campaign by 31st December 2008	No progress to date due to staffing issues within Transport Planning section	Development of a 'Carwise' publication, is well underway by the Transport Planning Unit. Carwise is a magazine aimed at promotion of alternative fuels, walking, cycling, and use of car clubs in the city. Publicity launch will follow mid 2008.	Carwise information leaflet produced and launched during 2008	Carwise information leaflet produced and launched during 2008	Alternative fuels strategy included in LTP3. Draft LES out for public consultation May 2012. Low emission officer appointed Feb 2012 to promote low emission vehicles and develop alternative fuel infrastructure (supported by LSTF funding)	Low emission officer appointed Feb 2012 to promote low emission vehicles and develop alternative fuel infrastructure (supported by LSTF funding). Various projects are ongoing in relation to this Action Point, including: <ul style="list-style-type: none"> <li>• CYC have worked with 5 hotels to install electric vehicle recharge points</li> </ul>	Ongoing

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
									(Zero Carbon World) • A business event was held in Feb 2013 to promote alternative fuels and cleaner vehicles • Electric car show held at York Designer Outlet (April 2013) • Energy Saving Trust Plugged In Fleet Review for CYC fleet vehicles completed • EPU has bought a Nissan Leaf electric car for use as a business demonstrator and for LES promotion • CNG refuelling feasibility study planned for summer 2013 • Electric Bus Feasibility Study ongoing • CYC is currently installing electric vehicle charging points in 10 Council car parks (each point can charge	

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
									2 vehicles)	
			AP43: Undertake a review of the taxi licensing process to identify ways in which it could be used to encourage the use of cleaner taxis and private hire vehicles	The review has been completed and a draft report drawn up for Members. Report due to go before members in May / June 2007. If findings and recommendations are accepted new taxi licensing requirements will be implemented.	New emission standards for hackney carriages introduced in June 2007. Consultation beginning with private hire trade	Euro III emission standard for taxis were introduced in June 2007.	Taxi emission policy now deferred to be a strand of Low Emission Strategy	New hackney carriage licences only to be granted to specified vehicle types after January 2012 to help promote low CO2 / alternatively fuelled vehicles. Replacement hackney carriages to be Euro 5 (diesel) and Euro 4 (petrol) after 1st June 2012. Same requirement for private hire replacements	EPU are currently in discussion with Taxi Licensing regarding licensing arrangements for low emission vehicles A taxi incentive was launched in October 2012, offering £1500 against the cost of a new or used hybrid or electric taxi. Student project investigating the emissions impact of electrifying/hybr	Ongoing

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
								after 1st November 2012.	dising different proportions the existing taxi fleet. A trial of an electric taxi is planned for Summer 2013.	
			AP45: Complete a feasibility study into a Low Emission Zone for the city by 31st March 2007	A first phase feasibility study has been completed assessing likely impact of a number of different low emission measures. A report is being prepared for Members with a view to determining which options should be taken forward for detailed traffic and air quality modelling.	As reported in City of York Council's 2006/07 Progress Report work has been done to look at the likely impact of a number of different low emission measures in the city. This work has recently been supplemented by a project carried out in conjunction with the Institute for Transport Studies (ITS) at Leeds University looking at on-street vehicle emissions. This information will be used to inform any further detailed modelling undertaken for this project.	An initial study into the likely implications of an LEZ in York was undertaken in 2006 and followed by on street emissions monitoring to assess current emissions and vehicle fleet make up in the city. No further progress has been made due to lack of funding for further research into emissions / vehicle fleet make up in the city and the current development of the LES. The status of an LEZ within the LES has not yet been decided.	Initial remote sensing study carried out in conjunction with Institute of Transport Studies at Leeds University.	LEZ bus corridor feasibility study commenced November 2011	The LEZ bus corridor feasibility study commenced in November 2011. All project elements are now complete. A report to CYC members planned for Summer 2013 to obtain a decision on future LEZ policy for the city.	Complete 2011

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
Improving traffic management and reducing congestion	AP22 : Have a fully functional Traffic Congestion Management System (TCMS) operational in the city	Work is continuing on the development of the TCMS, to a planned completion by 2008. The system is being developed as a series of stand alone objects based around a central common database (CDB).	Significant progress has also been made in the roll out of the Traffic Urban Congestion Management (UTMC) system designed to keep the network operating as effectively as possible. One of the key success of the UTMC system has been the introduction of car park information signage helping visitors to navigate their way to the nearest available parking space.	Full delivery of the project has been delayed due to shortfall in LTP2 funding – now expected to be delivered after 2011.	UTMC system now fully operational					Complete 2008
	AP23 : Develop and adopt a strategy for powered two wheelers	Work has been undertaken to identify how powered two wheelers can help achieve the government's shared priorities. This work will feed into the development of the draft LTP2 due for submission in July 2005.								Not implemented

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
Reducing emissions from heavy goods vehicles and buses	AP24 : Develop and adopt a freight strategy and action plan; AP47: Develop and adopt a lorry routing strategy by 31st March 2008	Further work has been undertaken on the study previously carried out in 2003. Specifically, this has involved examining how the outputs link with the Regional Freight Strategy	The process of drawing up a freight strategy for York has already begun. Initial investigations and consultation on the types of measures needed as undertaken in 2003 and a freight strategy has been submitted with the LTP2 submission. The main aims of the freight strategy are: <ul style="list-style-type: none"> <li>· to establish a closer working relationship with the freight industry</li> <li>· to improve lorry routing and efficiency of freight movements</li> <li>· to reduce the impact of freight movements on the environment</li> </ul>	A local freight partnership group has been established . Meetings currently on hold until a new 'fright champion' is employed within the transport planning unit.	No Progress to date. Lorry routeing was linked to Regional Freight Map which has now been abandoned. TPU will be investigating as part of local Freight Quality Partnership.	None. Lorry routeing was linked to Regional Freight Map project which has been abandoned. TPU will be investigating as part of local Freight Quality Partnership.	Work initially undertaken, funded by Yorkshire Forward, to develop a regional freight routeing strategy and freight routeing map was terminated due to increasing use of Sat-Nav	A freight study is currently being commissioned by CYC that will look at all aspects of freight movement across the city including opportunities for introduction of freight transshipment / consolidation. Air quality grant funding to implement eco-stars programme in York obtained in 2011	April 2012 update - draft freight study produced and currently under review by CYC. ECO Stars Fleet Recognition Scheme launched November 2012. Since this time, CYC has signed up 14 operators to the scheme, including the CYC fleet.	Complete 2012
	AP25 : Develop and adopt a new coach strategy and action plan; AP49: Work with bus companies to ensure that 89% of public service buses operated in	Work is ongoing to develop and introduce coach management measures in accordance with the coach study undertaken in 2003/04. Further work will be undertaken to ensure that the study outcomes are fed into to draft LTP2 due for	York has also begun working on the implementation of a coach strategy for the city which will be taken forward as part of LTP2 from April 2006.	84% of service buses used in York are currently Euro III compliant	As part of the new Park and Ride contract, 32 new Euro EEV standard buses will replace the existing Euro II and III fleet. A few bus operators are due Euro 5 in spring 2008. This should improve the	At April 2010, the % of public service buses operating in York at Euro III or above stands at 68.24%. There has been an increase of 21.02% since the last progress report in April 2008	At April 2010, the % of public service buses operating in York at Euro III or above stood at 68.24% At April 2011, the % of public service buses operating in York at Euro III or above stands at 69.4%.	April 2012 Update - 80.4% of vehicles listed for York (222 of 276 total) are Euro 3 or above.	Based on a review of local service buses undertaken for the Low Emission Zone Feasibility Study, the number of buses in York (including Park and Ride) currently Euro 3 or above is 179 or 77% of all	Ongoing



	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	York (including park and ride services) meet Euro III emission standards or better by 31st December 2011	submission in July 2005.			current figure and head towards the 89% target for 2011.				services (total 232 vehicles)	
			AP48 : Undertake a feasibility study into a transhipment centre for York by 31st December 2011	This measure is intended to be delivered later in the LTP2 programme and is not a current priority	On hold due to staffing issues within TPU.	None. Possibility of a freight transhipment centre has been put back on the agenda as part of the LES development and will be looked at during the LTP3 period	No progress has been made during the LTP2 period	As for AP47	As for AP47	Complete 2012
			AP45: Complete a feasibility study into a Low Emission Zone for the city by 31st March 2007	See AP45 above	See AP45 above	See AP45 above	See AP45 above	See AP45 above	See AP45 above	See AP45 above
			AP50: Complete a feasibility study into the introduction of a city centre electric shuttle bus by 31st December 2006	This measure is intended to be delivered later in the LTP2 programme and is not a current priority	No progress to date. Lack of Resources within TPU prevented work being undertaken on this project. Feasibility study to be considered in review of LTP2 priorities and programme.	None – project currently on hold	None	None. No longer being progressed as a specific service, but the introduction of hybrid or other alternatively fuelled vehicles being explored for the city via the LES, LEZ study and Better Bus fund.	None. No longer being progressed as a specific service, but the introduction of hybrid or other alternatively fuelled vehicles being explored for the city via the LES, LEZ study and Green Bus Fund	Not implemented

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
Reducing emissions from non-transport related sources	AP26 : Update the York emissions inventory	The York emissions inventory has been updated to include traffic from a number of developments that have now been granted planning approval. The exercise was performed as part of the over-arching air quality study that was carried out for the Foss Basin area of the city. A survey was undertaken in January 2004 to identify any new processes in the area requiring inspection under IPPC. The council is the process of undertaking these comprehensive inspections for a number of Part A1, A2 and B processes. The air quality dispersion model used by City of York Council will be updated following the completion of this work.	This work was completed in February 2004.							Complete 2004
	AP27 : Undertake a campaign to highlight the	A Publicity campaign has been undertaken raising awareness	A targeted campaign was undertaken in January / February 2004 and has been	As part of AQAP 1a targeted publicity	As part of AQAP1 a targeted publicity					Complete 2004

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	<p>requirements of smoke control orders; AP51: Undertake annual campaigns to highlight provisions of smoke control orders</p>	<p>about the existence and requirements of smoke control areas (SCAs). This has included :</p> <ul style="list-style-type: none"> <li>· Pro-active inspections in areas where increased levels of smoke emissions have been reported.</li> <li>· Warning letters were sent where appropriate.</li> <li>· An article placed in City of York Council's 'News Share' Internal publication (March 2004)</li> <li>· Information about SCAs placed on council webpage (<a href="http://www.york.gov.uk/environment/airquality/smokecontrol.html">www.york.gov.uk/environment/airquality/smokecontrol.html</a>)</li> <li>· Leaflet has been produced outlining requirements of SCAs</li> <li>· Press release in York Evening Press (9/3/04)</li> <li>· Press release in York Evening Press (11/10/04) highlighting requirements of</li> </ul>	<p>followed up by advertisements in the local press in both October 2004 and October 2005.</p>	<p>campaign was undertaken to highlight smoke control legislation. This has been followed up in recent years with further advertisements in local publications reminding people of their obligations. Information on the council website has also been updated and improved. Further advertisements planned for October 2007. Smoke control leaflet to be reprinted subject to Air Quality Grant funding being received.</p>	<p>campaign was undertaken to highlight smoke control legislation. This has been followed up in recent years with further adverts in local publications to remind people of their obligations. Information on the council website is continually updated and improved.</p>					

