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Stephen Peckham

Assessing air-quality impacts in planning decisions in England: should we focus more on health?

While there has been an increasing recognition of the health impacts of air pollution assessment of air quality and health impacts is rarely adequately reviewed in planning decisions. Planning decisions are generally based on meeting national annual average air quality targets despite substantial evidence that levels below these are harmful to health and references to population health impacts in the UK National Planning Policy Framework and Environmental Assessment Guidance for planning. This article reviews the current framework and discusses how air quality has been taken into consideration in some recent planning decisions and legal appeals. Problems in assessing air quality in planning decisions and the increasing evidence on the long and short-term impacts of poor air quality are highlighted. The article concludes by arguing that health impacts should be more clearly addressed when considering air quality assessment setting out some potential approaches to how this could be incorporated in the planning process.

Keywords: air quality, planning, health, air quality management, local government

Introduction

Air quality has become a topic of significant concern in recent years due to increasing evidence of the detrimental public-health impact of air pollution, particularly emissions from traffic. In the UK, public and governmental concern results from legal cases concluding that the government has not been taking sufficient action to address high levels of nitrogen dioxide (NO₂) (*R(Client Earth)(3) v. SSEFRA*, 2018). Recent reports have also highlighted the significant adverse health impact of poor air quality which accounts for some 64,000 premature deaths in the UK every year and that the cost of poor health related to air pollution has been estimated at £20 billion in the UK each year (House of Commons Environment, Food and Rural Affairs Committee, 202, 60). There has been significant interest in local air-quality management practice, improving local assessment and action to reduce vehicle emissions, a principle source of urban pollution (Hayes, 2018; Longhurst et al., 2016). However, less attention has been paid to the important role of local authority planning processes which determine the pattern of housing and commercial development and subsequent air-quality implications.

The relationship between planning and health has historical roots with early planning initiatives playing a critical role in protecting people's health through improved air quality, drinking water, rubbish removal, land use and tenement housing reforms (Arthurson et al., 2016, 5). Over the years interest in utilising planning powers

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to control pollution problems has waxed and waned (Miller and Wood, 2007, 597). More recent concern about environmental issues in planning and development policies emerged in the 1970s, subsequently strengthened by increasing environmental regulation following the UK joining the European Community. While the current context is somewhat different than a century ago, planning still plays an important role (Carmichael et al., 2016). As Khreis et al. (2017, 60) argue, ‘if current urban and transport planning practices are responsible for a substantial but modifiable burden of disease, then improved practices within both fields could lead to new solutions for creating healthier and more sustainable communities.’

The link between poor air quality and health led to earlier efforts to regulate pollution such as the Clean Air Act 1956 introduced in response to the London smog of the 1950s. More recently interest has focused on NO₂ and particulate matter (PM) – especially from the use of fossil fuels and vehicle transport in particular (Longhurst et al., 2016). Public Health England (PHE) and the National Institute for Health and Care Excellence (NICE) have highlighted the health impacts of air pollution, providing evidence of both short-term roadside and longer-term exposure on the burden of disease and mortality (NICE, 2017; 2019; PHE, 2018). More importantly, the evidence of the impact of fairly low levels of pollutants on human health is widely accepted, with the World Health Organization (WHO) and others highlighting the significant adverse effects worldwide (Landrigan et al., 2018). Daily exposures to PM are associated with both mortality and morbidity at levels significantly below current UK Limits (see Figure 1), with children and older people being particularly at risk, and short-term exposure can lead to adverse physiological changes in the respiratory and cardiovascular systems and contribute to the burden of non-communicable diseases, including cancer, diabetes and possibly dementia (WHO, 2013; Landrigan et al., 2018; Williams et al., 2019). The relevance of development and transport planning to improving air quality and reducing adverse health effects is widely recognised (NICE, 2017; 2019; PHE, 2019a). The issue is of heightened interest given emerging evidence linking ambient air pollution with increased mortality from coronavirus (Ogen, 2020; Travaglio et al., 2020). The UK Department of Environment, Food and Rural Affairs (DEFRA) has called for additional research into this issue and APPGAP has called for additional government support to improve air quality as the UK moves out of lockdown with an emphasis on transport planning and improved environments (APPGAP, 2020).

In the UK, planning is a devolved function with different systems operating in England, Northern Ireland, Scotland and Wales. The discussion here focuses on England. The legal framework for air-quality (AQ) assessment is the same in England and Wales and air-quality objective limits are similar across the UK, except in Scotland where the PM_{2.5} limit is the WHO limit – lower than in the rest of the UK. Planning policy and decisions at the local-government level are guided by the National Planning

