

# Is Noise a Problem for the Citizen?

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## Summary

This presentation will consider the issue of transportation noise from the perspective of the citizen. There are some whose lives are significantly adversely affected by transport noise and who might expect the Environmental Noise Directive (END) to help make their lives better. For others, transport noise is an irritant that they would prefer not to experience, and they, too, might expect the END to help. But there are other citizens who would object to their lives being disrupted if measures were introduced to reduce noise that caused them to experience restricted choice of travel or found their movement was inhibited. This presentation will examine these tensions in the context of the future direction of European Noise Policy.

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## 1. Background

Disturbance from noise arising from people using a transport infrastructure has occurred virtually ever since society developed a means of transport other than walking. There is evidence that, in ancient Rome, measures were put in place to deal with the sleep disturbance that was otherwise being caused by ironed wheeled wagons travelling over the stone roads. In medieval Europe, horse drawn carriages and horse back riding caused disturbance, particularly at night. And whilst developing their constitution, the founding fathers of the United States insisted that soil be laid on the cobbled street outside so that they were not disturbed by carts rattling along the road. It can be seen, therefore, that for centuries, noise has been a problem for some citizens.

That problem intensified with the introduction of the railway, the invention of the internal combustion engine and with the development of powered flight. In the UK, the issue of the potential impact of aircraft noise was recognised early on, but such that legislation was passed in 1920 that prohibited action from being taken against the noise coming from an over-flying aircraft. This was to prevent the growth of the then fledgling aviation industry from being hampered. That legislation exists today.

It was only from the 1960s that systematic measures started to be put in place to control the noise generated by individual vehicles and aircraft. Up until then, the legislation in the UK, for example, simply required that motor vehicles

should not cause excessive noise as a result of poor maintenance or a defect in design.

In the 20<sup>th</sup> century there was a huge increase in the use of powered transport and that, in turn, greatly increased the risk of noise disturbance. In the mid 1990s, there was concern that this increase in traffic was outpacing the benefit that the noise limits being imposed on individual road vehicles were achieving. That concern was one of the main reasons for the Environmental Noise Directive coming into being.

## 2. Current Attitudes to Transport Noise

In the UK, three national surveys have been undertaken to determine the attitudes of population to a variety of noise sources. These occurred in 1991, 1999/2000 and 2012. The results of that last survey were published at the end of 2014 and included information about the change in attitude to road and aviation sources over the first decade of the 21<sup>st</sup> century [1].

Table I. Proportion of the population (%) hearing the source.

	<i>1999/2000</i>	<i>2012</i>	<i>Change</i>
Road	84	83	-1
Aircraft	71	72	+1

Table II. Proportion of the population (%) ‘very’ or ‘extremely’ bothered, annoyed or disturbed by the source.

	1999/2000	2012	Change
Road	8	8	0
Aircraft	2	4	+2

Table III. Proportion of the population (%) bothered, annoyed or disturbed to some extent by the source.

	1999/2000	2012	Change
Road	40	55	+15
Aircraft	20	31	+11

This evidence suggests, albeit based on UK results, that noise from transport sources remains a problem to some extent for many citizens.

### 2.1. Non-Cognitive Effects

The results of those attitude studies show the cognitive effects of noise, where the citizen is reacting to the noise and is aware of that reaction. However, over the last 20 years there has been increasing evidence of non-cognitive physiological effects also arising from long term exposure to transport noise. These effects can manifest themselves as an increased risk of experiencing, for example, hypertension or cardiovascular disease. For these non-cognitive effects, noise exposure can be a problem for the citizen, but the citizen is not aware of it. At the moment, the evidence suggests that the increased risks are not large and only occur at higher levels of exposure. Consequently, the extent of the non-cognitive effects is not as widespread as, say, the annoyance that can arise.

## 3. Policy for the Management of Noise

The measures available for managing noise are well established, including (for road traffic):

- reducing the noise of the individual vehicle;
- locating roads away from dwellings;
- using barriers or other similar techniques for reducing the propagation of sound; and
- providing additional building envelope sound insulation so that the level of intrusive noise into the building is

controlled (even if the external acoustic environment is not altered).

### 3.1. Noise Policy Statement for England

It is, however, up to policy makers to decide the extent to which such measures should be implemented. Five years ago saw the publication of the Noise Policy Statement for England (NPSE) [2] with its vision which states:

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

That vision is supported by three 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.*

This policy includes a very important phrase: “within the context of Government Policy on sustainable development”. The purpose of that phrase in the NPSE is to recognise that some noise generating activities provide value to society or are even demanded by society. Transport sources fall into that category, and whilst it would be ideal for a transport infrastructure to cause no adverse effect from the noise it generates, such an ideal is not going to occur in the foreseeable future. The ‘in the context’ phrase, therefore, recognises that a balance has to be struck.