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
		SCAs								
	AP28 : Undertake and energy efficiency survey of domestic properties within the AQMA; AP53: Set up an energy partnership by 31st December 2007	An energy efficiency advice survey has been carried out to target residential properties within the AQMA technical breach areas. In a bid to reduce emissions with from domestic properties within the AQMA the project provided domestic occupiers with specific information to assist them in reducing their home energy use.	This work was undertaken in partnership with the York Energy Efficiency Centre.	York is a Board member of the Ryedale Energy Conservation Group. The Board is made up of local authority representatives from all North Yorkshire councils. This Group is the parent body of the Energy Advice Centre (providing advice) and Energy Partnership (based in the Energy Advice Centre, undertaking the work)	York is a Board Member of the Ryedale Energy Conservation Group. The Board is made up of local authority representatives from all North Yorkshire councils. This group is the parent body of the Energy Advice Centre (providing advice) and Energy Partnership (based in the Energy Advice Centre, undertaking the work).					Complete 2006

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
	AP29 : Introduce and annual programme of awareness raising to coincide with bonfire night; AP52: Undertake annual campaigns to raise awareness about emissions from bonfires	Press release in York Evening Press 28/10/04 re: potential health and air quality implications of having bonfires.	This has been achieved through the setting up of a system to ensure that information about the impacts of bonfires is released annually to coincide with the build up to Guy Fawkes celebrations.	Since November 2004 an annual programme of press releases and advertisements in local publications has been put in place to remind people about the environmental consequences of November 5th celebrations. Further advertisements planned for November 2007. Bonfire leaflet to be reprinted subject to Air Quality Grant funding being received.	Since November 2004 an annual programme of press releases and advertisements in local publications has been put in place to remind people about the environmental consequences of November 5th celebrations (and bonfires at other times of year).					Complete 2004
			AP54: Display energy information in all council buildings by 31st December 2011	Energy posters are currently displayed in 3 office buildings, 1 leisure centre and 15 schools	Energy Posters are currently displayed in 3 office buildings, 1 leisure centre and 15 schools. As a council we are working on being ready for the energy Performance in Buildings legislation and it	77% of council buildings identified as requiring energy certificates now have them in place. This includes 41 schools, 6 office buildings, 6 residential homes and 1 swimming pool	81% of council buildings identified as requiring DEC's have them in place. This includes 47 schools, 7 office buildings, 7 residential homes, 1 swimming pool and 1 library.	DECs in place at 54 sites: 38 schools, 6 office buildings, 6 residential homes, 1 swimming pool, 1 library, 1 Depot and 1 Children's Centre. Changes to building stock	DECs in place at 54 sites: 38 schools, 2 office buildings, 5 residential homes, 1 swimming pool, 1 library, 1 Depot and 1 Children's Centre	Ongoing

	AQAP1 2004	PR 2005	AQAP2 2006	PR 2007	PR 2008	PR 2010	PR 2011	USA 2012	PR 2013	Overall Progress
					is predicted that 90 buildings will be displaying posters by the end of October 2008.			means some of previously recorded DEC sites no longer required.		
			AP1: Adopt supplementary planning guidance on sustainable design and construction by 31st December 2006	See AP1 above.	See AP1 above.	See AP1 above.	See AP1 above.	See AP1 above.	See AP1 above.	See AP1 above.

## Appendix 12: Case study AQAP SMART scores

LA ID	LA name	Action category	AQAP draft July2003	AQAP1 Oct2004	AQAP2 consultation draft 2010	Overall progress	S	M	A	R	T	SMART score
10	Barnsley Metropolitan Borough Council	Related Plans/Policies (existing or proposed)	Measure No.1: BMBC will produce revised policy on pollution, including air pollution, which will be published in the new deposit draft LDF by summer 2004 for consultation.	Measure No.1: BMBC have produced revised policy on pollution, including air pollution, which has been published in the new deposit draft LDF during summer 2004 for consultation.		Completed Summer 2004			1		1	2
10			Measure No.2: BMBC will continue to attend and take an active part in the South Yorkshire Integrated Transport Group (Air Quality and Environment Sub-group) and its work.	Measure No.2: BMBC will continue to attend and take an active part in the South Yorkshire Integrated Transport Group (Air Quality and Environment Sub-group) and its work.		Ongoing, but no longer reported			1	1	1	3
10			Measure No.3: BMBC will ensure that this Action Plan is aligned with the LTP.	Measure No.3: BMBC will ensure that this Action Plan is aligned with the LTP.		Completed 2005/6			1	1	1	3
10		Potential Direct Measures to Improve Air Quality within the AQMA	Measure No.4 ; BMBC will explore the feasibility of the implementation of speed restrictions on the M1 with the Highways Agency by the end of April 2005.	Measure No.4: BMBC will liaise with the Highways Agency and encourage their active consideration		Ongoing, but no longer reported	1		1	1	1	4

10	General Measures to Reduce Pollution from Transport Sources	Measure No.5: BMBC will explore the feasibility of the use of variable messaging/traffic management schemes with the Highways Agency by the end of April 2005.	of measures to reduce emissions from the M1 motorway by the end of April 2005.			1		1	1	1	4
10		Measure No.6: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07	Measure No.5: BMBC will proceed with the Dodworth by-pass and associated junction 37 development scheme for completion by 2006/07		Completed September 2006	1		1	1	1	4
10		Measure No.7: BMBC will continue to work with developers and employers to improve sustainable transport links to new economic and residential developments.	Measure No.6: BMBC will continue to work with developers and employers to improve sustainable transport links to new economic and residential developments.	Over 95% of the Borough's schools now have school travel plans, whilst the number of voluntary and conditioned business related travel plans continues to grow. It is important that this work continues.	Ongoing		1	1	1	1	4
10		Measure No.8: BMBC will take part in the South Yorkshire Vehicle Emissions Testing Partnership in order to raise awareness of pollution from vehicles.	Measure No.7: BMBC has taken part in the South Yorkshire Vehicle Emissions Testing Partnership in order to raise awareness of pollution from vehicles.		Completed			1	1	1	3
10		Measure No.9: As part of the SYVET project, BMBC will carry out 3 days formal emissions testing and 3 days informal emissions testing within the	Measure No.8: As part of the SYVET project, BMBC have undertaken 3 days formal emissions		Completed			1	1	1	3



		borough by the end of December 2003.	testing and 3 days informal emissions testing within the borough. This work was completed during 2003.								
10		Measure No.10: BMBC will continue to provide the Smoky Diesel Hotline Service on telephone number 01226 772458	Measure No.9: BMBC will continue to provide the Smoky Diesel Hotline Service on telephone number 01226 772458	Since 2000, there have been 20 referrals to the smoky diesel hotline. This may not seem a significant number, but as this service is not resource intensive, this service will remain available.	Ongoing		1	1	1	1	4
10			Measure no. 25 – BMBC will explore methods of encouraging the uptake of alternative fuels within the Borough by the end of April 2006.					1		1	2
10			Measure no. 26 – BMBC will explore methods of encouraging the conversion of older vehicle types to clean alternatives by the end of April 2006.	Encourage uptake of lower emission vehicles and alternative fuels by participating in the LTP funded South Yorkshire “Low carbon re-fuelling infrastructure” project	Ongoing						0
10	Targeting of Monitoring within the AQMA and across the Borough	Measure No.11: BMBC will carry out further NO2 diffusion tube monitoring, including co-location, within the AQMA and surrounding area by the end of April 2004.	Measure No.10: BMBC have undertaken further NO2 diffusion tube monitoring, including co-location, within the AQMA and surrounding area, up to and beyond the end of April 2004. The data from this monitoring	Countywide Monitoring	Ongoing			1		1	2

			are reported in this Plan.												
10			Measure No.12: BMBC will continue to locate a real time NO2 monitor within the AQMA until the end of April 2004.	Measure No.11: BMBC have located a real time NO2 monitor adjacent to the AQMA, and data from this monitoring are reported in this Plan.						1	1	1	3		
10			Measure No.13: BMBC will continue to expand and update its air pollution modelling capability	Measure No.12: BMBC will continue to expand and update its air pollution modelling capability	Countywide Modelling and EDB	Ongoing				1	1	1	1	4	
10			Measure No.14: BMBC will produce a written monitoring strategy for the borough by the end of December 2005.	Measure No.13: BMBC will produce a written monitoring strategy for the borough by the end of December 2005.		Not completed					1	1	1	3	
10	General Measures to Reduce Emissions from Industrial and Domestic Sources		Measure No.15: BMBC will continue to provide comprehensive control over emissions from Part B and A2 processes, and act as consultees to the Environment Agency for part A1 processes.	Measure No.14: BMBC will continue to provide comprehensive control over emissions from Part B and A2 processes, and act as consultees to the Environment Agency for part A1 processes.	Continuing regulation of PPC related process has minimised emissions to air from these processes. This has and will continue to have a positive impact on the quality of the air generally in the Borough.	Ongoing					1	1	1	1	4

10		Measure No.16: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to industrial smoke.	Measure No.15: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to industrial smoke.	Continuing regulation of non PPC related process has minimised emissions to air from these processes. This has and will continue to have a positive impact on the quality of the air generally in the Borough.	Ongoing		1	1	1	1	4
10		Measure No.17: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to domestic smoke control, and will implement a publicity campaign to raise awareness of the issue throughout the borough by the end of December 2005.	Measure No.16: BMBC will continue to enforce the provisions of the Clean Air Act 1993 with regards to domestic smoke control, and will implement a publicity campaign to raise awareness of the issue throughout the borough by the end of December 2005.	Continuing regulation of domestic emissions to air has and will continue to have a positive impact on the quality of the air generally in the Borough	Ongoing		1	1	1	1	4
10		Measure No.18: BMBC will continue to investigate complaints about nuisance, and take appropriate action to resolve the problem.	Measure No.17: BMBC will continue to investigate complaints about nuisance, and take appropriate action to resolve the problem.	Resolving of nuisance issues will continue to have a positive impact on the quality of the air generally in the Borough.	Ongoing		1	1	1	1	4
10		Measure No.19: BMBC will continue to encourage composting of waste rather than burning, by publicity and the provision of discounted cost composting units.	Measure No.18: BMBC will continue to encourage composting of waste rather than burning, by publicity and the provision of discounted cost composting units.		Ongoing, but no longer reported			1		1	2