National air quality objectives and European Directive limit and target values for the protection of human health							
Pollutant	Applies	Objective	Concentration measured as ¹	Date to be achieved by (and maintained thereafter)	European Obligations	Date to be achieved by (and maintained thereafter)	
Nitrogen dioxide	UK	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200 µg/m ³ not to be exceeded more than 18 times a year	1 January 2010	
	UK	40 µg/m ³	annual mean	31 December 2005	40 µg/m ³	1 January 2010	
Ozone	UK	100 µg/m ³ not to be exceeded more than 10 times a year	8 hour mean	31 December 2005	Target of 120 µg/m ³ not to be exceeded by more than 25 times a year averaged over 3 years	31 December 2010	
Particles (PM ₁₀)	UK	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004	50 µg/m ³ not to be exceeded more than 35 times a year	1 January 2005	
	UK	40 µg/m ³	annual mean	31 December 2004	40 µg/m ³	1 January 2005	
	Indicative 2010 objectives for PM ₁₀ (from the 2000 strategy and Addendum) have been replaced by an exposure reduction approach for PM _{2.5} (except in Scotland – see below)						
	Scotland	50 µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31 December 2010	50 µg/m ³ not to be exceeded more than 35 times a year	1 January 2005	
	Scotland	18 µg/m ³	annual mean	31 December 2010	40 µg/m ³	1 January 2005	
Particles (PM _{2.5}) Exposure Reduction	UK (except Scotland)	25 µg/m ³	annual mean	2020	Target value - 25 µg/m ³	2010	
	Scotland	10 µg/m ³		31 December 2020	Limit value - 25 µg/m ³	1 January 2015	
	UK urban areas	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020	Target of 20% reduction in concentrations at urban background.	Between 2010 and 2020	

Figure 1 UK National air quality objectives

Policy Framework (NPPF) (MHCLG, 2019a). Local planning authorities (LPAs) must adequately consider air-quality impacts of development on population health. However, the NPPF is simply a guide and LPAs balance these requirements against other national policy, guidelines and local priorities. There is reference in planning guidance to policy governing air-quality management – particularly in relation to areas covered by air-quality management areas (AQMA) where NO₂ or PM exceeds national limits. However, the regulatory frameworks covering air-quality management and planning decisions are separate, with responsibilities split between different departments at both central and local government levels. Local government also has statutory powers related to the health and well-being of local residents. The Local Government Act 2000 (the ‘2000 Act’) allows principal local authorities in England and Wales to promote the economic, social and environmental well-being of their area (the ‘Well-Being Power’), which includes the promotion or improvement of the health of residents and visitors.

Planning policies and decisions should generally sustain compliance with, and contribute towards, meeting national objectives for air pollutants, with EU directive

limits currently retained even though the UK has now left the EU. Planning policies and decisions should also ensure that new developments in an AQMA are consistent with the local air-quality action plan (AQAP) and that opportunities ‘to improve air quality or mitigate impacts should be identified’ (MHCLG 2019a, para. 181). Air-quality (AQ) assessment is a key part of the impact assessment for local plans and major planning applications. In some countries (e.g. the Netherlands, the USA and New Zealand), a more formal health impact assessment (HIA) is often required (Fischer et al., 2010). An HIA is rarely requested by UK LPAs although the Welsh government has more actively promoted their use. However, even where these are undertaken there is little evidence of their impact (Chadderton et al., 2013; Den Broeder et al., 2017).

Recent changes in guidance for environmental impact assessment (EIA) have placed more significance on the responsibility of developers to assess direct and indirect effects on ‘population and human health’, including the risk from poor air quality (MHCLG, 2017). The significance has been heightened by increasing evidence of the health problems associated air pollution, particularly road transport (Barnes et al., 2019). EIAs should also detail monitoring, enforcement and mitigation to ensure that development impacts outlined in the EIA are fulfilled (MHCLG, 2017). National guidelines and policy on air quality are the responsibility of DEFRA, while planning and the application of environmental assessment are the responsibility of the MHCLG. Sub-nationally, local government has responsibility for air-quality measurement and is the planning decision-making authority. This division of responsibility creates a weakness in ensuring that air-quality objectives are met (Barnes et al., 2018).

This aim of this article is to explore the degree to which air quality, and its health impact, are considered by LPAs during the decision process. It provides an overview of current guidance and legal frameworks governing AQ assessment and how the impact of air quality is considered in local planning processes. The article then discusses a number of examples where air quality has emerged as a key issue. The cases referred to are used primarily as illustrative examples and have been selected either due to personal involvement in the cases, or identified in environmental and air-quality news alerts (such as ENDS Reports) and reference to planning appeal decisions. The author was directly involved as expert witness in two cases referred to – *Gladman v. SSHCLG & CPRE* (2017) and *R(Shirley) v. SSHCLG* (2019), and also supported local groups in some of the other planning cases discussed here. The article only highlights aspects related to AQ assessment to illustrate how air quality, and public-health impacts, are considered in the planning process, drawing on evidence from AQ assessment, and planning officers’ and planning inspectors’ reports. The article concludes by exploring the implications for future planning decisions and whether current EIA and AQ assessment frameworks provide adequate guidance and power to LPAs on AQ assessment and health impacts.

Air-quality management and the current legal framework

In the UK, action to manage and improve air quality has been largely underpinned by the EU 2008 Ambient Air Quality Directive that sets limits for concentrations in outdoor air pollutants that impact public health such as PM_{10} and $PM_{2.5}$, NO_2 and low-level ozone (O_3). These were incorporated into the Environment Act 1995 and subsequent amendments that require local authorities to review the air quality within its area (Section 82) and to designate an AQMA where air-quality objectives (see Figure 1) are not being, or may not be, achieved (Section 83). Responsibility for meeting the directive is a national government one, as highlighted in *R(ClientEarth(3)) v. SSEFRA* (2018). *The future compliance framework now the UK has left the EU is not yet clear*. Currently, proposals in the Environment Bill retain EU directive levels, but no new targets have been set despite indications in the Clean Air Strategy (DEFRA, 2019a). However, the Secretary of State will be required to set air-quality targets with a specific requirement for $PM_{2.5}$ (Environment Bill, Part 1, Chapter 1).

