

# **PLANNING FRAMEWORKS FOR MANAGING AIR QUALITY IN URBAN AREAS – THE UK EXPERIENCE**

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## **ABSTRACT**

Road transport is a major source of local air pollution in UK towns and cities. Road traffic accounts for over half of nitrogen oxides emissions and over 75% of all locations identified as at risk of failing to meet national air quality targets. A quarter of UK local authorities have declared air quality management areas (AQMA) as a result of predicted exceedences of the nitrogen dioxide and particulate matter (PM<sub>10</sub>) UK objectives. A local authority has a statutory duty to develop an Air Quality Action Plan to mitigate local air quality problems found.

National and local transport policy measures will be required to bring about improvements in local air quality. These will include fiscal measures, regulatory measures and local improvements in public and alternative transport provision. More fundamental to this, however, is the need to ensure that strategic land-use planning and development does not impact on air quality locally, and that air quality is given detailed consideration in all local and regional strategic planning processes.

In the UK, AQMA) have planning implications at the local level, and these are explored within the context of a local authority's statutory duty to work towards meeting the UK air quality objectives. This paper will critically review national and local planning policy (transport and strategic planning) to consider how best the national air quality objectives are to be achieved locally.

## **INTRODUCTION TO UK AIR QUALITY MANAGEMENT**

Prior to the 1990s, air pollution was regulated on a reactive basis [1], and in 1990 a new strategic framework for controlling emissions and improving local air quality in the UK was introduced [2]. This approach introduced the concept of an Air Quality Management Area (AQMA) as a designated zone for air quality improvements to be targeted.

The designation of an AQMA is a statutory requirement of air quality legislation in the UK, where specific air quality objectives are predicted to be exceeded by certain target dates [3]. The spatial location of AQMA) reflects the distribution of population within the UK space, with the less densely populated (and thereby less trafficked) administrative areas of Scotland and Wales having proportionately fewer AQMA). This is also due to lower background concentrations of air pollutants experienced within the northern and western regions of Great Britain (England, including London, Wales, Scotland), with the exception of urban centres where background concentrations of NO<sub>2</sub> and PM<sub>10</sub> from vehicle traffic is elevated [4].

In the UK, most AQMA) have been designated as a result of predicted NO<sub>2</sub> concentrations (see table 1), with more than 96% of local authorities with designated AQMA) doing so for traffic-related emissions.

Table 1. Emission source responsible for air quality objective predicted exceedences [5].

Emission source(s)	% of local authorities
Traffic only <sup>a, b</sup>	74
Traffic mainly (minor contribution from industry) <sup>a, b</sup>	12
Traffic <sup>a, b</sup> and industry <sup>b, c</sup>	5
Industry only <sup>b, c</sup>	4
Traffic <sup>a, b</sup> and construction emission source <sup>b</sup>	1
Traffic <sup>a, b</sup> and domestic source <sup>c</sup>	1

<sup>a</sup> NO<sub>2</sub> objective(s)    <sup>b</sup> PM10 objective(s)    <sup>c</sup> SO<sub>2</sub> objective(s)

Local authorities across the UK are therefore paying particular attention to local and regional transport solutions to resolve the air quality challenges faced.

### THE TRANSPORT CHALLENGE

The problems of ever-increasing traffic volumes, experienced in many countries, is symptomatic of a more dispersed society [6] where land-use planning policy has allowed development out-of-town, resulting in people travelling further to work. With increasing car ownership, rising urban populations and increasing reliance on private vehicles, increasing number of vehicles pose a threat to local air quality. Over 80% of journeys by mileage are made by car in Great Britain, demonstrating a clear need for national and local policy to address this increasing reliance on the car.

The difficulty for central and local governments is to balance public expectations of personal mobility and accessibility with a clean atmosphere that poses no significant risk to public health [7]. However, national policy measures have struggled to address the air quality consequences of the growth in vehicle numbers and mileage travelled. The policy challenge is illustrated by the scale of growth in the number of cars registered in the UK, which increased from 17.4m to 26.7m between 1986 and 2000 [8]. It is not only overall vehicle emissions that are causing a problem. Traffic congestion poses a great threat to local air quality, which may require politically contentious measures such as congestion charging, or other demand management mechanisms, to bring about reduced congestion.

To date, local authorities have been guided on the integration of local air quality management, transport planning and land-use planning through national strategies and guidance [9,10]. Local Transport Plans (LTPs) are the current mechanism by which local highways authorities in England and Wales specify strategies and proposals for transport provision. When LTPs first emerged in 2000, the aim was for the plans to be consistent with appropriate development plans, such that the two should be integrated with each other [11]. One criteria of the development of LTPs is action on climate change, air quality and noise. Air Quality Action Plans are therefore heavily reliant upon the effective delivery of Local Transport Plans: a relationship that is likely to strengthen in future.