10	General Measures to Promote Air Quality Issues	Measure No.23: BMBC will produce Supplementary Planning Guidance as to acceptable development within the AQMA, and requirements on developers by the end of December 2004.	Measure No.22: BMBC will produce Supplementary Planning Guidance as to acceptable development within the AQMA, and requirements on developers by the end of December 2004.		Not completed			1		1		2
10		Measure No.24: BMBC will ensure that all major traffic schemes are assessed for air quality impacts against the NAQS objectives.	Measure No.23: BMBC will ensure that all major traffic schemes are assessed for air quality impacts against the NAQS objectives.	Since 2004, all major traffic schemes have been assessed for their air quality impacts. It is important that this work continues.	Ongoing		1	1	1	1		4
10		Measure No.25: BMBC will produce a web site for the provision of air quality information, by the end of December 2004.	Measure No.24: BMBC will produce a web site for the provision of air quality information, by the end of December 2004.		Completed Summer 2005				1		1	
10	Additional measures introduced in 2010 AQAP			Construction of Burton Road Quality Bus Corridor (AQMA No. 3)	Ongoing	1	1	1	1	1		5
10				Barnsley Statutory Quality Partnership Scheme (Bus Partnership)	Completed Summer 2010		1	1	1	1		4
10				Barnsley Intelligent Transport System	Completed	1	1	1	1	1		5
10				Care4Air	Completed		1	1	1	1		4
10				Alteration of location of traffic lights (AQMA No. 5)	Ongoing	1	1	1	1	1		5
10				Implementation of cycling and walking routes adjacent or in AQMAs	Ongoing		1	1	1	1		4
10				Low Emission Strategy Package	Ongoing		1	1	1	1		4
10				Park and Ride Schemes	Ongoing		1	1	1	1		4

10					Barnsley MBC Travel Plans (general)	Ongoing		1	1	1	1		4
10					ECO Stars HDV Recognition Scheme	Ongoing		1	1	1	1		4
10					Targeted Vehicle Emission Testing	Completed		1	1	1	1		4
36			<b>AQAP1 April 2004</b>	<b>LTP APR 2004/2005</b>	<b>JLTP2 2006/7-2010/11</b>	<b>Overall progress</b>							
36	Bristol City Council	Information and Promotion	1 Information & Awareness Initiatives			Ongoing			1	1	1		3
36			Signing / route guidance			No longer reported.			1	1	1		3
36			Public Transport Information			No longer reported.			1	1	1		3
36			Parking information			No longer reported.			1	1			2
36			Public transport initiatives – Bus			No longer reported.	1		1	1	1		4
36		Public transport initiatives - Park & Ride			No longer reported.	1		1	1	1		4	
36		Public transport initiatives – Rail			No longer reported.	1		1	1	1		4	
36		Public transport initiatives – other (LRT)			No longer reported.	1		1	1	1		4	
36		2 Travel Plans			Ongoing work to increase schools with approved travel plans within BCC authority area and across West of England area.		1	1	1	1		4	
36		3 Safer Routes to School			Ongoing		1	1	1	1		4	
36		4 Shorter Journeys (including Individualised Travel Marketing)			Ongoing. No specific NOx analysis, but PTP projects have shown a 10% decrease in car use amongst participating households.		1	1	1	1		4	
36		5a Walking			JLTP3 Walking Supporting Statement, part of finalised JLTP3 document 2011-2026 published March 2010/11. Bristol Walking Strategy adopted various actions ongoing			1	1	1		3	
36		5b Cycling Facilities			Ongoing. BCC propose to build on the LSTF business engagement programme and extend the successful loan bikes to business programme to electric pool bikes.		1	1	1	1		4	

36	Managing the Road Network	6 Car Clubs		Ongoing		1	1	1	1	4	
36		Powered twowheelers (PTW)		No longer reported.			1			1	
36		Revision of the road hierarchy		No longer reported.				1	1	1	3
36		7 Reallocation of Road (Bus Priority measures )		Ongoing		1	1	1	1	1	5
36		8 Improved enforcement of existing speed limits		Ongoing		1	1	1	1	1	5
36		9 Area-based speed reduction (20 mph zones in residential areas )		2 Pilot zones completed by 2011. Citywide phased rollout estimated for completion by January 2015. No specific target emissions reduction, but air quality monitoring was conducted on the two pilot zones. Further monitoring will be carried across the city. The effect on air quality in the pilot zones concluded to be too small to be measurable, although positive impact should be seen over time associated with modal shift.		1	1	1	1	1	5
36		Home Zones		No longer reported.				1	1	1	3
36		Pedestrianisation		No longer reported.				1	1	1	3
36		10 Intelligent traffic signals (Traffic Urban Management & Control -UTMC)		Ongoing		1	1	1	1	1	5
36		11 Traffic management at pollution hot spots		Ongoing. No overall assessment of NOx, but monitoring shows congestion levels across the AQMA reduced by some 5% since 2006.		1	1	1	1	1	5
36		Parking policy		No longer reported.				1	1	1	3
36		12 Parking Enforcement & Management of Delivery Times		Ongoing		1	1	1	1	1	5
36		New Roads/ Road improvements		No longer reported.		1		1			2
36		13a Stronger enforcement of current motorway speed limits		Ongoing		1	1	1	1	1	5
36		13b Reduced Motorway speed limits in AQMAS			1	1	1	1	1	5	

36		14 M32 Management			Completed September 2008	1	1	1	1	1	5
36		15 Freight trans-shipment centres			Ongoing. Overall the scheme in Bristol has reduced freight movements by 380,000km leading to a reduction in NOX emissions of 3,300kg and 100kg of PM10's so far.	1		1	1	1	4
36	Emissions Management	16 Reduce emissions from poorly driven vehicles			Ongoing under other measures.	1		1		1	3
36		17 Vehicle maintenance-Roadside Emissions Testing			Trial not continued.	1	1	1	1	1	5
36		18 Encouragement of more efficient vehicles.			Not continued.		1	1		1	3
36		19 Promote / pilot alternative vehicles / fuels.			Ongoing		1	1		1	3
36		20 Advice / incentives for 'cleaning up' large vehicles			Discontinued due to funding termination and technical issues.	1	1	1	1	1	5
36		21 Retrofitting Smaller Vehicles			Not cost-effective.	1	1	1		1	4
36		22 Scrappage Incentives			Local scheme unnecessary.	1	1	1	1	1	5
36		23 Bus Emissions Regulation (emissions standards in contracts)			Ongoing. It is predicted that the conversion of 16 buses from Euro IV to Euro V should save almost 2 tonnes of NOx per year.	1	1	1	1	1	5
36		24 Promote and assist freight emissions agreements			Not continued.	1	1	1	1	1	5
36		25 Low Emission Zone ( LEZ) Study Possible Scheme			BCC will commission an update of the 2006 Low Emissions Strategy Study, to review the cost – effectiveness of various Low Emissions strategies, including Low Emissions Zones and recommend short and medium-term delivery options for the Mayor's Air Quality Strategy.	1		1	1	1	4
36		26 Road User Charging (RUC)			No longer reported.	1		1	1	1	4
36		27 Clear Zone			Clear Zone no longer being progressed.	1		1	1	1	4



36		Bus NOx emissions Reduction			Completed, further project ongoing. An application is going to be made for further funds to retrofit the bus fleet in Bristol in order to improve emissions from busses operating within the AQMA.	1						1	
36	Other Transport Measures	Land use planning						1	1	1		3	
36		Rail Freight						1	1	1		3	
36		Maritime – Ports						1	1	1		3	
36		Maritime Inland Waterways						1	1	1		3	
36		Airport - Surface Strategy						1		1		2	
36		Industrial	Local abatement					1	1	1		3	
36			Emission reduction					1	1	1		3	
36		Domestic	Energy conservation					1	1	1		3	
36			Smoke control					1	1	1		3	
36			Nuisance policy (bonfires)					1	1	1		3	
36		EUROPEAN TRANSPORT INITIATIVES		VIVALDI: Implementation of VIVALDI project measures including progression of elements under the 8 key project themes. Works for 2003/04 include the development of the Dings Home Zone, clean vehicle initiatives, launch of parking/Park & Ride smartcard, Travelsmart campaign phase 2 in Hartcliffe, completion of the internet trip planner, development of transport telematics		No longer reported							0





63	York City Council	Reducing the need to travel	AP1 : Adopt supplementary planning guidance on sustainable design and construction	The supplementary planning guidance has been drafted but has not yet been approved for consultation. Further work is being undertaken in conjunction with the transport and planning scrutiny committee with a view to the document now being adopted during 2006.		Complete 2012		1	1	1	1	4
63			AP2 : Provide 16 lifetime residential units in the city	Progress regarding the provision of lifetime residential units has been adversely affected by the calling in of the Derwenthorpe planning application. The majority of the proposed lifetime residential units were planned for this site. As the future of this development is now uncertain the action point relating to the provision of lifetime homes has been removed from this revised AQAP. A new target may be set in the future once the planning matters have been resolved or if other suitable development sites		Not implemented				1	1	

			receive planning permission.									
63			AP3 : Support the development of a mixed use master plan for the York Central site for completion; AP30: Appoint a developer to draw up a mixed use Master plan for YorkCentral by 31st December 2007	Since the publication of AQAP1 there has been a significant change in the approach being taken to the York Central project. A developer is now to be appointed prior to the drawing up of the Master plan such that the timescale for the completion of the Master plan has been significantly increased. The AQAP key action point related to the completion of the York Central Master plan has been revised to take account of this revised process.		Changed, but York Northwest ongoing		1	1	1	1	4
63			AP4 : Have a car club operational in the city	The council has invited expressions of interest for setting up car clubs from several organisations and those returned are being evaluated at present. In addition York is to be the location for a separate studied funded by DEFRA and undertaken by CarPlus aimed at quantifying the whole life carbon		Complete 2006		1	1	1	1	4

			footprint for a car club.									
63	Encouraging walking and cycling	AP5 : Develop and adopt a new cycling strategy; AP32: Provide covered lockable cycle parking at all council-run schools by 31st December 2011	New approaches to walking and cycling have been developed for LTP2 with more emphasis on safety and accessibility.		Complete 2013		1	1	1	1		4
63		AP6 : Develop and adopt a new pedestrian strategy			Complete 2006			1	1	1		3
63		AP7 : Undertake a foot streets review; AP31: Include at least one additional street in the Footstreets Pedestrian Priority Zone by 31st December 2011.	A foot streets review was undertaken in 2004 identifying where improvements / extensions can be made to the current Foot streets Pedestrian Priority Zone.		Ongoing		1	1	1	1		4
63		AP8 : Have school travel plans in place at all schools in and adjacent to the AQMA; AP33: Have active school travel plans in place at all York schools by 31st December 2010.	All but five of the schools in, or adjacent to, the AQMA now have school travel plans in place. Of the five schools remaining, four are privately owned and outside City of York Council's direct control.		Completed as far as possible		1	1	1	1		4

63	Encouraging the use of public transport	AP9 : Open a 6th Park and Ride site; AP34: Increase capacity at Askham Bar by 250 spaces by 31st December 2007	A fifth Park and Ride site has been opened at Monks Cross. Plans for a sixth Park and Ride site on the A59 have been postponed and replaced by new proposals to extend and improve the existing Askham Bar Park and Ride site.		Complete (funding secured 2011)	1	1	1	1	1	5
63		AP10 :Increase bus patronage on the 'Metro' bus routes to 28%	The introduction of a 10 minute 'Metro' service on most routes through the city, combined with the upgrading of the main bus fleet, have provided a step change in the level and quality of bus services in York. Since 2000 there has been a 49% increase in general bus patronage in York, and Park and Ride numbers have for the first time exceeded 2 million passengers per year.		Complete 2006			1	1	1	3
63		AP11 : Increase the percentage of households within a 13 minute walk on an hourly or better by 60%				Not implemented			1	1	1