AQMAs have a specific relevance in planning guidance as LPAs must consider whether local plans and developments will have a negative impact on these areas. Once an AQMA has been designated, a local authority is required to develop an AQAP detailing remedial measures to be implemented where national objectives are not met, or are at risk of not being met. Producing an AQAP is currently the only legally required commitment; local authorities are not required to demonstrate that they have achieved, or will achieve, compliance with national limits. Currently it is unclear whether local authorities can be held responsible for failing to meet the target limits set out in the EU directive as it is solely the duty of the Secretary of State to ensure compliance (Barnes et al., 2018).

Local authorities with declared AQMAs are required to submit annual status reports (ASRs) to DEFRA detailing local monitoring and actions being taken to achieve compliance with national objectives. These are assessed for content compliance by DEFRA, which may give feedback to local authorities, but only 'to give local authority further guidance on the content of their Action Plan' not on the effectiveness or achievability of the plan (DEFRA, 2019b). Until 2018, DEFRA had not required any local authority to amend their plans, with recent directions to 38 cities only arising as a result of legal action challenging the government's air-quality action plan (*R(ClientEarth(3)) v. SSEFRA*, 2018). Problems associated with this process have been extensively discussed elsewhere (Barnes et al., 2018). This is despite the fact that there are currently over 600 AQMAs in place across hundreds of local authorities where NO_2 or PM_{10} values exceed national limits (DEFRA, 2020). This also underrepresents the actual number of places where air-quality limits are exceeded as monitoring only takes place where local authorities determine there is a need, not everywhere where there are exceedances (Marsh, 2017). The location of monitoring has important implications for AQ assessment in planning decisions, as will be illustrated later in

this article. Under current legislation the remedy at a local-government level remains simply to have an AQAP in place, rather than a duty to ensure that limit values are not exceeded. The government's Clean Air Strategy (DEFRA, 2019a) proposed that the duty to meet limit values would be strengthened but this has, like promised new PM_{2.5} limits, not been included in the Environment Bill.

Planning policy framework for AQ assessments

LPAs in the UK (district, unitary and county councils) are responsible for strategic planning policy through local development plans, which are primarily spatial allocation plans but also set out core planning policies, and planning decisions on individual development proposals. The actual process and responsibilities vary between the different constituent countries of the UK and the focus here is more specifically related to England. Environmental assessments and assessing air quality are relevant to both areas of responsibility but governed by separate guidance and with differing emphases.

For local development plans, LPAs have been required since 2001 to undertake a sustainability assessment which incorporates a strategic environmental assessment (SEA), including assessing the impact on health (MHCLG, 2019b). In contrast, a health assessment was not required in the EIA until 2017. However, while the inclusion of health in both the SEA and the EIA has been widely welcomed by public-health professionals, in practice it is not clear how involved they have been in local plan making or in major development assessments (TCPA, 2019).

In the UK, LPAs determine most development applications. Appeals and national strategic developments are determined by the Secretary of State for Housing, Communities and Local Government (SSHCLG). Air-quality planning guidance requires LPAs to achieve a balance between economic, social and environmental considerations, including considering the potential impact of new development on air quality (MHCLG, 2019c). Particular attention must be paid to complying with national air-quality objectives and EU directives, local AQAPs and strategies, any degradation (or improvement) in local air quality and whether the development will introduce new public exposure into an area of existing poor air quality.

Air quality is a material consideration in planning decisions and must be given due weight when determining an application as set out in the NPPF and the EIA regulations (MHCLG, 2017; 2019b). Only larger residential and commercial developments are likely to impact air quality due to increased emissions created by the developments. In such cases an AQ assessment is normally required as part of the EIA (MHCLG, 2017). The main source of pollution is usually vehicle emissions due to increased traffic levels (NO₂ and PM). Planning regulations set out the specific circumstances about what types of development require an EIA, but leave the detail of what is included rather vague, and LPAs determine when an EIA is required and

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

Figure 2 Institute of Air Quality Management Impact descriptors for individual receptors (IAQM, 2017, table 6.3)

what should be included. Most assessments refer to guidance from the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) (2017), which provides threshold criteria for establishing when significant impacts on local air quality may occur and when a detailed assessment of potential impacts is required.

Failure to include appropriate information on air quality could result in an invalid application or in the application being refused or delayed (Arabadjieva, 2017). LPAs need to identify, describe and assess in an appropriate manner the direct and indirect significant effects of the proposed development on population and human health (4(a)). MHCLG publishes planning guidance on air quality, although the provisions are quite general (MHCLG, 2019c, para. 005, reference ID 32-005-2019). How air quality is assessed within EIAs varies. Most assessments utilise DEFRA modelling tools and IAQM and/or local planning guidance to calculate levels of pollutants – especially in the absence of local air-quality monitoring – as well as calculating the potential impact of development on air quality at a future date.

