Institute of Acoustics

Briefing Note

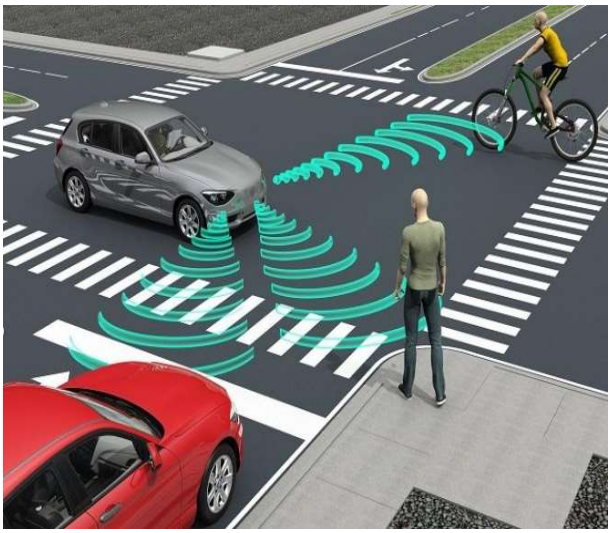
Reducing the Health and Social Costs of Road Noise

It has been estimated[1] that the annual social cost of urban road noise in England ranges from £7 billion to £10 billion, similar to road accidents (£9 billion) and significantly exceeding the impact of climate change (£1 - 4 billion). Environmental noise was identified by the World Health Organization (WHO) in 2011 as the second-largest environmental health risk in Western Europe. Over four times as many people in Europe are estimated to be affected by high levels of road traffic noise than by rail, aircraft and industrial noise put together[2] making it evident that road noise pollution continues to pose a serious ongoing challenge.

In the 2021 *Net Zero Strategy*[3]*: Build Back Greener*, then-Prime Minister Boris Johnson stated, *"In 2050, we will still be driving cars, flying planes and heating our homes, but our cars will be electric, gliding silently around our cities."* While this paints a compelling vision of quieter streets, research[4] shows that adopting electric vehicles (EV) alone will not significantly reduce road traffic noise.

Why EVs Won't Solve the Noise Pollution Problem

At speeds up to 20 km/h EVs are required to have added sound to protect vulnerable road users which includes the vision impaired[5]. At speeds above 40–50 km/h, the dominant source of road traffic noise is no longer the vehicle's engine but the interaction between its tyres and the road surface. This means that the quieter propulsion of electric vehicles only offers small noise reductions at speeds around 50 km/h. At higher speeds, noise reductions are typically in the range of 0.1 to 0.5 decibels (dB) which, for mixed traffic conditions, would be barely noticeable. By comparison, a change in road surface material can reduce noise by up to 6 dB[6] - a clearly perceptible change in the level of sound we hear.



Thus, relying solely on EV adoption as a noise reduction strategy, risks ignoring the more significant contributors to environmental traffic noise.

[1] Noise pollution: economic analysis - GOV.UK
[2] EEA Report: Environmental Noise in Europe
[3] https://assets.publishing.service.gov.uk/media/6194dfa4d3bf7f0555071b1b/net-zero-strategy-beis.pdf
[4] Phil Morgan, Matthew Muirhead, Sara Gasparoni, Marco Conter, Marie-Agnès Pallas, et al.. FOREVER Future Operational Impacts of Electric Vehicles on European Roads Final technical summary report. [Research Report] IFSTTAR- Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux. 2015, 21 p. hal-02177734
[5] UNECE Reg138 Uniform provisions concerning the approval of Quiet Road Transport Vehicles with regard to their reduced audibility
[6] M Muirhead, L Morris, RE Stait (2010), The performance of quieter surfaces over time, PPR485, TRL Limited.

The Case for Resurfacing Roads

Low-noise road surfaces are a proven, and often cost-effective solution to tackling environmental noise pollution. By resurfacing roads with materials designed to minimise tyre-road noise, reductions of around 6 dB can be achieved. Such a change has a profound impact: every 3 dB reduction is equivalent to halving the number of vehicles on the road in terms of noise exposure. Countries like the Netherlands and Denmark have successfully implemented quiet road surfacing strategies, demonstrating that this is a scalable and practical solution the national road administrations have their own guidelines on the use of low noise surfacing. These measures not only improve public health and well-being but also complement the UK's transition to sustainable transport by addressing noise pollution at its source.

Recommendations for Action

1. Prioritise Investment in Quiet Road Surfacing
Policymakers should focus on supporting the resurfacing of urban and suburban roads with low-noise materials as part of infrastructure renewal.

2. Incentivise Research and Development
The Department for Transport and the Engineering and Physical Sciences Research Council should continue to encourage innovation in tyre[7] technology and road surfacing materials to further mitigate noise pollution while maintaining acceptable levels of durability, skid resistance and particle wear.

3. A holistic approach to noise in Transport Policy
As the Welsh government have done[8,9], policymakers should treat noise pollution as a critical component of environmental health strategies alongside air quality and carbon emissions.

4. Engage the Public
The role that Government departments are playing in raising awareness of the health impacts of traffic noise pollution is highly valued. This could be enhanced by also promoting the tangible benefits of effective road noise mitigation such as speed reductions, alternative forms of transport and quiet road surfaces.

A Balanced Approach to Noise Pollution

While the adoption of EVs is a step toward a greener future, it is not a silver bullet for noise pollution. By combining the rollout of electric vehicles with targeted investments in low-noise road surfacing, the UK can achieve meaningful progress in reducing environmental noise. This dual approach ensures a healthier, quieter, and more sustainable urban environment for all.

To find out more: email: Briefings@ioa.org.uk

With thanks to EUR ING Teli Chinelis MIOA, CEng, MImechE, CEnv and Matthew Muirhead FIOA, MIMA, PhD, CMath (AECOM) for preparing this note.

[7] Tyre noise dominates at higher speeds, limiting the noise reduction benefits of EVs. While some tyres claim to be "low-noise," their performance depends heavily on road surfaces. Tyres for EVs often focus on efficiency rather than noise reduction, highlighting the need for holistic approaches combining tyre and road surface design.
[8] The Environment (Air Quality and Soundscapes) (Wales) Bill
[9] https://www.gov.wales/noise-and-soundscape-plan-for-wales-2023-2028