63		AP12 : Publish and adopt a new bus information strategy	York has recently published a bus strategy (Annex F of LTP2) which forms the basis for a further step change in bus travel in the city over the next five years, with a longer-term vision to 2021.		Complete 2006			1	1	1	3
63		AP13 : Undertake personalised journey planning for all employees of the three largest employers in the city			Not implemented			1	1	1	3
63		AP14 : BLISS priority measures to be introduced on 5 bus routes; AP38: Introduce real time bus information on 3 more routes by 31st March 2007 ; AP39: Introduce bus information SMS text messaging service by 31st December 2006	Bus information and reliability has been improved with the continued role out of the Bus Location Information Sub System (BLISS)		Complete 2007	1	1	1	1	4	
63		AP15 : Introduce further reductions on day travel tickets for disabled residents and residents over 60	Concessionary bus fares for older and disabled people have been introduced		Complete 2005			1	1	1	3
63		AP16 : An investigation into the role of river transport to be included in the 2006-2011 local transport plan			Not implemented			1	1	1	3
63		AP17 : Introduce a discount scheme relating to travel with Yozone cards	Incentives linked to use of leisure facilities have been developed for young people through the 'Yozone' scheme.		Complete 2005			1	1	1	3



63			AP35: Introduce bus priority measures on A19 by 31st December 2011		Complete 2011	1	1	1	1	1	5
63			AP36: Undertake a trial of PBYB ticketing by 31st December 2006		Complete 2007		1	1	1	1	4
63			AP37: Have 10 ftr buses operational in the city by 31st March 2006		Complete 2007	1	1	1	1	1	5
63			AP40: Provide 4 city centre information kiosks by 31st December 2006		Complete 2007		1	1	1	1	4
63			AP41: Open a new rail station at Haxby by 31st March 2009 (subject to exceptional scheme funding being received)		Ongoing			1	1	1	3
63	Reducing the number and distance of trips within the AQMA	AP18 : An investigation into options for improving the outer ring road to be carried out; AP46: Complete ORR upgrading works at Hopgrove Roundabout and Moor Lane by 31st March 2011	An interim outer ring road study was completed in June 2005. Options investigated ranged from do nothing through to the provision of a dual carriageway. The most cost-effective solution to emerge was upgrading of existing roundabouts and links. A programme of works to improve the outer ring road will commence during the lifetime		Complete 2009	1	1	1	1	1	5

			of LTP2 starting with the Hopgrove and Moor Lane junctions. Improvements at other junctions will follow as more funding becomes available.									
63			AP19 : 800 users to be registered on the car share web site			Complete but not to target			1	1	1	3
63			AP4 : Have a car club operational in the city	See AP4 above		See AP4 above						
63	Encouraging the use of alternative fuels and smaller more fuel efficient vehicles		AP20 : Produce and adopt a Fuel Efficient Vehicles and Alternative Fuels Strategy	A draft alternative fuels strategy has now been drawn up (Annex N of LTP2) and covers the following: <ul style="list-style-type: none"> <li>· Improving the alternative fuels infrastructure</li> <li>· Promoting use of alternative fuels</li> <li>· Establishing an alternative fuels forum</li> </ul>		Complete 2006			1	1	1	3
63			AP21 : Introduce reduce parking charges and designated parking bays for smaller, more fuel efficient vehicles; AP44: Investigate possibility of introducing graduated parking charges based on vehicle age, engine size or fuel type by 31st December 2011.	York already offers a 50% discount on its range of parking permits for vehicles less than 2.7m in length. Discounts are also available in some council car parks where special short parking bays have been provided. During the lifetime of LTP2 it is intended to investigate other ways in which		Complete 2006		1	1	1	1	4

			parking charges can be used to offer incentives for cleaner vehicle ownership.									
63			AP1 : Adopt supplementary planning guidance on sustainable design and construction	See AP1 above		See AP1 above						
63				AP42: Undertake an alternative fuels and smaller vehicles awareness campaign by 31st December 2008		Ongoing			1	1	1	3
63				AP43: Undertake a review of the taxi licensing process to identify ways in which it could be used to encourage the use of cleaner taxis and private hire vehicles		Ongoing			1	1		2
63				AP45: Complete a feasibility study into a Low Emission Zone for the city by 31st March 2007		Complete 2011		1	1	1		4
63	Improving traffic management and reducing congestion		AP22 : Have a fully functional Traffic Congestion Management System (TCMS) operational in the city	Significant progress has also been made in the roll out of the Traffic Urban Congestion Management (UTMC) system designed to keep the network operating as effectively as possible. One of the key success of the UTMC system has		Complete 2008		1	1	1	1	5

			been the introduction of car park information signage helping visitors to navigate their way to the nearest available parking space.												
63			AP23 : Develop and adopt a strategy for powered two wheelers			Not implemented				1	1	1	3		
63		Reducing emissions from heavy goods vehicles and buses	AP24 : Develop and adopt a freight strategy and action plan; AP47: Develop and adopt a lorry routing strategy by 31st March 2008	The process of drawing up a freight strategy for York has already begun. Initial investigations and consultation on the types of measures needed as undertaken in 2003 and a freight strategy has been submitted with the LTP2 submission. The main aims of the freight strategy are: · to establish a closer working relationship with the freight industry · to improve lorry routing and efficiency of freight movements · to reduce the impact of freight movements on the environment		Complete 2012				1	1	1	1	1	5

63	Reducing emissions from non-transport related sources	AP25 : Develop and adopt a new coach strategy and action plan; AP49: Work with bus companies to ensure that 89% of public service buses operated in York (including park and ride services) meet Euro III emission standards or better by 31st December 2011	York has also begun working on the implementation of a coach strategy for the city which will be taken forward as part of LTP2 from April 2006.	Ongoing	1	1	1	1	1	5	
63			AP48 : Undertake a feasibility study into a transhipment centre for York by 31st December 2011	Complete 2012			1	1	1	3	
63			AP45: Complete a feasibility study into a Low Emission Zone for the city by 31st March 2007		See AP45 above						
63			AP50: Complete a feasibility study into the introduction of a city centre electric shuttle bus by 31st December 2006		Not implemented			1	1	1	3
63			AP26 : Update the York emissions inventory	This work was completed in February 2004.	Complete 2004			1	1	1	3
63			AP27 : Undertake a campaign to highlight the requirements of smoke control orders; AP51: Undertake annual campaigns to highlight provisions of smoke control orders	A targeted campaign was undertaken in January / February 2004 and has been followed up by advertisements in the local press in both October 2004 and October 2005.	Complete 2004			1	1	1	3

63		AP28 : Undertake and energy efficiency survey of domestic properties within the AQMA; AP53: Set up an energy partnership by 31st December 2007	This work was undertaken in partnership with the York Energy Efficiency Centre.		Complete 2006				1	1	1	3
63		AP29 : Introduce and annual programme of awareness raising to coincide with bonfire night; AP52: Undertake annual campaigns to raise awareness about emissions from bonfires	This has been achieved through the setting up of a system to ensure that information about the impacts of bonfires is released annually to coincide with the build up to Guy Fawkes celebrations.		Complete 2004				1	1	1	3
63			AP54: Display energy information in all council buildings by 31st December 2011		Ongoing				1	1	1	3
63			AP1: Adopt supplementary planning guidance on sustainable design and construction by 31st December 2006		See AP1 above.							
144		<b>AQAP1 Sept 2004</b>	<b>LTP2 March 2006</b>	<b>LTP3 March 2011</b>	<b>Overall progress</b>							

144	Leicester City Council	Emissions Management	Roadside emissions testing	Roadside emissions testing (statutory and voluntary) - Pollution Group, programme scheduled for 2006/7 and subsequent years. Not self-funding and has to be met from existing resources / policing issues:- Statutory / voluntary emissions testing. Survey of efficacy of voluntary arrangement with Bus Operators to shut off engines when stationary – enforcement programme, if justified.	Roadside emissions testing	Ongoing			1	1	1	3
144			Campaigns to eliminate old / poorly maintained / illegal vehicles	Campaigns to eliminate old / poorly maintained vehicles - Dependent on outcome of Government study	Eliminating polluting vehicles	Ongoing				1	1	2
144			Campaigns to influence driving style/short journeys	See Information and Education	See Information and Education	See Information and Education			1	1	1	3

144			Low Emission Zone	<p>Low Emission Zones - The implementation of LEZ's within the time-frame of the LTP 2006-11 has been considered and rejected for the following reasons:  Economic harm to City Centre.  Difficulties / costs for local business in adapting procedures, infrastructure and vehicle fleets.  Issues with definition: Physical extent, excluded vehicles etc. Issues with enforcement: Administrative and technological aspects.</p>		Possible Environment Zone (EZ)	1		1	1	1	4
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144			Managing vehicle size in City centre / Freight hub/node	Control of vehicle size in City centre – Freight Hubs - Ongoing, LTP Air Quality. Voluntary co-operation by operators.	Our freight strategy has been guided by our successful Leicester and Leicestershire Freight Quality Partnership (FQP) that has been making steady progress since its inception. This has raised awareness of freight issues between members, enabled the councils to understand the practical problems of the operators and enabled a freight signing strategy to be developed and implemented. We have been able to influence the Regional Freight Strategy such that a Regional Freight Group was established in 2006, of which we were members, to deliver support for Freight Quality Partnerships, disseminate best practice and coordinate actions. With the demise of the region and the introduction of the localism agenda, local partnerships such as our FQP will take on key roles.	Ongoing			1	1	1	3
144			Making through/heavy traffic avoid Inner Ring Road	Diverting through / heavy traffic from the Inner Ring Road - Ongoing, LTP Congestion Strategy. Improved signing.	Diverting through traffic from inner ring road	Ongoing	1		1	1	1	4
144			Minimum emission standards for buses (Bus Quality Partnership)	Minimum emission standards for buses - Ongoing (Euro IV introduced at end 2005). Quality Bus Partnership.	Minimum emission standards for buses	Ongoing	1		1	1	1	4

144		Fleet Purchase favouring low emission vehicles for City Council Fleet	City Council vehicle fleet policy (new procurement and retrofit) - Council EMAS programme (Under periodic review by Environment Unit). Progress will occur naturally with introduction of Euro IV vehicles. Progress with radical options / retrofit of existing vehicles unlikely within LTP 2006 timescale but serious cost implications.	Council fleet policy	Ongoing	1		1	1	1	4
144		Partnerships with (and advice for) other fleet operators	Partnerships / advice for other fleet operators - LTP Air Quality. Freight Quality Partnership	Partnerships with other fleet operators	Ongoing			1	1	1	3
144		Promotion of alternative fuels	Promotion of alternative fuels - Council EMAS programme (Under periodic review by Environment Unit). City Council can influence by example. 5% biodiesel blend in use in Council vehicles. Pilots with battery vehicles, hybrids and alternative internal combustion fuels undertaken or in progress.	Promotion of alternative fuels	Ongoing				1	1	2