With growing concerns about air quality in the UK, the latest revision to the NPPF (MHCLG, 2019a) has both directly and indirectly placed greater emphasis on considering air quality and its impact on population health. Previously the NPPF simply required compliance with national air-quality objectives, impacts on AQMAs and compliance with AQAPs. As Barnes et al. (2018, 36) noted, ‘air quality considerations rarely carry sufficient weight in development control decisions, even where developments are expected to lead to a worsening of public health’.

The reasons for this included a presumption of development within the NPPF explicitly stating that the presence of an AQMA should not necessarily preclude development and government policy that has prioritised house building and other development. This invariably meant that protection of public health was seen to be in opposition to national priorities for growth and ambitions for economic development. (Barnes et al., 2018, 36)

The current NPPF (MHCLG, 2019a) places more emphasis on air-quality impacts so that as well as taking account of AQMAs and, where existing, clean air zones (para. 181), LPAs should seek ‘to improve air quality or mitigate impacts’ (para. 181). It also links air quality issues to vehicle emissions, with authorities having to ensure that ‘environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for providing mitigation’ (para. 202(d)). The NPPF also encourages development in locations that are or can be made sustainable to help to reduce congestion and emissions and improve air quality and public health (para. 103).

However, planning law is complex and the NPPF lacks any formal legal status. For example, in a case that was eventually heard in the Supreme Court (*Suffolk Coastal DC v. Hopkins Homes*, 2017), the ruling stressed that the NPPF is no more than guidance and cannot ‘displace the primacy’ of a statutory development plan. The NPPF is clear that planning decisions will involve a balanced decision between different negative and positive outcomes. There is significant emphasis on meeting housing-supply targets, and supporting economic development or meeting housing-allocation targets tends to carry more weight than consideration of issues such as air quality (e.g. Lambeth Borough Council, 2019).

In fact the NPPF explicitly refers to three equally important, interdependent, overarching objectives to achieve net economic, social and environmental gains (MHCLG, 2019a, para.8). However, environmental and health impacts are given less priority, with the NPPF emphasising that ‘[s]ignificant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development’ (MHCLG, 2019a, para. 80).

The NPPF provisions are supported by several guidance documents. EIA guidelines in England reflect the increasing relevance of ensuring that development minimises human health impacts. DEFRA provides a number of modelling tools

for calculating emissions and damage cost estimates to air-quality impacts. However, application of these models relies on the availability of air-quality data, which are not always available, leading to potentially different interpretations of air-quality impacts (Mills and Peckham, 2019). There is also a range of professional-body guidance from the Royal Institute of Town Planning, IAQM and EPUK. There is also guidance to promote active transport and modal shift, sustainability and support for reducing diesel vehicles and promoting electric cars, taxis and buses (NICE, 2017; 2019; PHE, 2019a). Locally, areas that have particular air-quality problems, such as those with declared AQMAs or low-emission zones, are developing stricter guidelines drawing on this wider policy and guidance.

Currently, general planning and air-quality management frameworks guiding local authority planning decisions lack clarity and do not provide sufficient guidance to LPAs about how they should assess the negative impacts of air quality arising from developments in relation to health. Guidance focuses on whether developments comply with national air-quality objectives, with little attention to health. LPAs can refuse permission, grant with conditions that may include mitigation to reduce detrimental air-quality effects (including an economic cost calculation and various actions aimed at reducing emissions), or require further monitoring, but without clear criteria about how, if at all, these should be determined and applied.

Application of air-quality issues in recent planning decisions

The following examples discuss illustrative cases where air quality has been a significant planning issue. They provide examples of how air quality is considered in planning decisions and what weight and conditions are applied in practice. In particular, they highlight how decisions regarding air quality rest on assessment against national air-quality objectives for NO_2 , and $\text{PM}_{2.5}$ and PM_{10} as determined at specific locations, and overall damage cost mitigation calculations, and ignore the wider evidence on health impacts on populations.

Local objections to a housing scheme in Hassocks, West Sussex, included concerns expressed about a negative impact on air quality, leading to permission being refused. An appeal was initially dismissed by a planning inspector in 2015 following a successful argument by those opposing that the development that it would have a detrimental effect on a nearby AQMA as the AQ assessment did not take into account uncertainty about the future impact of emissions from diesel vehicles. This was at the time of the VW scandal involving questions about whether actual on-road emissions really conformed to Euro 6 guidance. On appeal to the High Court the inspector's decision was quashed due to an error by the inspector for accepting this evidence despite having accepted that it was not grounded in fact. The developer resubmitted the application with a revised AQ assessment that demonstrated that NO_2 would

stay within national limits. On the basis of this assessment the planning inspector concluded that the proposal did not breach local or national air-quality policies, arguing that ‘the proposal would not impede the improvement in air quality within the AQMA sought by the action plan in this case having regard to the contribution by way of planning obligation to be made towards implementing its measures’ (APP/D3830/W/14/2226987 2017, para. 25). The inspector noted that the council had already agreed that developer’s approach to assessment was appropriate and that, as such, the air-quality impact of the scheme would have an insignificant effect on health. This demonstrates how national limits are used as a proxy for assessing health impact. This is a routine approach in AQ assessment for planning decisions, as will be demonstrated in the following further examples.