### THE PLANNING SYSTEM – CHALLENGES FOR CLEAN AIR

A planning system, which distinguishes broad strategic issues and more detailed (and local) tactical issues, has operated across the UK since the mid-1960s [11]. Since the emergence of a system of Structure Planning (a strategic tier of development planning) in 1968, Local Plans have emerged to provide detailed guidance on land-use at the local authority scale [11]. Local

Plans are adopted by local authorities and seek to provide an overview of local policies for the control of land for specific purposes.

As the new air pollution policy framework emerged in the early 1990s, it was accompanied by a resurgence of planning policy guidance to reflect emerging UK local planning policy and regional planning policy. Air quality began to be recognised as a material planning consideration in government planning policy guidance on town centres and retail developments, transport and planning and pollution control, and a more regional focus to air quality emerged with the development of regional planning guidance [11].

Local planning authorities are required to achieve a balance between economic and environmental considerations in arriving at a decision about a specific proposed development. For this reason, appropriate consideration of factors such as air quality, noise and visual amenity is necessary. In terms of air quality, the impact of a development should be considered in terms of the potential for breaches of the national air quality objectives and EU limit values, together with the impact on any Air Quality Action Plan or Air Quality Strategy implementation and overall degradation in local air quality. The development control functions of a local authority are responsible for considering the individual merits of a particular development, in relation to perceived impact on air quality and many other environmental (or non-environmental) criteria.

Local authorities are therefore encouraged to adopt policies in their Local Plans that encourage the improvement of the locality, which includes the local environment, within their area of jurisdiction. For strategic planners, Planning Policy Guidance on Planning and Pollution Control (PPG23) [12] was developed in 1997, which paid little reference to local air quality management underway across Great Britain. It did, however, provide advice on the relationship between local authority planning responsibilities and statutory pollution control responsibilities of local authorities and other bodies (i.e. Environment Agencies). It considered industrial controls, but failed to provide any substantial guidance as to the inclusion of air quality within local planning processes. An annex of the guidance covered air quality, which makes reference to the EC Directive and air quality standards. Since then, there has been limited guidance on air quality for local authority planners. As a result of this, there is much expected of revised guidance on pollution and planning that is anticipated from government over the coming year. A review of the entire planning system is currently underway, reflecting aspirations of today's government in England and Wales.

Local authority air quality personnel, however, have been provided with formal, more prescriptive guidance, on methods for ensuring air quality considerations are taken into account in both strategic and local planning processes. The Department for Environment, Food and Rural Affairs (Defra), and previous departments, have consistently provided policy guidance for air quality professionals in the form of air quality and planning since the national Air Quality Strategy was first introduced [9,10].

## **METHODS**

To review local and national transport and planning policy, the methods used in this paper are two-fold. The first is one of critical evaluation of primary and secondary sources, with refereed literature considered. Secondly, data from UK local authority air quality reports is used to determine the extent to which air quality policy is infiltrating local planning policy and frameworks.

Data are presented from a number of research projects undertaken by the Air Quality Research Group, U.W.E., Bristol [13], and also from local authority air quality progress reports submitted to Defra and the devolved administrations of the UK. The authors of this paper are responsible for appraising these reports on behalf of the UK governments. As part of the air quality progress report requirement, local authorities are asked to identify any proposed development with the potential to impact on local air quality within the local authority. In addition to this, local authorities are asked to specify local air quality and air pollution policy, if in existence, within the Local Plan. Such policy is examined as part of this paper. To date, almost 100 local authorities in Great Britain have submitted their air quality progress reports to government. Of these, 80 are examined for evidence of air quality policy inclusion within Local Plans.

## RESULTS

From a consideration of the 80 local authority air quality progress reports, 27 local authorities stated that air quality policies were included within the Local Plan, representing a third of the local authorities examined. Of those local authorities that did not state air quality policies within their Local Plans, almost half stated categorically that there were no policies relating to air quality in their Local Plans. The remainder failed to make any reference to any such policy. Table 2 provides a small sample of specific policies relating to air quality or atmospheric pollution within local authority Local Plans, as indicated through submissions to government of air quality progress reports.

Table 2. Examples of local air quality policy within local planning frameworks.