144	Information and Education	See Emissions Management	Campaigns to influence driver behaviour - Pollution Control: Periodic media campaigns associated with other initiatives. Target driving style, speed, short / unnecessary journeys. Emphasise economic benefits to driver.	Campaigns to influence driver behaviour	Ongoing						1	1		2
144		Real time air quality information	Real time air quality information (VMS) - LTP, Congestion Strategy	Real-time air quality / route information (VMS)	Ongoing				1	1	1			3
144		Improved links between air quality and health issues	Education on air quality and health / sustainability - Pollution Control: Periodic media campaigns associated with other initiatives. City Council / LEP Environment Strategy Climate Change Strategy. Implications for air quality and health: • AQMA • Road users. Sustainability and Climate Change Issues.	Education on air quality and health / sustainability	Ongoing				1	1	1			3
144		Website as a medium	Website - Air quality data website commissioning in 2005 (Pollution Control). Periodic update of explanatory / educational text	Websites	Ongoing							1	1	

			focussed on issues.										
144			Target house movers/buyers					1	1	1		3	
144			Promote and reward car free days	Promoting car free days - Periodic campaigns	Promoting carfree days	Ongoing		1	1	1		3	
144			Mobility management strategy					1				1	
144			Targeting short journeys					1	1	1		3	
144			School curriculum (young people) Breathe Easy	School curriculum and campaigns - 'Breathe Easy' programme in 2005 and beyond.	School campaigns	Ongoing		1	1	1		3	
144			Education of Officers/Members					1	1	1		3	
144		Land Use Planning	Increase officer/member awareness						1	1		2	
144			Input into strategic /area planning guidance (SPGs)	Input to Replacement Local Plan. Some policies rejected by Inspector at end of 2004. Modified CLLP at end of 2005.				1	1	1		3	
144			Pre-application involvement, LRC etc.	Input to LRC / SPG briefs.				1	1	1		3	
144			Development Control procedures: Protocol for AQ assessment where develop adversely affects air quality of development is sensitive to air quality	Improved Development Control procedures for dealing with development in AQMA.				1	1	1		3	
144			Tree planting							1	1		2
144				Impact of development on transport system / Parking provision. All significant developments assessed for transport impact.									0
				• Conditions• Legal agreements. Policies for									



				services and the wider city economy. Surplus income from the city council's car parking operations is reinvested in transport services such as subsidised bus services.							
144		Reallocation of road space	Reallocation of road space - LTP, Congestion Strategy. Associated with general improvement in facilities: "Quality Bus Corridors"	Reallocation of road space. Quality bus corridors	Ongoing	1		1	1	1	4
144		Enforcement of speed limits and access restrictions	Enforcing speed limits / access restrictions - LTP, Safety Strategy. Review of speed limits DfT guidance awaited	Enforcing speed limits / access restrictions	Ongoing	1		1	1	1	4
144		Traffic calming / Blocking rat runs	Traffic calming and diverting rat runs - LTP, Safety Strategy. 18 residential distributor roads and 15 areas on current priority list	Traffic calming / diverting rat runs	Ongoing	1		1	1	1	4
144		City centre / other 20 mph zones	City centre and other 20 mph zones - LTP, Congestion Strategy. Review of speed limits DfT guidance awaited	City centre and other 20 mph zones	Ongoing	1			1	1	3
144		Pedestrian and cycle priority							1	1	2
144		Signing and route guidance. Variable message signs	Signing and route guidance (VMS) - LTP, Congestion Strategy. Already provided for car parks. Network information to be added	Signing and route guidance (VMS)	Ongoing			1	1	1	3

144		Parking information (VMS)						1	1	1	3	
144		County and Regional co-ordination						1	1	1	3	
144			Management of congestion from road works and events - LTP-2, Congestion Strategy. Traffic Management Act 2004	The city council's Traffic Management Section manages the Traffic Urban control centre and "keeps traffic moving", through the council's Network Management Plan, in accordance with the Network Management Duty.	Ongoing	1			1	1	3	
144			Junction improvements - LTP, Congestion Strategy.	Junction improvements	Ongoing	1			1	1	3	
144			Signalling improvements - LTP, Congestion Strategy. Optimise existing SCOOT system. Includes SVD for buses	Signalling improvements	Ongoing	1			1	1	3	
144	Promotion and Provision of Alternatives	Leicester West Transport Scheme	Park and ride schemes - LTP, Congestion Strategy: Towards end of period. Development of one further site in lifetime of LTP 2006-11?	We have two permanent park and ride sites. The site at Enderby, south-west Leicester, is a 1,000 space car park and 10 minute frequency into and around Leicester city centre. The site at Meynells Gorse, west Leicester, has a 500 space car park and 10 minute frequency into and around Leicester city centre. A third site, with 1,000 spaces and a 10 minute frequency running from Birstall, north of Leicester, is currently under construction. We are looking at linking the Enderby and Birstall services to improve efficiency of the service, and also to provide a link between the railway station and bus station. There is also a Saturday-only site at County Hall.	Ongoing	1			1	1	1	4

144			Improved buses	Improved buses	Our Central Leicestershire Quality Bus Partnership was established in 1999. The members of the main steering group are Leicester City and Leicestershire County Councils, First Bus, Arriva and Trent Barton. The main steering group meets quarterly and discusses issues which are not commercially sensitive. It is supported by the Bus Operations Group and the Bus Information Strategy Group. In addition to these multi-party meetings, the councils meet the two main operators (First and Arriva) quarterly in bi-lateral meetings at which commercially sensitive issues can be discussed.	Ongoing			1	1	1	3
144			Public transport information (real time)	Public transport information - Ongoing. LTP, Congestion Strategy. Quality Bus Partnership. Continued investment.	Public transport information	Ongoing				1	1	2
144			Subsidised bus fares	Subsidised bus fares - Ongoing. LTP Accessibility Strategy. Concessionary fares; 'Travel Aid' Scheme	Subsidised bus fares	Ongoing			1	1	1	3



144				Improved bus facilities and circulation - LTP Congestion Strategy. Quality Bus Partnership. Bus shelters	There is a comprehensive bus service by three main companies during the working day Monday to Saturday. This is rather patchy and infrequent in the evenings and on Sundays. The council financially supports a number of noncommercial services. The city centre is very accessible by bus during the morning peak (7:30am to 9:30am) as 87.2% of Leicester's households, without cars, are within 400 metres of a bus stop offering a 30 minute journey time by bus into the centre and, 97.8% have similar access to a bus offering a 45 minute journey time (based on the October 2009 network)	Ongoing					1	1	2
144				Commissioning additional bus services - Not yet assigned, LTP Accessibility Strategy. Dependent on new funding streams, e.g. from DPE	Commissioning additional bus services	Ongoing					1	1	2
144				Off bus ticketing - Late LTP, LTP-2 Congestion Strategy. Via Quality Bus Partnership. Programme driven by roll-out of Quality Bus Corridors.	Off-bus ticketing / zonal fares	Ongoing					1	1	2

144				Quality bus contracts - Uncertainty and perceived risk for bus operators. Inadequate scope of existing legislation. Revenue funding costs. Adverse impact on competition (questionable). Adverse service effects from adoption of "lowest cost" bidder. Success of existing Quality Bus Partnership in rolling out package of improvements.		Not implemented				1	1	2
144			Electric / guided buses and trams	Electric / guided buses and trams - High infrastructure cost. Significant disruption costs during construction. Unavailability of appropriate corridor widths. Long delivery time. Questionable impact on car usage, from preliminary experience elsewhere.		Reinvestigating feasibility of trams			1	1	1	3

144		Travel Plans	Travel Planning - Late LTP, LTP Congestion Strategy. Council corporate scheme under development in 2005. Planning process will require for all commercial development. 100% of schools to be covered by 2011. Will contribute 5% reduction in peak commuter travel by 2011	Travel planning	Ongoing			1	1	1	3
144		Council to encourage and promote home working	Council home working and flexible hours - Development and rollout in progress. Extended flexible hours in some Divisions. Provision of IT equipment for use at home with access to central servers via CITRIX software.	Council home working and flexible hours	Ongoing			1	1	1	3
144		Safer routes to school (Breathe Easy)/exclusion zones	Safer routes to school - Ongoing. LTP Safer Roads Strategy. Safety, health and social inclusion benefits.	Safer routes to school	Ongoing			1	1	1	3
144		School 'walking buses'						1	1	1	3
144		School 'yellow bus' scheme						1	1	1	3

144			Promote/facilitation cycling	<p>Cycling – promotion and facilitation - Ongoing. LTP Congestion / Accessibility Strategies. Healthy and flexible mode of transport. Campaign of marketing and promotion in LTP-2. Extension of current 60 mile signed cycle route network. Current low numbers cycling mean that a substantial increase will only have a small effect on congestion.</p>	<p>The East Midlands Personal Travel Survey told us that 29% of the 1,045 sample Leicester households had access to a bike while the average journey was 1.9 miles. We have seen an 81% increase in cycling in Leicester since 2004. National census and school travel plan information data for Leicester suggests a growing popularity of cycling and a significant suppressed demand, particularly amongst young people. There are already more than 60 miles of signed cycle routes across the city which the Cyclists' Touring Club's cycle benchmarking exercise confirmed as being high quality. However, there is a disparity of off-road/quiet route provision between the western and eastern halves of the city: the west side being much better served. A key objective is to complete NCN 77 the 'Green Ringway'. This part-completed orbital route will be finished, either using existing quiet roads or new sections of off-road route. The Green Ringway mirrors the route of the Outer Circle bus route. We have expanded our work with schools, employers and adult training organizations to ensure that new (and returning) cyclists have access to affordable cycle training that meets the new National cycle standards. In 2009/10 we provided cycle training for 1,300 school children and 750 adults.</p>	Ongoing			1	1	1	3
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144			Promote/facilitation walking	Walking – promotion and facilitation - Ongoing. LTP Congestion / Accessibility Strategies. Health / Social Inclusion benefits Campaign of marketing and promotion in LTP-2. Walking often an element in longer journeys: Improvement in walking routes/facilities programmed.	Walking is a healthy and important method of getting around, as well as being an element of most other journeys e.g. walking to/from bus stops or car parks. Ensuring well surfaced, lit and signed links to schools, local shops, health care facilities and employment areas – both through footways, crossing points and the networks of public Rights of Way and permissive paths owned by the council – has been a priority over the last two local transport plan periods. Child pedestrian training is provided to school children. Promotional campaigns such as 'Let's Walk Leicester' are run in conjunction with local health campaigns to reduce the number of Leicester residents who are overweight through inactivity.	Ongoing			1	1	1	3
193			<b>Draft AQAP July 2005</b>	<b>AQAP1 April 2006</b>	<b>Draft AQAP2 July 2013</b>	<b>Overall progress</b>						
193	Oxford City Council	Measures for Reducing Emissions from Buses and HGV's	LEZ (Buses, Coaches & HGV's); LEZ (5.7(a) plus all other vehicles)	Low Emission Zone		Bus LEZ to be implemented 2014	1		1	1	1	4
193			Statutory Engine Switch-Off	Adopt statutory powers to request drivers to switch off vehicle engines		Complete	1		1	1	1	4
193			Roadside Testing	Adopt statutory powers for roadside testing of emissions		Not reported			1	1	1	3
193			Bus Quality Partnership: - All buses to Euro 3 - Cross-operator Ticketing	Bus Quality Partnership	July 2011: Cross-operator ticketing introduced, reductions in bus numbers on key routes	Complete	1		1	1	1	4