In Uttlesford, Essex, the health impact of air quality was explicitly referred to as a reason for refusal because the proposal ‘by reason of its size and scale would give rise to unacceptable levels of air quality within Newport which can have a harmful impact on human health’ (UDC Decision notice, 17 May 2017). The developer appealed and submitted a revised AQ assessment that demonstrated that the development would comply with national AQ objectives. The revised AQ assessment made explicit reference to council policies regarding development not *leading to significant adverse effects on health* (Air Quality Consultants, 2019, 9). The assessment also referred to the fact that the government has established air-quality standards and objectives to protect human health set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. The AQ assessment is interesting as it explicitly refers to IAQM guidance. That guidance recommends that the assessment of significance should be based on professional judgement, and that

the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals ... A judgement of the significance should be made by a competent professional who is suitably qualified. (Air Quality Consultants, 2019, 90)

But judgement about the significance is rarely, if ever, made by a health professional. Normally judgement is made by the air-quality consultants and planning officers. In this case the planning inspector judged that the proposal wouldn’t give rise to unacceptable levels of air quality that would harm human health (Appeal Decision APP/C1570/W/18/3209655, para. 79). These cases appear to have placed greater weight on the national annual objectives, not on whether additional emissions would be harmful to population health. This is particularly explicit in an AQ assessment for another proposed development which made extensive references to the impact on

human health and where the final environment statement refers to ‘health-based air quality objectives’ (Savills, 2019, para. 6.8.4). Again, even though reference is made to human health there is no reference to any health professional or to recent evidence on the impacts of air pollution on health.

Yet even when potential health impacts are recognised, these tend not to be considered critical. For example, in 2019 Lewisham Council in London granted permission for a block of 56 flats within an AQMA despite an adverse AQ assessment and in a location with an annual average concentration of $56.3 \mu\text{g}/\text{m}^3$ of NO_2 – substantially higher than the national limit of $40 \mu\text{g}/\text{m}^3$. The developer’s AQ assessment made a number of references to national and Greater London Authority (GLA) policies regarding the impact of AQ on health but primarily in relation to ensuring reductions/mitigation for construction and demolition, but not on occupation (Arden, 2018). Arden’s AQ assessment (para. 7.10) does recommend measures to reduce residents’ exposure to traffic pollution by keeping windows closed. The planning officer described air quality as ‘a low priority’ but that a planning condition be applied to ensure that residents of the lower three floors were provided with information about the potential air-pollution risks to human health (Lewisham Borough Council, 2019). In contrast to the little consideration given to air quality, the officer’s report placed significant weight to the development contributing 56 homes to Lewisham’s housing target of 1,131 dwellings. While the GLA refused, it was not on AQ or health grounds, despite the fact that the London Plan Policy 7.14 emphasised ‘*the importance of tackling air pollution and improving air quality to London’s development and the health and well-being of its people*’ (GLA, 2016).

In another recent example, the LPA granted permission for a major development, ‘Anglia Square’, in Norwich, despite the fact that the impact on air quality in the AQMA would be negative, meaning that the AQMA would continue to breach national air quality limits. This was despite a public-health report which, while not placing significant objections, was concerned that

modelling of both current use and post-development use of the site indicates a number of locations which would fail to meet existing, never mind reduce current levels of, air quality standards in terms of NO_2 and also fall above current recommended WHO measures for PM_{10} . In some cases the modelling suggests NO_2 levels may exceed hourly as well as annual mean figures. These hourly exceedances represent potential risks to people who may work or shop in the area as well as pedestrians, cyclists and drivers. (Norfolk County Council Public Health, 2018)

The planning officer’s report referred to the public-health officer’s concerns and that it was accepted that pollution levels would remain above national limits in the vicinity of the development, including hourly exceedances. However, as the council’s environment health officer was satisfied that pollutant concentrations in proposed

public amenity areas in the development would not exceed relevant statutory targets approval was recommended (Norwich City Council Planning Officer Report, 2018, para. 522).

The application was ‘called in’ by the Secretary of State for MHCLG and a planning inquiry was held in early 2020. The proposal is opposed by a number of local groups with air quality one of the major areas of concern. The AQ assessment for the developer undertaken by Aether Ltd referred explicitly to the potential adverse health effects of NO₂ and PM₁₀ and refers to the health evidence by the Committee on the Medical Effects of Air Pollutants (Aether Ltd, 2018, 9). However, this is the only reference in the assessment to health, as the rest only refers to national air-quality limits. These examples suggest that there is a disconnect between acknowledging that there are significant health impacts from poor air quality and the lack of discussion or review of relevant health evidence. The approach appears to be standard and widespread, with the same wording repeated in a later assessment (Aether Ltd, 2019), although in this latter case in Redbridge (London), there is some additional attention paid to the impact of construction dust. Interestingly, AQ assessment in neither Lewisham or Norwich included an analysis of impacts of PM_{2.5} despite this pollutant having significant adverse health effects.

