

# NOISE, SOUND AND ACOUSTICS

## AN OVERVIEW AND CURRENT POLICY CHALLENGES



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**Acoustics affects each of us every day of our lives. Primarily this is through speaking and listening, but it is also through the acoustic properties of any room we are in and what we can hear when we are outside.**

For those under the age of about 40, acoustics was probably responsible for the first time you were seen by your family when the ultrasound image of you in your mother's womb was captured. Acoustics affects the design of concert halls and other music venues; the design of microphones and loudspeakers and the management of the sound that affects our marine life.

### ACOUSTICS IN POLICY MAKING

But for those responsible for policy development and decision making, it is acoustics in the form of the management of noise that is the most relevant.

Noise is unwanted sound or sound that causes a perceived or unperceived<sup>1</sup> adverse effect on those experiencing it. This makes noise different from air pollution. Virtually none of us can comment on the level of pollution we experience at any one moment, but we all have a view about the sound environment we are in. Furthermore, our views of that sound environment will not be the same, reinforcing the adage that "One person's music is another person's noise".

### WHAT IS THE IMPACT OF NOISE?

At the time of completing this

article, the nation is under lockdown whilst we are tackling the COVID-19 pandemic. One of the consequences has been the stark change in our sound environment with people commenting on the absence of transportation noise and, instead, being able to hear natural sounds such as birdsong more clearly<sup>2</sup>. Having said that, whilst the outside noise impact might have reduced, there is emerging evidence that confining people to their homes is increasing the number of noise complaints about noise from neighbours<sup>3</sup>.

Prior to the lockdown, the following statistics describe the current degree of noise impact:

- Noise is the second worst environmental cause of ill health in Europe (after air pollution)<sup>4</sup>.
- 100,000 health life years are lost annually in the UK due to transportation noise<sup>5</sup>;
- There are 1,000 premature deaths per annum in the UK due to transportation noise<sup>6</sup>;
- The social cost of transportation noise in England is estimated to be £7bn to £10bn per annum<sup>7</sup>;
- 11% of the population are extremely bothered, annoyed or disturbed by neighbour noise<sup>8</sup>;

- There are typically 350,000 noise complaints made every year to local authorities in England<sup>9</sup>
- 48% of the population feel their home life is spoilt to some extent by noise<sup>10</sup>

That is why it is essential that noise is effectively managed.

### WHAT FACTORS AFFECT OUR RESPONSE TO NOISE?

Consider the loudest sound you have experienced. It could be from being close to a jet aircraft, or close to gunfire, or fireworks, or being close to the loudspeaker system in a night club. But now consider the most annoying noise you have experienced. It is probably none of those listed above, but instead something like a neighbour's burglar alarm sounding, or the bass beat coming into your property from a nearby entertainment venue, or children playing or your partner snoring, keeping you awake at night. The level of sound from any of these is not as high as those that formed the group of loudest sounds.

Consequently, being annoyed by noise is not just the consequence of its level. There are many other factors as well, as set out in Box 1.

### Factors affecting whether a noise is annoying

- Character
- Frequency content (high pitched, low pitched or tonal)
- Whether it is continuous, intermittent or impulsive;
- Duration
- Time of day it occurs
- Day of week it occurs
- Relationship of the receiver to the source (if industrial or commercial, they may work there)
- What the receiver is trying to do when the noise occurs

This means it is challenging to manage noise effectively.

### MANAGEMENT OF NOISE IN THE UK

Noise is a devolved matter with each administration having slightly different policies.