193	Improving Traffic Management And Reducing Congestion	Bus Gate Enforcement	Bus Gate Enforcement	April 2007: High Street Bus Gate Enforcement (up to 25% reductions in non-bus traffic)	Complete	1		1	1	1	4
193		Traffic light location and phasing	Improved phasing of traffic lights on bus priority route (BPR) and key radial routes into Oxford		Not reported	1		1	1	1	4
193		Freight Quality Partnership - All HGV's to Euro 3 - Transhipment Centres	Review of commercial delivery times Freight Quality Partnership	Reducing freight emissions	Ongoing			1	1	1	3
193		Bus Quality Partnership: - All buses to Euro 3 - Cross-operator Ticketing	Bus Quality Partnership. Advanced bus ticketing	July 2009: Transform Oxford, relocation of bus-stops from Queen Street	Ongoing	1		1	1	1	4
193		Review of Parking	Review of On-street Parking in Central Oxford		Not reported			1	1	1	3
193		Review of Parking	Review of city centre parking policy		Not reported			1	1	1	3
193	Encouraging The Use Of Public Transport		Development of bus priority improvements On radial routes into Oxford		Not reported	1		1	1	1	4
193			Residents/Controlled parking zones In residential areas		Not reported			1	1	1	3
193		Work Place Travel Plans; School Travel Plans	Travel Plans – School and Workplace In all County Schools; and most major employers		Not reported			1	1	1	3
193											

193	Measures Outside The AQMA Aimed At Encouraging The Use Of Public Transport		A40 Green Road congestion improvements		Not reported	1		1	1	1	4	
193			Intelligent Transport Systems		Not reported	1		1	1	1	4	
193			Thornhill P & R interchange		Not reported	1		1	1	1	4	
193			Marston Rd bus gate		Not reported	1		1	1	1	4	
193			Bus Lane enforcement cameras/radial routes		Not reported			1	1	1	3	
193			Kidlington Premium Route public transport enhancement		Not reported			1	1	1	3	
193			Eynsham Premium Route (Ph1) public transport enhancement		Not reported			1	1	1	3	
193			Real Time Information System for public transport		Not reported			1	1	1	3	
193			Rail Stations Development		Not reported			1	1	1	3	
193			Oxford Southern approaches bus priority		Not reported	1		1	1	1	4	
193			Oxford – Bicester A34/A41 bus priority and remote P&R		Not reported	1		1	1	1	4	
193			Cycling and Walking	Fairfax Rd/Purcell Rd cycle link		Not reported			1	1	1	3
193			Cycling and Walking	Marston Road cycle measures		Not reported			1	1	1	3
193			Cycling and Walking	Thames towpath cycle route		Not reported			1	1	1	3
193			Cycling and Walking	Headington pedestrian/cycle measures		Not reported			1	1	1	3

193			A40 north of Oxford congestion improvements		Not reported	1		1	1	1	4
193		Taxi Quality Partnership - All Taxis to Euro 3	Taxi Quality Partnership		Not reported	1		1	1	1	4
193	Other Measures	Cycling and Walking	High Street including pedestrian and safety measures Cycle network improvements including HAMATS programme Fairfax Road cycle link Marston Road cycle improvements Thames Towpath pedestrian/cycle Link The Plain Roundabout cycle safety improvements	August 2009: 20mph zones introduced	Ongoing			1	1	1	3
193	Draft AQAP	Car Clubs			Not reported						0
193		High Volume Occupancy			Not reported	1					1
193		Scrappage schemes			Not reported	1					1
193		Retro-fitting			Not reported	1					1
193		Cleaner Fuels		July 2010: First diesel electric hybrid buses introduced in Oxford	Ongoing	1					1
193				A city-wide sustainable travel strategy	New measure						0
193				Support for the uptake of low and zero emission vehicles	New measure						0
193				Planning for sustainable transport	New measure						0
193				Managing the Council's transport emissions	New measure						0
222		Interim draft AQAP February 2005	Draft AQAP1 June 2007	AQAP1 Sept 2009							



222	Sandwell MBC	Oldbury Ringway/Birmingham Road (A457), Oldbury	Remove receptors by Compulsory purchase order.	The council will consider the possible relocation of existing residential properties	The council will consider the possible relocation of existing residential properties	Not yet implemented			1	1	1	3
222				Red route treatment - Red Route treatment including the control of parking which would ease congestion (predicted 10% reduction) but there is no obvious place to displace residential parking	Red route treatment - Red Route treatment including the control of parking which would ease congestion (predicted 10% reduction) but there is no obvious place to displace residential parking	Completed	1		1	1	1	4
222		Dudley Road East/Roway Lane, Oldbury		Red route improvements	Red route improvements	Completed	1		1	1	1	4
222		M5 J1-J2, Oldbury & West Bromwich & M6 J7-J8/M5, Great Barr & Yew Tree	Improvements to traffic flow on M6 by implementing a programme to reduce incident response times to 20 mins (from 60mins)	Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week - Completed	Improvements to traffic flow on M6 through implementing a programme to reduce incident response times to 20 minutes (from 60 minutes) 24 hours a day, seven days a week - Completed	Completed			1	1	1	3
222			Implement an improved system of contingency planning for the motorway network to improve traffic flows	Implement an improved system of contingency planning for the motorway network to improve traffic flows - Completed	An improved system of contingency planning for the motorway network has been implemented to improve traffic flows - Completed	Completed	1		1	1	1	4

222			Evaluate the suitability of active traffic management to improve traffic flows on the M6	Evaluate the suitability of active traffic management to improve traffic flows on the M6 - Ongoing	Evaluate the suitability of active traffic management to improve traffic flows on the M6 - Ongoing	Completed	1		1	1	1	4
222				A link is planned between the M54 and the M6 / M6 Toll this will relieve congestion on the M6 Junction 8 to 10A.	A link is planned between the M54 and the M6 / M6 Toll this will relieve congestion on the M6 Junction 8 to 10A.	Not yet implemented	1		1	1	1	4
222				Ramp metering of junctions (M5 (J1 + 2) and M6 (J11 +16))	Ramp metering of junctions (M5 (J1 + 2) and M6 (J11 +16)) - Trial completed at M5 J1 in 2008 further trials to be carried out	Ongoing			1	1	1	3
222		Newton Road/Birmingham Road (A34), Great Barr	Route 51 improvements - these proposals include a package of road improvements and traffic control systems that are predicted to improve the flow of traffic along the A34 in the vicinity of Junction 7 of the M6. It also proposes improvements in the bus service to bring them up to the bus showcase route standards being developed across the West Midlands.	Route 51 improvements – the council will continue to implement a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards	Route 51 improvements – a programme of works to improve traffic flows and reduce queue lengths. The package includes red route treatment, road improvements, traffic control systems and improvements in the bus service to bring them up to the bus showcase route standards - Completed	Completed	1		1	1	1	4
222				Future Metro Phase 2 – Varsity North	Future Metro Phase 2 – Varsity North	Not yet implemented			1	1	1	3
222		URoads		Bus Showcase	Bus Showcase	Completed			1	1	1	3

222			Pavement trial – monitor outcome of trial for potential application along Bearwood Road - Ongoing	Photocatalytic Paving – currently suspended due to poor results in the trial carried out by Camden Council - Suspended pending further research	Not implemented			1	1	1	3
222			Future Metro Phase 2 - Birmingham West Route along Hagley Road West	Future Metro Phase 2 - Birmingham West Route along Hagley Road West	Not yet implemented			1	1	1	3
222			Red route along Hagley Road	Red route along Hagley Road	Completed	1		1	1	1	4
222	Oldbury Road / Birmingham Road, Blackheath		Blackheath Bypass was completed in 2006, the council will implement traffic management scheme to maximise the use of the bypass. As a result of the bypass and Traffic Management proposals a reduction of 40% may be achieved	Blackheath Bypass was completed in 2006, the council will implement traffic management scheme to maximise the use of the bypass. As a result of the bypass and Traffic Management proposals a reduction of 40% may be achieved	Completed	1		1	1	1	4
222			Close roads in Blackheath town centre for "In Town Without my Car Day"	Close roads in Blackheath town centre for "In Town Without my Car Day"	Not yet implemented	1		1	1	1	4
222	High Street / Powke Lane, Blackheath		Possible Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Possible Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Not implemented	1		1	1	1	4

222	Bromford Road, West Bromwich		Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Ongoing	1		1	1	1	4
222	Trinity Way / Kenrick Way, West Bromwich		Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Ongoing	1		1	1	1	4
222	All Saints Way / Expressway, West Bromwich		Junction improvements will provide a vehicle underpass along the line of the A41 beneath the existing roundabout. The junction will also have bus priority measures.	Junction improvements will provide a vehicle underpass along the line of the A41 beneath the existing roundabout. The junction will also have bus priority measures.	Ongoing	1		1	1	1	4
222	All Saints Way / Newton Road, West Bromwich		Red Route (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Red Route (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Completed	1		1	1	1	4

222	Sedgley Road East / Dudley Port, Tipton		Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Not yet implemented	1		1	1	1	4
222	Soho Way/Grove Lane / Cranford Street, Smethwick		Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Implement Red Route Treatment (may include side road entry treatments, new/revised traffic signals and new/revised stopping, loading and parking restrictions)	Not yet implemented	1		1	1	1	4
222	Improving Public Transport to Reduce Traffic Volumes	Showcase and Super Showcase route extension and improvements	Showcase route extension and improvements (not all route funding secured). - Ongoing	Showcase route extension and improvements (not all route funding secured). - Ongoing	Not yet implemented			1	1	1	3
222		Improvements of branding to increase attractiveness of public transport	Improvements of branding to increase attractiveness of public transport - Ongoing	Improvements of branding to increase attractiveness of public transport - Ongoing	Not yet implemented			1	1	1	3
222		Improving access to information regarding transport options	Improving access to information regarding transport options - Ongoing	Improving access to information regarding transport options - Ongoing	Not yet implemented			1	1	1	3
222		Promote Midland Metro extension (Wednesbury – Brierley Hill due to be open 2005/06) and investigate use of Stourbridge – Walsall freight line for passenger rail and local park & ride. (T6)	Promote Midland Metro extension (Wednesbury to Brierley Hill)	Promote Midland Metro extension (Wednesbury to Brierley Hill)	Not yet implemented			1	1	1	3