Problems of measurement of air-quality impacts and how these are viewed in the planning process are well illustrated by an appeal case in Kent. Here a developer appealed against non-decision and subsequent refusal for a development that did not conform to the local development plan. One of the grounds for refusal was on air quality. The AQ assessment submitted with the development (Wises Lane) argued that the development of 675 houses, a school and rugby pitches on a green-field site bordering Sittingbourne would have a positive impact on air quality despite the development contributing an additional 1.5 million additional vehicle movements and some 2.5 tonnes of NO₂ and PM_{2.5} each year (Entran Ltd, 2017). The argument was based on building a new road through the proposed development, removing some traffic from an existing congested A road. The case raises the issue of whether simply redistributing pollution so that no selected receptor locations breached national objective limits means that the air-quality impact is beneficial even if the site generates additional levels of pollution. Mitigation proposals relied heavily on including EV points, landscaping and highway improvements, and a travel plan was subsequently shown as having minimal impact on reducing pollution levels over a five-year period (Entran Ltd, 2017). There was no existing local pollution monitoring, so all assessments were based on modelling of traffic and emissions, which, the developer claimed, redistributed pollution from an area that potentially exceeds national limits to an area with low pollution levels – ironically because it was currently a greenfield site. This case also demonstrates how AQ assessments simply equate national limits with setting health safety limits:

The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence ... These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects. (Entran, 2017, para. 8.52)

Even putting to one side the wealth of evidence that clearly shows that the standards are not protective of health, Entran also referred to lower WHO limits – which are lower than UK limits for PM. Yet the assessment then completely ignores these even though their modelling shows that levels of PM will exceed them – and therefore, presumably, be damaging to human health.

Interestingly in this case, local monitoring by opponents led to additional subsequent local authority monitoring identifying an area that exceeded national objective limits for NO₂. Had this previously been identified and registered as an AQMA under current planning guidelines it would have had more significance in the determination of the application. Also of interest is that if only the national objective limits are considered as relevant this would give preference to schemes in green areas where current background pollution levels are low, compared to urban areas where there may already be locations near to or above national limits. The final decision is awaiting the outcome of a planning inspector inquiry (Ref APP/V2255/W/19/3233606).

Until 2019, developers were only required to provide mitigation outlined in DEFRA and local guidance funded through damage costs calculated using DEFRA guidance (Birchby et al., 2019). Generally, mitigation has included measures to promote modal shift and the provision of EV points and of green space/landscaping. Until recently, there was no requirement for developers to demonstrate that mitigation would actually reduce the level of emissions. However, in November 2019 MHCLG guidance changed as the result of an Appeal Court ruling in *Gladman v. SSHCLG* (2019), upholding an inspector's decision regarding AQ assessment. In 2017, Gladman Developments Ltd appealed the refusal of planning permission. The inspector dismissed the appeal on a number of grounds, including the impact on air quality, following representation from the Kent Campaign to Protect Rural England (CPRE). The CPRE argued that the development would contribute to continued breaches of the national limits in an AQMA and that the developer had not provided adequate mitigation that clearly demonstrated that it would reduce pollution levels resulting from the development. The developer appealed to the High Court (*Gladman v. SSHCLG*, 2017), which upheld the inspector's decision arguing that the developer could not rely on the assumption that the UK would comply with its directive obligations by 2020 (which it has not). The developer appealed but in dismissing the appeal the judges' ruling made clear that any mitigation proposed by a developer must demonstrate that it will have the effect of reducing pollution arising from the development (*Gladman v. SSHCLG*, 2019). As a result it is now not sufficient to make general statements about mitigation – it 'must be real' and demonstrable in terms

of the impact on pollution levels. Neither can developers rely on this being the responsibility of other bodies, such as DEFRA or local authorities. As a result of the ruling planning guidance on air quality was updated by MHCLG in November 2019 so that mitigation options ‘will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact’, and so that mitigation is appropriate ‘to ensure new development is appropriate for its location and unacceptable risks are prevented’ (MHCLG, 2019c). Interestingly, the power to ensure that mitigation is an outcome rather than just a means has always been available to LPAs in determining applications, and compliance can be a planning condition, but in the cases reviewed above, actual achievement of reductions was not made a planning condition. Generally planning decisions focus on whether national air-quality limits are breached and mitigation is accepted if it complies with cost calculations and mitigation guidance (Birchby et al., 2019; MHCLG, 2019c). Generally, AQ assessments do not address any evidence on health impacts and some do not include PM_{2.5} in their assessments.

In another case the a judicial review (JR) was brought against the SSHCLG for not exercising his discretion to call in a planning decision where the development would lead to adverse impacts on an AQMA as it was contrary to the NPPF because it did not ‘contribute to conserving and enhancing the natural environment and reducing pollution’ (MHCLG, 2012, 17). In *R(Shirley) v. SSHCLG* (2019), the court was asked to consider the extent to which the SSHCLG was obliged to act in order to give effect to the Air Quality Directive in relation to planning permission for a major development of 4,000 houses and associated commercial and other developments in Canterbury, Kent. The planning officer’s report to the planning committee concluded that the developer’s proposed mitigation measures and a monitoring regime made the development acceptable (Canterbury City Council, 2016). Campaigners argued that the assessment did not adequately address the impact on the local AQMA or provide adequate mitigation (note that this was prior to the Gladman case). The Secretary of State decided not to exercise his powers of call-in as he was content that this application was one that should be determined at local authority level. A JR was sought to determine whether simply having a local authority AQAP was a sufficient response to breaches of limit values and should the SSHCLG as the ‘competent authority’ use his call-in powers to address breaches of the air-quality limits given the legal responsibility of central government to meet EU directives.