### 3.2. 7<sup>th</sup> Environmental Action Programme

In 2013, through Decision 1386/2013/EU, the General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’ was published [3]. This document is generally known as the 7<sup>th</sup> EAP. In that the following target can be found with respect to noise:

*In order to safeguard the Union’s citizens from environment-related pressures and risks to health and well-being, the 7th EAP shall ensure that by 2020: .....*

- (b) *noise pollution in the Union has significantly decreased, moving closer to WHO recommended levels;*

There many issues regarding the how this target might be interpreted, but in this discussion there are two key issues:

1. What precisely is meant by ‘moving closer to WHO recommended levels’;
2. What would be the cost to society of achieving that target?

### 3.3. WHO Recommended Levels

The WHO first published noise guidelines in 1980. That document and subsequent publications, for the most part, provide information regarding the noise exposure at which adverse effects start to be discerned. It is probably accepted that at those thresholds, not all citizens would necessarily experience the effect being studied, but as the exposure increases, the manifestation and extent of the adverse effect would increase. The Night Noise Guidelines for Europe, published in 2009 [4] was clear when it stated:

*L<sub>night,outside</sub> of 40 dB is equivalent to the lowest observed adverse effect level (LOAEL) for night noise*

which effectively means that the WHO view is that no adverse effect whatsoever occurs below an  $L_{\text{night,outside}}$  of 40 dB.

This could be, however, a WHO guideline as mentioned in the 7<sup>th</sup> EAP. Is it reasonable to conclude, therefore, that the 7<sup>th</sup> EAP target has an implied aspiration, in the case of night noise, that ultimately no-one in the European Union is exposed to night noise above 40 dB, and that by 2020, significant progress is to be made to achieving that goal?

### 3.4. Cost to Society of Achieving the 7<sup>th</sup> EAP target

From the European Environment Agency’s Noise Observation and Information Service for Europe, it appears that over 20 million people in agglomerations are currently exposed to night noise of 50 dB or more from road traffic. It seems highly unlikely that it will be possible significantly to reduce that figure by 2020 using the current range of measures that are readily available.

There was a relatively recent change in the regulations governing the permitted noise from vehicles [5]. Adopted in 2014, a new regulation on vehicle noise includes reductions of 2 dB(A) in each of two steps giving a 4 dB(A) reduction in total, coming into force over a period of about 11 years. Even then, there would be a considerable

period of time before the vehicles operating under those new limits become dominant in the overall mix of traffic. So, even if the number of vehicles using the roads remained unchanged, it will be many years before the source levels reduce by only a few decibels.

If the 7<sup>th</sup> EAP target is to be met regarding road traffic noise at night, it seems that the only options would be imposing severe restrictions on the use of vehicles between 23.00 and 07.00. But would the citizens be content with such restrictions? Probably not. Furthermore, the cost to society of such measures would probably be huge. If such an approach was pursued, noise would become a very different problem for the citizen!

## 4. The Way Forward

Noise exposure is currently a problem for many citizens to a greater or lesser extent and it is right that society seeks to manage the impact and effects of noise exposure. However, society must also recognise that, for the moment, adverse effects of noise are an inevitable consequence of our desire and need to travel by road, rail and air. Policy, therefore, has to recognise that a balance must be struck between the management of noise and the need for a flourishing society. The Noise Policy Statement for England provides the necessary balance. However, the current European policy as expressed in the 7<sup>th</sup> EAP does not, appearing, instead, to seek that very laudable ambitious targets are met for noise reduction, seemingly ignoring the potential cost on society. European noise policy must be careful, therefore, that, in its desire to solve the problem some citizens currently have with noise, it does not create a different type of noise problem for the citizen.

## References

- [1] H. Notley: National Noise Attitude Study 2012 (NNAS 2012), Department for Environment, Food & Rural Affairs, UK, 2014.
- [2] Noise Policy Statement for England, Department for Environment, Food & Rural Affairs, UK, 2010.
- [3] General Union Environment Action Programme to 2020 ‘Living Well within the limits of our planet’ Decision 1386/2013/EU, 2013.
- [4] Night Noise Guidelines for Europe, World Health Organisation, 2009.
- [5] Sound level of motor vehicles and of replacement silencing systems etc, Regulation 540/2014/EU, 2014

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