222	Improving the Road Network to Reduce Congestion		Future Metro Phase 2 – 5W's. Wednesbury to Walsall Varsity North – A34 Birmingham to M6 Junction 7 Birmingham West – Birmingham to Quinton.	Future Metro Phase 2 – 5W's. Wednesbury to Walsall Varsity North – A34 Birmingham to M6 Junction 7 Birmingham West – Birmingham to Quinton.	Not yet implemented			1	1	1	3
222		Developers will be required to include or fund measures to provide an efficient bus service (T5).	Increased bus lane enforcement (increase number of cameras on buses for bus lane enforcement) - Ongoing	Increased bus lane enforcement (increase number of cameras on buses for bus lane enforcement) - Ongoing	Not yet implemented			1	1	1	3
222		Introduction of Red Routes to ease congestion	Introduction of Red Routes to ease congestion - Ongoing	Introduction of Red Routes to ease congestion - Ongoing	Not yet implemented	1		1	1	1	4
222		Improvement of Traffic Urban Control Systems designed to reduce congestion	Improvement of Traffic Urban Control Systems designed to reduce congestion - Ongoing	Improvement of Traffic Urban Control Systems designed to reduce congestion - Ongoing	Not yet implemented	1		1	1	1	4
222			Burnt Tree Island improvements	Burnt Tree Island improvements	Ongoing	1		1	1	1	4
222			Owen St crossing	Owen Street crossing	Completed			1	1	1	3
222			Cradley Heath Bypass	Cradley Heath Bypass - Completed	Completed	1		1	1	1	4
222	Using Area Planning Methods to Reduce Traffic Volumes and Exposure	Developers will be required to encourage other forms of transport and demonstrate how their proposals will do this.			Not reported			1			1
222		Developments that could generate high public transport use should be located within 400m of public transport interchanges.			Not reported			1			1

222			Flexible approach to car parking at residential developments to enable reduced parking provision where low car ownership groups.			Not reported				1				1
222			Support use (reopening) of Stourbridge – Walsall line for rail freight.	Support use (reopening) of Stourbridge – Walsall line for rail freight - Ongoing	Support use (reopening) of Stourbridge – Walsall line for rail freight - Ongoing	Not yet implemented				1	1	1		3
222				Ensure AQ considerations are included in the new Local Development Framework - Ongoing Ensure policies seek to reduce the need to travel and promote the use of modes other than the car - Ongoing	Ensure AQ considerations are included in the new Local Development Framework - Ongoing Ensure policies seek to reduce the need to travel and promote the use of modes other than the car - Ongoing	Ongoing				1	1	1		3
222				Section 106 – Investigate the practicability of S106 agreements being used to secure monitoring funding and balancing measures in applications where AQ is an issue (section 106 agreements are to be replaced in the future with two new routes which together are designed to have the same effect as section 106 does now, the provisions retain the existing	Section 106 – Investigate the practicability of S106 agreements being used to secure monitoring funding and balancing measures in applications where AQ is an issue (section 106 agreements are to be replaced in the future with two new routes which together are designed to have the same effect as section 106 does now, the provisions retain the existing	Ongoing				1	1	1		3

				negotiated route while also providing for a set contribution payable by developers). - Ongoing									
222				AQ guidance - Provide guidance in relation to air quality for developers to follow when submitting planning applications - Ongoing	AQ guidance Provide guidance in relation to air quality for developers to follow when submitting planning applications - Ongoing	Not yet implemented			1	1	1		3
222				Congestion charging – the council will continue to monitor the implications and effectiveness of any congestion charging proposals - Ongoing	Congestion charging – the council will continue to monitor the implications and effectiveness of any congestion charging proposals	Not yet implemented			1	1	1		3
222				Development Control – continue to consider air quality issues for new planning applications in line with the agreed planning protocol - Ongoing	Development Control – continue to consider air quality issues for new planning applications in line with the agreed planning protocol - Ongoing	Ongoing			1	1	1		3



222	Reducing Vehicle Emissions	Progressively "green" the Council fleet	Improve the council fleet by – Where possible any new SMBC vehicles purchased are to Euro 4 standard - Ongoing Monthly fuel reports are produced and regular user group meetings held to try and improve efficiency - Ongoing	Improve the council fleet by – Where possible any new SMBC vehicles purchased are to Euro 4 standard - Ongoing Monthly fuel reports are produced and regular user group meetings held to try and improve efficiency - Ongoing	Ongoing	1		1	1	1	4
222		Improve efficiency of vehicle use									
222			Promote Eco-Driving – develop promotional strategy to encourage drivers to drive economically	Promote Eco-Driving – develop promotional strategy to encourage drivers to drive economically	Ongoing			1	1	1	3
222			Develop strategy to encourage drivers not to allow their engines to idle when parked	Develop strategy to encourage drivers not to allow their engines to idle when parked	Not yet implemented			1	1	1	3
222			Establish a programme of vehicle emission testing	Establish a programme of vehicle emission testing	Not yet implemented			1	1	1	3
222		Reducing Air Pollution from Industry, Commerce and Residential Areas	Continue Black Country Energy Efficiency Advice Centre	Continuation of Sandwell Energy Efficiency Advice Centre - Ongoing	Continuation of Sandwell Energy Efficiency Advice Centre - Ongoing	Ongoing			1	1	1
222			Improvement of the energy rating of dwellings. The Warm Zone Scheme provides general energy efficiency advice and installation of energy efficiency measures. - Ongoing	Improvement of the energy rating of dwellings. The Warm Zone Scheme provides general energy efficiency advice and installation of energy efficiency measures. - Ongoing	Ongoing			1	1	1	3

222	Changing Levels of Travel Demand / Promotion of Alternative Modes of Transport	Promotion of walking	Promotion of Walking - Ongoing	Promotion of Walking - Ongoing	Ongoing			1	1	1	3
222		Promotion of Cycling	Promotion of Cycling - Ongoing	Promotion of Cycling - Ongoing	Ongoing			1	1	1	3
222		Encourage travel Plans for employers, schools & hospitals	Encourage travel plans for employers, schools & hospitals - Ongoing	Encourage travel plans for employers, schools & hospitals - Ongoing	Ongoing			1	1	1	3
222			Air Quality Monitoring - Ongoing: • Reporting of results and publicity • Produce annual reports and publish results • Regularly review suitability of monitoring	Air Quality Monitoring - Ongoing: Reporting of results and publicity Produce annual reports and publish results Regularly review suitability of monitoring	Ongoing			1	1	1	3
222			Air Quality info on website: • Publish AQ action plan on web and develop other service information - Ongoing	Air Quality information on website: Publish AQ action plan on web and develop other service information - Ongoing	Ongoing			1	1	1	3
222			Promote car sharing among residents and businesses in the area - Ongoing	Promote car sharing among residents and businesses in the area - Ongoing	Not yet implemented			1	1	1	3
222				Provide air quality information and promote sustainable transport in schools - Ongoing	Ongoing			1	1	1	3

### **Appendix 13: LAQM consultation - UWE response**

The Air Quality Management Resource Centre at the University of the West of England (herein AQMRC, UWE) has many years of experience working directly with and for local government in assisting them with their statutory Local Air Quality Management (LAQM) duties, appraising Review and Assessment reports and Further Assessments, and also in disseminating Continuing Professional Development training on LAQM to local authorities and environmental consultancies. AQMRC has been involved in the development of LAQM since its inception and has been central to the development of statutory and non-statutory guidance, both directly and through consultation responses, including for the repeal of Further Assessments. Over the last 15 years, AQMRC has undertaken extensive primary research and published widely on the LAQM process, its strengths and weaknesses. AQMRC is therefore fully versed on the role of LAQM and these opinions are based on direct experience and on those experiences recounted by local authorities with whom we have worked. AQMRC is also currently assisting the European Commission with the review of the Air Quality Directive and so is well-placed to recognise the importance of LAQM to national air quality policy in achieving the EU Limit Values.

Our responses to each of the consultation questions are presented below. In outline our views are that:

- LAQM needs to be reinvigorated and its public health protection purpose restated and prioritised.
- The Air Quality Regulations need to be updated and aligned more explicitly with EU Limit Values.
- The Air Quality Strategy needs to be reviewed and updated redefining the contributions of national and local actors.
- Local Authorities need support and encouragement to implement Action Plan measures.
- Review and Assessment, the diagnosis of air quality problems or improvements, is an essential precondition for effective and targeted action to improve air quality, and its evaluation. It must therefore be retained although the current administrative arrangements could be improved.

- In support of public health improvements, Government (both national and local) needs to achieve greater internal coordination of departmental actions and to deploy these interventions more effectively.
- Local authority actions can contribute to meeting EU limit values, but the means by which this is reported needs careful consideration.

AQMRC has published extensively on the LAQM process since 1996 and some of our relevant publications are listed at the end of this response. These chart the evolution of the process and helped identify many of the opportunities, concerns and challenges of air quality management in the UK and further afield.

### **1. What are your views on whether we should consolidate EU and National Air Quality Objectives and how this might best be achieved?**

In the considered opinion of the AQMRC, consolidation of the EU limit values and the national air quality objectives may be an appropriate strategy, insofar as these then reflect the public health protection evidence. There are notable differences in the pollutants, averaging periods and timescales for achievement between the Air Quality England Regulations and the Air Quality Standards Regulations that would need to be considered, e.g. the 15-minute objective for SO<sub>2</sub> is not reflected in the transposition of the EU limit values, but has significant health implications and as a result has been the subject of seven AQMA declarations in England.

There are also discrepancies between the applicability of the EU limit values and national air quality objectives in terms of relevant public exposure. Clarification would be required for local authorities on how to determine relevant exposure, given that the EU Air Quality Directive is less prescriptive than LAQM guidance on how exposure is related to the different averaging periods of objectives/limit values, assuming this is not changed in the Air Quality Directive review.

To ensure a coordinated approach across the UK it is essential that this process of consolidation should be undertaken in the context of a revised national air quality strategy.

### **2. What are your views on the range of objectives local authorities should work towards and whether or not these should be reduced?**

The range of pollutants that local authorities are required to work towards, as currently prescribed in the national air quality objectives, are based on the risk of public health

effects. For many local authorities, most of these pollutants and objectives have effectively been 'screened out' in previous rounds of Review and Assessment, however given that the role of local authorities is to ensure concentrations of pollutants remain below the objectives, it is essential that a mechanism is retained to ensure local assessment of potential new sources and concentrations of all pollutants remain below health-based thresholds. This currently represents a minimal burden on local authorities through existing Review and Assessment reporting and there is therefore no gain to be made in reducing this aspect.

As described in the response to Q1 above, there are pollutants that are included in the air quality objectives but that are not represented in the EU limit values. It is clear that where there are local exceedences, or near exceedences of these objectives, these pollutants should be retained.

There are also pollutants reflected in the limit values that are not currently included in the air quality objectives for which local authorities should give consideration, e.g. PM<sub>2.5</sub>. Particularly given potential increases in these pollutants resulting from local biomass combustion consideration should be given as to how these are passed on to LAs.