The court upheld the SSHCLG’s decision, rejecting the appeal, a ruling subsequently upheld by the Court of Appeal in 2019. The ruling confirms that the ‘specific and bespoke remedy’ when it comes to breaches of the directive is the implementation of an AQAP by the local authority even if there could be breaches of the national objective targets. The court acknowledged that possible breaches of limit values may be relevant to planning decisions but that their potency as material considerations was not such that the decision maker was obliged to refuse planning permission, nor did

it require the SSHCLG to assume the decision-making responsibility. Basically, the ruling means that while central government may have legal responsibility for meeting air-quality limits it is not the responsibility of the SSHCLG. This appears to create a clear distinction between planning responsibilities and those of DEFRA in relation to air-quality management.

Discussion

Two key points stand out from the previous discussion. The first is that there is a general acceptance that current air-quality standards are protective of human health. Thus, as long as levels are below the standards, there will be no health effects and consequently the requirement to ensure no harmful health effect will be met. This is clearly contrary to the significant amount of evidence that shows that human health is adversely affected at levels of pollution well below national limits. The second point is that air-quality issues rarely carry any significant weight in planning decisions even when national limits are exceeded. Despite emissions improvements and the gradual shift towards hybrid and electric vehicles, it is likely that traffic will remain the major contributor of NO₂ and PM for the next decade or more, especially given concerns that electric cars contribute to substantial levels of PM_{2.5} (Timmers and Achten, 2016). Calls such as that from environmental groups and the APPGAP on maintaining clean air following dramatic reductions in pollution and associated health impacts during the COVID-19 lockdown in 2020 add further emphasis on ensuring we establish new regulatory frameworks and approaches to reduce air pollution (House of Commons Environment, Food and Rural Affairs Committee, 2020).

The problem is that current UK and EU national objective limits for key pollutants are substantially higher than levels appropriate for the protection of health. The WHO has lower maximum limits for PM, which were suggested as an objective in the Clean Air Strategy (DEFRA, 2019a), and already adopted in Scotland. This is not included in the Environment Bill and there is increasing evidence that even these limits are not protective of health (WHO, 2013). PHE and NICE guidance highlights the health impacts of air pollution with compelling evidence of a significant impact from both short-term roadside and longer-term exposure on the burden of disease and mortality and its significant health and social-care costs (NICE, 2017; 2019; PHE, 2014; 2018). Significant associations with hospital admissions for a variety of respiratory and cardiovascular diseases (including ischaemic heart disease, cerebrovascular disease and heart failure) have been found with levels of PM below WHO limits and therefore significantly below current UK limits (WHO, 2013). In particular, consideration needs to be given to the impact on more vulnerable groups such as children, older people and people with respiratory diseases, especially in areas of social disadvantage which tend to be more adversely affected by poor air quality (Mueller et

al., 2018, Williams et al., 2019). Children experience stunted lung development from annual levels of NO₂ of 10µg/m³ (25 per cent of the national objective limit); more children suffer asthma episodes on high-pollution days compared to low pollution days; and living within 50 metres of a major road can increase your risk of developing lung cancer by up to 10 per cent (Williams et al., 2019). Recent evidence from the lockdown during the COVID-19 crisis shows how the significant drops in NO₂ across many European countries led to reductions in asthma admissions, with one UK study reporting significant drops of over 70 per cent in children (Krivec et al., 2020). While such evidence supports the need to reduce air pollution to improve health, making objective assessments of the detrimental health impacts from increased air quality for planning purposes would be difficult. Using the national objective limits does at least provide a standard framework, but the current situation is inadequate and clearly places many people at risk. Incorporating health impacts into local AQ assessments is complex but if we are to minimise health impacts and significant health and social-care costs, new assessment standards are needed. This raises important questions about how the objective limits are set, who has responsibility for ensuring such limits are met and how health impacts of air quality should be assessed.

For the immediate future, LPAs will need to continue to require air-quality assessments where developments are likely to lead to increases in air pollution – particularly from vehicle emissions. The current focus on the impact on AQMAs and the annualised average objective limits means that health impacts are not adequately considered. While the IAQM guidance shown in Figure 2 provides a framework for assessing the level of impact of changes in air quality, it is not linked to the health impacts of specific pollutants (IAQM, 2017, para. 2.6).

In the UK, air-quality monitoring is limited and tends to be confined to mainly urban pollution ‘hot spots’ affected by substantial traffic emissions or other major pollutant sources. As a result, declared AQMAs under-represent the total number of areas where air quality breaches national limits – the Wisers Lane development referred to earlier being a good example (Malley et al., 2018; Marsh, 2017). Much development, especially on urban fringes or in rural areas, will not have local air-quality monitoring. Without actual monitoring, reliance on extrapolated levels of pollutants based on complex modelling may mean that decisions are based on inaccurate data, especially from diffusion tubes and/or annualised data (Malley et al., 2018; Mills and Peckham, 2019). The lack of local short-term exposure data is a particular problem given the evidence on adverse health impacts from short-term exposure to NO₂, O₃ and PM (WHO, 2013; Liu et al., 2019).