Local authority	Local policy inclusion
Babergh Borough Council (England)	The Amended Local Plan, to be adopted in 2006 (Draft of May 2003 being used as interim planning policy) is to include a new section on air quality aimed at improving or at the very least maintaining current standards of air quality. A specific policy is as follows: <i>'the area in close proximity to the A12/A14 unsuitable for further development due to potential impact on health and to avoid further deterioration in localised air quality'</i> [14].
North Somerset Council (England)	A specific policy within Local Plan relates to 'atmospheric pollution' as follows: <i>'Local authorities are required by the Environment Act 1995 to identify areas where national air quality objectives are not met or are at risk, and designate such areas as AQMAs. An Action Plan must then be produced. In relation to planning, action could include identifying land-use matters and traffic management initiatives that would contribute towards achieving AQMA objectives. Within North Somerset, an AQMA was designated for Banwell village. There are several European Directives, which specify air quality standards, and it is essential that residential development does not take place in the few areas of North Somerset where these Directive levels are likely to be breached'</i> [15].
Aberdeenshire Council (Scotland)	Aberdeen and Aberdeenshire Structure Plan sets out broad guidance for new development in Aberdeen and the county up to the end of 2015. Policy 32 of the Structure Plan is relevant to air quality, relating to transport infrastructure and is dedicated to safeguarding land and minimising environmental impacts. <i>'Land identified in local plans will be safeguarded for transport proposals that contribute to the modern transport system. The best practicable environmental option not entailing excessive cost will be required to mitigate the impacts of transport proposals. Development proposals that result in a breach of National Air Quality Standards will not be permitted'</i> [16].

Medway Council (England)	Medway Local Plan 2003 includes a policy (BNE24) which states <i>‘Development likely to result in airborne emissions should provide a full and detailed assessment of the likely impact of these emissions. Development will not be permitted when it is considered that unacceptable effects will be imposed on the health, amenity or natural environment of the surrounding area, taking into account the cumulative effects of other proposed or existing sources of air pollution in the vicinity’</i> [17].
Arun District Council (England)	Arun District Council’s Local Plan 2003 includes a policy on air pollution (GEN34), which states: <i>‘development that contributes to air pollution through dust, smell, fumes smoke, heat, radiation, gases, steam or other forms of pollution will not be permitted unless the Council decides that the health, safety and amenity of users of the site or surrounding land is not put at risk and the quality of the environment would not be damaged or put at risk’</i> [18].

A review of transport policy indicates that early transport policy in the UK was more concerned with how to simply accommodate traffic in towns, with a report on Traffic in Towns published in 1963 [19]. Sustainable principles of managing and reducing traffic impacts were not then fully appreciated. Indication of an emerging sustainable transport policy came in 1997, with a Royal Commission on Environmental Pollution Report [20] focusing on a need to address congestion and travel behaviour [21]. The main points of the Report include:

- fuel consumption of cars must be reduced;
- permitting of heavy lorries on motorways to be introduced;
- tighter EU limits for new vehicle emissions;
- fuel prices to be raised by more than 6% per year;
- local councils should be able to charge for road use;
- improved provision of access into towns and cities for cyclists and buses, and
- greater integration of transport and land-use planning.

Following the publication of the Report, the UK government published various White Papers and introduced legislation to address key transport issues, including *A New Deal for Transport: Better for Everyone* [22], and the *Road Traffic Reduction Act 1997* [23]. The Auto-Oil programme has, over the last decade, worked to reduce emissions from vehicles, having a demonstrable impact on reducing emissions over the last decade [24]. More recently, focus has shifted towards the reduction in the number of vehicles on urban roads and reducing demand for specific road space. Proposals for local authorities to charge vehicle users for using certain roads have emerged, and central government has provided local authorities with powers to test vehicle emissions on a proactive basis [24].

To reduce vehicles emissions, specific emission control measures or traffic management measures, or indeed a combination of the two, is required. Emission control measures include ‘end of pipe’ technology (e.g. fitting particulate traps to vehicles), the use of alternative fuels (such as LPG, methane or hydrogen) or the enforcement of emissions standards (e.g. through the use of Low Emission Zones). Transport management measures involve a whole range of public transport improvement measures, parking permitting and measures to reduce overall travel time [25]. At a national and international level, telematic technology is linking urban traffic control systems with air quality management systems [26] to look at electronic charging, driver communication and other such strategies.

As introduced earlier, the mechanism for local transport policy to bring about air quality improvement is through the local transport planning process. Local action to reduce traffic

congestion and impact from traffic emissions in areas of impoverished air quality requires collaboration between Local Transport Planning departments (as highways authorities), Environmental Health departments and external agencies. Beattie *et al.* [27] report on the lack of involvement of the Highways Agency (the agency and operator of the major trunk road network, including all motorways, in England) with respect to pollution hot spots identified by local authorities. Action on the part of local transport planners is much more advanced however, with transport planners taking a lead in implementing Air Quality Action Plans in some local authorities.