As mentioned in the response to Q1 above, any change to the air quality objectives that local authorities are required to work towards achieving should be preceded by a revised national air quality strategy for the UK which clearly sets out the national context of any required local actions.

**3. What contribution can local authorities make in reducing emissions and/or concentrations from PM<sub>2.5</sub> pollution? Please provide examples, where appropriate.**

Typically, any local authority measure that is targeting PM<sub>10</sub> or NO<sub>2</sub> from traffic will also be relevant to PM<sub>2.5</sub>. However, given the point made in Q2 above regarding potential new sources for this pollutant, it may be appropriate for local authorities to have some explicit responsibility for managing local contributions to PM<sub>2.5</sub>, particularly given that there is no safe health threshold for fine particles.

**4. Which option will best help to support Aim 1?**

In the opinion of AQMRC, none of the proposed options would be recommended to support Aim 1. However, an adaptation of Option 2 would enable the consolidation of EU limit values and national air quality objectives, while still retaining the ability for local

authorities to identify any local sources that may give rise to pollutants outside of this remit. As previously stated, any amendment to the Regulations would necessitate the revision of the national air quality strategy for the UK.

**5. What are your views on how cooperation between different tiers of local authorities can be supported?**

A statutory duty to improve air quality on all local governments, regardless of tier, is necessary particularly for those departments whose policies may influence air quality to ensure that these policies and practice do not worsen air quality where there is an exceedence, and for these departments to take responsibility for ensuring that they actively reduce pollutants to below the exceedence thresholds. These statutory duties must be clear, achievable and enforceable, and must be upheld by national departments, e.g. DfT, and not contradicted by other political imperatives. In order to ensure roles and responsibilities are explicit, a revised national air quality strategy is required.

**6. Do you have evidence of where joint working has been effective and what has helped to achieve this or where it has been less effective in supporting action to improve air quality?**

Extensive research undertaken by AQMRC (Olowoporoku *et al.*, 2010; Olowoporoku *et al.*, 2011; Olowoporoku *et al.*, 2012) has found a large degree of disjuncture between Environmental Health and Transport departments' attitudes to air quality management, with many Transport departments treating air quality as a tick box exercise in LTPs in practice, severely undermining the effectiveness of this approach to improving local air quality.

**7. Do you think there is a need to review the allocation of responsibility for air quality between District and County authorities?**

As discussed under the response to Q5 above, both County and District level authorities should have a statutory duty to improve air quality, preferably at a strategic level to ensure there is political buy-in from Members. The problem is less to do with the division of tasks between tiers, but the divisions of responsibilities between transport and environment departments (and therefore a factor that is also applicable within Unitary authorities). All departments that implement policies that may influence air quality must be made responsible for ensuring not only that these policies do not worsen air quality or introduce new exposure to areas with exceedences, but that they

actively contribute to improving air quality. As discussed in response to Q5 above, this should be ensured through the publication of a revised national air quality strategy.

#### **8. Which option will best help to support Aim 2?**

Of the proposed options, the AQMRC consider Option 2 to be preferable for supporting Aim 2. However, it is recognised that the roles and responsibilities of national government departments regarding air quality management need to be explicit and communicated clearly to their respective departments at a local level. This may require alignment with EU limit values, which should be achieved through the publication of a revised national air quality strategy.

#### **9. What are your views on the current air quality reporting requirements for local authorities and how they could be simplified?**

While it is recognised that there is scope for reducing the reporting burden on local authorities, it is a mistake to presume that local authorities' Review and Assessment activities are the limiting factor in implementing local air quality Action Plans. There are many factors that undermine the effectiveness and efficiency of Action Planning and limited resources are only a small part. Other more influential factors include the lack of a statutory requirement to achieve the air quality objectives (which is not considered in this consultation document, but which undermines political will to rate air quality in relation to other political pressures e.g. economic development) and that the responsibility for LAQM is housed in Environmental Health departments rather than with those that have an ability to manage the pollution source.

It is vital to retain a statutory requirement for local reporting on air quality in order to ensure continued monitoring at a local level. Without local monitoring, there is no accurate measurement of local concentrations, and no continual trend data against which to assess the implementation of local measures to reduce pollution or to assess the public health impact. It has already been shown that the national monitoring and modelling as reported to the European Commission is unable to adequately capture the local hotspots that local authority monitoring has identified rendering local monitoring essential. Detailed and up-to-date air quality information is also the most important tool in a local authorities' armoury when it comes to challenging new polluting developments. Without the information provided by regular review and assessments it would be very hard to argue for appropriate mitigation measures to be incorporated in developments and air quality would be likely to worsen as a result.

It is recognised that in reducing the burden on local authorities and ensuring efficient use of limited resources, reporting could be simplified, and the proposed single annual technical progress report is recommended, supported by a short, non-technical summary aimed at the public (see response to Q10 below).

**10. Do you think there is a need for a more public facing local air quality report which provides an annual review of action taken to improve air quality?**

The technical report should not be 'dumbed down', but we recognise the importance of public engagement and local authorities should produce a separate short, non-technical public communication document that notifies members of the public (particularly vulnerable groups, and those who may be responsible for the highest emissions) about the quality of local air and the potential health impacts, linked to public health data for their local areas.

**11. Do you think there is a need for a better line of sight between local reporting on air quality and what we report to the EU about local action?**

Action taken at a local level should be reported to the EU, but so should locally-measured concentrations. This recommendation accords with the European Stakeholder Engagement Group recommendation to align local and national reporting, a review of which was undertaken by UWE as part of a consortium assisting the European Commission with the Air Quality Directive review. There also needs to be a clear identification of responsibilities at a national level and departmentally at a local level, which should be made explicit in a revised national air quality strategy.

**12. Do you think the current arrangements for AQMAs should be retained or should they be removed and/or local authorities given more flexibility in applying them?**

AQMAs must be retained as basis for development control. In many local authorities, AQMAs act as the trigger for identification of developments that may require an air quality assessment and provide some degree of protection against developments that may worsen air quality or introduce exposure at these locations. If anything, AQMAs should be more standardised rather than the *ad hoc* approach that currently exists whereby one authority may only include the relevant exposure (not even the area of technical exceedence in some cases), and a neighbouring authority may have declared a whole borough/district AQMA.



Additionally, the declaration of an AQMA is often major signifier of institutional recognition that an air quality problem exists. At the point of declaration it often becomes much easier for cross-departmental communication, and appropriate allocation of resources to occur.

This may even be an opportunity to radically rethink how AQMAs are identified. Given the availability of public health data by postcode it should be possible to identify postcodes where vulnerability to poor air quality is relatively high in relation to measured/modelled concentrations of pollutants. These areas should be targeted for improvements to air quality in order to provide the greatest public health impact.

### **13. Which option will best help to support Aim 3?**

AQMRC considers that Option 2 is the preferred proposed option to best support Aim 3. Option 3 would not be appropriate in achieving this aim as a statutory duty to maintain local reporting is essential to ensure the continuation of local monitoring in order to accurately assess concentrations of pollutants for the purposes of public health assessment and progress against measures to improve local air quality.

### **14. Would the availability of information on evidence based measures to improve air quality or reduce exposure help in developing local action plans?**

Quantifiable evidence for implementation of measures should be shared to support local authorities producing Air Quality Action Plans. Likewise, any data/tools devised for one local authority that may be applicable in others should be made more widely available.

### **15. Do you have examples of good practice on the implementation of measures to improve air quality or to communicate on air quality?**

The EU FP5 INTEGAIRE project, in which UWE played a major role, undertook a major EU wide review of air quality related measures. Its reports and accompanying good practice database provide a good example of existing evidence representing good practice across Europe (including the UK).

(<http://euronet.uwe.ac.uk/www.integaire.org/home.html>). See also:

Guide for Cities

<http://euronet.uwe.ac.uk/www.integaire.org/project/Guide%20for%20Cities.pdf>

Database of examples: <http://euronet.uwe.ac.uk/www.integaire.org/database-new/gpdb.php?m=0>

General contents page: <http://euronet.uwe.ac.uk/www.integaire.org/Project.html>

**16. Which option do you think is most likely to improve local air quality management and why? Do you have an alternative approach?**

Of the four options proposed, Option 2 is considered to be most likely to improve air quality management, provided that all parties are clear on their roles and responsibilities and that there is a strong national lead not to undermine local action, i.e. by accepting increasing road transport. This can only be achieved in the context of a revised national air quality strategy for England and the Devolved Administrations to completely re-evaluate and re-contextualise the balance of local and national action.

**17. Are any of the options and their proposed changes to regulation, guidance and reporting likely to adversely impact on air quality, if so to what extent?**

Options 3 and 4 are likely to potentially worsen local air quality impacts through their disregard of local hotspots; although there will be no local monitoring available to quantify the effect on air quality, public health may suffer. It is unlikely that Option 1 or 2 will lead to an improvement in air quality (or necessarily prevent a worsening) without significant national action and national support for local action, which should be made explicit in a revised national air quality strategy.

**18. Assuming no local air quality management requirements existed as proposed in Option 4 to what extent would local incentives and pressures from public health and amenities be sufficient to support local action to improve air quality?**

AQMRC, UWE are wholly against the proposed Option 4. It is entirely unlikely that local pressure would be sufficient to support local action to improve air quality. Most members of the public do not currently appreciate the extent that poor air quality is affecting their health, or the role that local authorities are taking to protect them. Given the largely invisible nature of air pollution from road traffic, even a worsening of air quality resulting from the removal of LAQM would probably not be noticed as being directly related to any worsening in health effects.

Even with a statutory duty to act in pursuit of the air quality objectives, very little is actually done at a local level to improve air quality. Without this statutory duty it is hard to see how public pressure could achieve any more.

## Appendix 14: Published papers

Appendix 14. Paper 1: Paper accepted as part of the proceedings at the 21st International Conference on Modelling, Monitoring and Management of Air Pollution 2014. Siena, Italy. 3-5 June 2013.

### **Is Local Air Quality Management a successful strategy in achieving selected EU limit values?**

J. H. Barnes, E. T. Hayes & J. W. S. Longhurst

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**Appendix 14. Paper 2: Barnes, J. H., Hayes, E. T., Chatterton, T. and Longhurst, J. (2013)**  
**Air quality action planning: Why do barriers to remediation in local air quality**  
**management remain? *Journal of Environmental Planning and Management*. pp. 1-22.**  
**ISSN 0964-0568**

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**Appendix 14. Paper 3: Barnes, J. H., Hayes, E. T. & Longhurst, J. W. S., (2012). Air quality action planning: the failure of remediation in local air quality management. In Brebbia, C., & Longhurst, J.W.S. (Editors), Air Pollution XX, WIT Press. Southampton and Boston, pp.**

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**Appendix 14. Paper 4: Barnes, J. H., Chatterton, T. J., Hayes, E. T., Longhurst, J. W. S., Olowoporoku, A. O. (2011). Assessing the potential for local action to achieve EU limit values. In Brebbia, C., Longhurst, J.W.S. & Popov, V. (Editors) Air Pollution XIX WIT Press.**

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