As demonstrated in *R(Shirley) v. SSHCLG* (2019), the differing legislative frameworks for planning and air quality and different legal responsibilities for central and local government result in significant weaknesses for the protection of public health. While central government is required to ensure that national objective limits are met, it has essentially

placed responsibility on local government to monitor air quality and propose actions to reduce excessive air pollution. While they have to declare AQMAs where relevant, the only remedy is still only to have an action plan – not to demonstrate reductions to meet national objectives. They are also only required to monitor and address national objectives for NO₂ and PM₁₀. In planning decisions, it is these objectives that have most significance and even these do not necessarily provide grounds for planning refusal. Furthermore, if decisions are then challenged, there is no responsibility for the SSHCLG to take responsibility as the representative of the government to ensure compliance. Also, while there are national objective limits for O₃ and PM_{2.5} there is currently no legal requirement for local authorities to monitor these, take any required actions or consider these in planning decisions, despite their significant adverse health impacts.

While EIAs cover environmental as well as health issues, the regulatory framework is weak in terms of protecting public health and inclusion of an HIA is rare. An exception is in Bristol, which has a development management policy requiring an HIA for developments likely to have a significant impact on health and well-being (Carmichael et al., 2016). LPAs and developers focus on whether estimated air-pollution impacts simply meet national UK air-quality limits. Rarely is there a reference to health impacts in AQ assessments and, where there are, contrary to the evidence it is assumed that achieving national limits means that there is no health impact.

Guidance published by the Town and Country Planning Association (TCPA, 2015) highlights air quality as one area where public-health services and professionals should influence planning decisions. Interestingly, apart from the Norwich example, in all the cases highlighted above there was no involvement of public health. In fact LPAs rarely work with public-health professionals or even environmental-health colleagues (TCPA, 2019).

Legal cases such as *R(ClientEarth(3)) v. SSEFRA* (2018), where the court heavily criticised the English 2015 Air Quality Plan for making overly optimistic projections of future compliance with limit values, and the ruling in *Gladman v. SSHCLG* (2019), appear to give weight to a legal test to ensure that measures chosen to tackle air pollution must make compliance not just possible, but likely. However, LPAs tend to give less weight to air-quality issues or accept that modelling indicating that future levels fall within annual directive objectives provides sufficient health protection. Consideration of the evidence on health impacts is simply ignored or not considered relevant and rarely explicitly referred to. While the application of evidence of health impacts is complex there are some approaches that may provide a framework for placing greater consideration on health impacts in AQ assessments. With poor air quality identified as a major contributor to morbidity and mortality worldwide – accounting for some 6.5 million deaths each year and expected to increase by 50 per cent by 2050 – developing clearer health-related assessments for adverse air-quality impact on human health is clearly of international importance (Landrigan et al., 2018).

There are two potential approaches which appear to be viable. The first is to follow the logic of the *Gladman* ruling and the London Plan to ensure that developments are air-quality-neutral. As such, mitigation proposals should be shown to negate all potential increases in pollution that would be generated by the development. This would require some agreement about monitoring and modelling. Large developments where AQ assessments are required should undertake pre-application monitoring at agreed locations that provide hourly and daily levels – not just monthly averages. There should also be a planning condition applied that requires additional mitigation contributions if air quality deteriorates post-development.

The second approach would be to apply a public-health cost consideration based on the recently published report by PHE (2019b). This provides a way of calculating the economic burden of pollution in $1 \mu\text{g}/\text{m}^3$ increments per 100,000 population, providing some estimate of impact. In addition, PHE modelling also provides estimates of early mortality for adults by area, and a report from King's College London provides a comprehensive assessment of localised impacts (PHE, 2014; Williams et al., 2019). This could be used to inform a stricter 'pathways approach' to determining the potential health impacts of air quality from new developments. This provides a way of quantifying the significance of pollutant levels for planning decisions compared with using the annual national average objective limits. Such an approach could be set out in the local development plan, which has a five-year review cycle, allowing revisions of the assessment criteria based on current health assessments incorporated into the SEA.

Conclusion

When assessing air-quality implications of development, LPAs should adopt the most rigorous and up-to-date emissions factors and dispersion models to estimate future compliance scenarios and conservative estimates and, where feasible, always insist on pre-development real-time monitoring. With the development of cheap, accurate air-quality monitors, such measurement is becoming a reality. This needs to be linked to a more realistic assessment of the potential health impacts based on emerging evidence. In relation to mitigation and minimising health impacts, a more stringent pathway to an impact-mitigation model based on current health research would be valuable and feasible. Current guidelines on assessing air quality, which focus on long-term effects, are simply inadequate to protect human health. To meet their duties to protect and promote human health LPAs need improved assessment of the health impacts, and health and social-care costs, of any deterioration in air quality due to development. Using local development plans to set clear impact criteria would be helpful here. Ultimately new government objective limits for air pollutants may be developed – particularly as the governance of air quality shifts from the EU to the

UK – but we lack details of this and to date proposals by the government in draft legislation have not included new lower limits.

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