- In England, the overarching policy on the management of noise is set out in the Noise Policy Statement for England (<https://www.gov.uk/government/publications/noise-policy-statement-forengland>).<sup>11</sup>
- In Northern Ireland, the overarching policy is set out in the Noise Policy Statement for Northern Ireland (<https://www.daerani.gov.uk/sites/default/files/publications/doe/noise-policy-statement-ni.PDF>)
- In Scotland, noise policy is set out in Planning Advice Note (PAN) 1/2011 <https://www.gov.scot/publications/planning-advice-note-1-2011-planningnoise/> and
- In Wales -noise policy is found in Planning Policy Wales <https://gov.wales/sites/default/files/publications/2019-02/planning-policywales-edition-10.pdf>

### THE NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The NPSE is ten years old this year and comprises two pages of policy and 4 pages of explanatory notes. Although it first came out under the Labour administration in 2010, it has been adopted by all subsequent Governments and this policy continuity is enormously helpful for practitioners.

It contains an overall vision and three aims as shown in these boxes:

#### Noise Policy Statement for England

##### Overall Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

#### Noise Policy Statement for England

##### Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

At the time of its publication, it was stated that one of the purposes was to make explicit what was implicit in existing policy and legislation concerning noise management. Thus, much of the policy in the NPSE already existed. It was, instead described

in a way that could apply to any situation. Arguably, the only new policy was the third aim which required consideration of using noise management to enhance the quality of the sound environment and not simply to focus on reducing the adverse impacts of noise.

### NOISE POLICY OVERVIEW IN ENGLAND

The graphic at Figure 1 shows the current legislative and policy framework for noise management in England

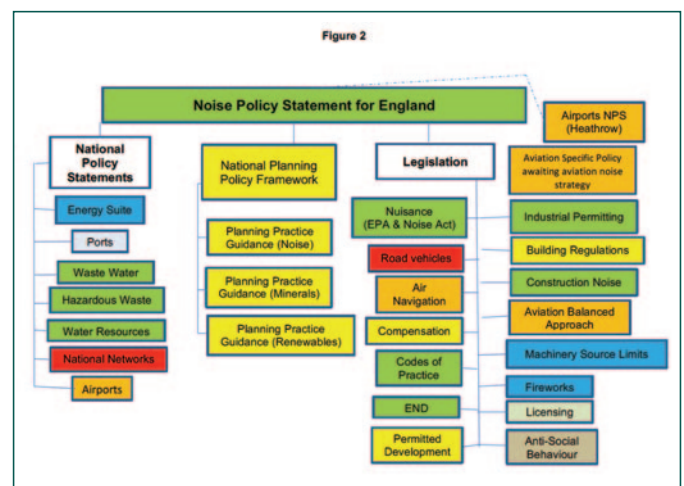
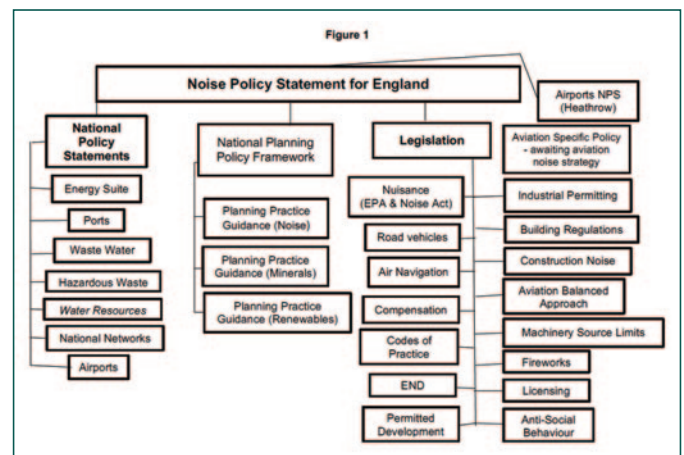
The NPSE can be seen as the over-arching policy. Underneath that is the suite of National Policy Statements for Major

extremely helpful to practitioners.

Figure 2 shows the same information but this time colour-coded to show the different Government departments or parts of departments who are responsible for that policy area.

- So, Defra is shown as ;
  - MHCLG is ;
  - DfT (Aviation) is ;
  - DfT (Roads) is ;
  - BEIS is
- and so on.

Noise management is spread over at least 8 different departments or parts of departments.