With over 80 local authorities having submitted their Air Quality Action Plans to date [28] and many more being prepared, local authorities are investigating the potential effectiveness of transport measures in delivering air quality improvements. Measures being considered are road pricing initiatives and Low Emission Zones particularly within London [29], and management techniques such as High Occupancy Vehicle (HOV) lanes and vehicle prioritisation schemes [27].

Local Transport Plans, for many local authorities, will become the most effective mechanism for implementing actions to reduce air quality problems. Traffic management schemes, where priority is increased for buses, cyclists and non-car modes are local policy measures anticipated to assist with many of the pollutant hot spots. Where emissions from the motorway or trunk road network have led to localised pollution hot spots, regional and national policy, rather than local policy, is more likely to impact upon air quality. Speed controls, demand management and junction configurations all play a role in affecting the speed, composition and flow of the traffic, none of which can be influenced through local government policy implementation alone.

## **DISCUSSION**

In recent years, the urgency to manage increasing levels of car usage, dependency and miles travelled have led to numerous policy developments, nationally and locally. Transport is widely recognised as a significant and increasing source of air pollution and impact on human health [30], with the link between air quality and health underpinning the National Air Quality Strategy [31].

With respect to local land-use planning frameworks, an emergence of local policies to tackle air quality and pollution through the local planning process is underway. However, local authorities do not appear unified in their approach to air quality considerations in planning. This is illustrated in the examples provided, where development is considered by one local authority to be 'unsuitable' where air quality might, as a result of development, deteriorate or where air quality objectives or EU limit values are breached. Other local authorities are more stringent in their assessment, stating that development 'will not be permitted' in such circumstances. One local authority even states that it is 'essential' that residential development does not take place in locations where development may lead to breaches of EU Directive levels.

Variation in the approach to incorporating air quality policy within planning frameworks is leading to different interpretations of air quality impacts from development, and various approaches of addressing air quality. In recent years, a body of case law in respect of proposed development and its potential impact on local air quality has emerged [32]. Many local authorities with designated AQMAs are concerned with the potential impact of AQMAs on planning blight [33], and the potential for property blight was the main concern demonstrated during AQMA training workshops provided in various regions of the UK [34]. Planning

proposals that have tested air quality as a material consideration have included those to develop tracts of land alongside motorways for residential purposes, and a large retail development close to residential property [5, 32].

Successful Air Quality Action Plans will require the integration of various policy packages [27]. Funding schemes for action planning measures are crucial to the success of Action Plans, and most financial assistance is likely to be provided through the Local Transport Plan bidding process in the short-term. Recently, Government has suggested that Air Quality Action Plans may not be required by all local authorities with AQMAs, with those local authorities with issues relating to local traffic being incorporated into Local Transport Plans [35]. The debate continues. More certain is the need for local authorities to develop local Air Quality Strategies to ensure that all aspects of local government planning policy consider the potential impact on local air quality [3].

## CONCLUSIONS

Designated AQMAs are being seen as drivers to push through wider transport and planning initiatives, and declaring AQMAs is considered beneficial to wider council plans and policies [36]. Locations designated as AQMAs clearly provide an important starting point for identifying specific areas where planning processes should be focused on improving local air quality. What is also clear is that the focus of such planning processes are formal Local Transport Planning processes and Local Planning processes. However, if reducing vehicle emissions involves either specific emission control measures or traffic management measures (as mentioned), or more likely a combination of the two, then this requires policy integration at both the national and local level.

In the short to medium term, developments in vehicle and fuel technology are assisting with an overall reduction in total emissions. Future developments (e.g. hydrogen fuel-cell engines and other such technical fixes) will provide certain solutions. However, local policy implementation will have to be more effective to deliver solutions to address the specific pollution hot spots in the short to medium-term for delivering the air quality objectives across the UK. Cleaner, quieter vehicles may be in use, but until congestion is reduced and travel behaviour changes more radically, towns and cities will remain choked, noisy and potentially unhealthy environments for future generations to experience.

The need for integration of air quality, planning and transport planning policies at the national level is currently hindered through quite disparate government departments charged with developing and implementing environmental, planning and transport policy. As Begg and Gray suggest [6], transport and environmental policies are *living in separate houses at present, with the danger that they are heading for divorce*. At the local level, however, clear progress is being made with the integration of air quality considerations in to local planning and transport planning frameworks, albeit on a rather ad-hoc and non-unified basis. Only continued effort on the part of local government across the UK will bring about any real improvement to local air quality in the long-term. Divorce between local planning frameworks, transport planning and environmental protection must be avoided at all cost.

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