Infrastructure Projects; the suite of land use planning policies and guidance and the range of legislation, some of which date back to the 1970s. Because of the NPSE, there is a now a lot of policy consistency which again is

### THE NOISE MANAGEMENT CHALLENGE

In principle, there is nothing fundamentally wrong with this arrangement. The ubiquitous

nature of noise inevitably means that it touches on a large number of policy areas. The challenge comes because for most officials, noise management is only a small part of their portfolio. Furthermore, there are only two trained acousticians in Whitehall to assist them.

Consequently, this arrangement can lead to uneven implementation of policy; incomplete management of noise or unintended consequences.

One example was the granting of permitted development rights to convert offices into residential premises to assist with tackling the housing shortage. Initially, there was no requirement to consider the impact of the nearby noise environment on the new residents. Soon there were complaints from the new residents who found themselves being affected by noise in the evening and night from nearby entertainment venues. Previously, the dwellings had been an office and there was no-one living there who would be disturbed.

It took a while, but eventually there were changes to the Permitted Development Regulations (PDR) that required consideration of the potential noise impact on the new dwellings from nearby commercial activities.

But the current state of the PDR still means that offices close to motorways can be converted to dwellings without any formal requirement to consider the noise impact on those dwellings from the traffic using the motorway.

There are potential future risks as well. In October last year, MHCLG published its consultation on the Future Homes Standard. In it stated that:

*We anticipate that the installation of heat pumps, particularly air-to-water and air-to-air heat pumps, will play a major role in delivering low carbon heat for homes built to the Future Homes Standard.*

Again, this is an extremely laudable desire, but there was no mention of noise. Effectively, the Government is advocating going from a gas boiler that has a small fan and is located indoors to an air source heat pump which has a larger fan and is located outdoors. The Institute of Acoustics (IOA) have raised its concern in its response to that consultation.

## WHAT TO DO?

At present we have members of the IOA who work in all the aspects of noise management mentioned. We also have the range of Government departments with some responsibility for noise management. What appears to be missing is some central political oversight of noise management that can bring together the professionals of the IOA and the relevant policy officials. One possible solution is the establishment of an All-Party Parliamentary Group on Sound and Noise Management. Although it is recognised that there are many of these groups already, the data shown above demonstrates that the effective management of noise is very important for the health and quality of life of the citizens of the UK. The Institute of Acoustics believes that there is a need to secure the right level of political traction to make this happen and is keen to work with the Parliamentary and Scientific Committee to help this to occur.

### Note about the Institute of Acoustics:

The Institute of Acoustics is the professional body for those working in the field of acoustics

and noise management. Its members include consultants, academics and regulators. Its activities include working for industry, developers, government and local authorities in all matters associated with sound and noise management in the natural and built environment. It has just over 3000 members and the acoustics profession generates about £4.6bn per annum to the economy.

## References

- 1 Research over the last 20 years or so has shown that long exposure to higher levels of environmental noise is associated with an increased risk of cardio-vascular disease and other similar effects. Thus, although someone living close to a busy road may say they are not bothered by the traffic noise, they may yet be experiencing effects that are harmful to their health
- 2 The Institute of Acoustics is using its resources to try to quantify this change in noise impact whilst observing the social isolation rules.
- 3 Source: <https://www.rheglobal.com/news/614913981658890240/noise-complaints-surge-during-covid-19-lockdown>
- 4 Source: World Health Organization
- 5 Source: European Environment Agency
- 6 Ibid
- 7 Source: UK Government
- 8 Source: National Noise Attitude Study 2012
- 9 Source: Public Health Outcomes Framework
- 10 Source: National Noise Attitude Study 2012
- 11 This web page has a banner statement that says "This was published under the 2005 to 2010 Labour government". It has never been clear what is the purpose of such a statement. The date on the document clearly shows when it was published and it is the current policy on noise management which subsequent administrations have confirmed it to be. Yet the presence of this banner risks diluting the weight that should be placed on this key policy document.