TAN 11 Call for Evidence Consultation Response Form

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Effective strategic action through development plans

1. Please provide examples of good practice in Wales or elsewhere where air quality and/or soundscape have formed a part of developing plan strategies for the location of new development or facilitating a placemaking approach as part of plan making;

The existing Tranquillity Map for Wales 2009 is a map and report of Wales graded to show levels of Tranquillity resulting from combining several spatial datasets that either contribute to, or detract from tranquillity. Several elements include soundscape or allude to soundscape. It was produced to provide a strategic baseline for monitoring change in tranquillity in Wales to inform strategic planning and policy-making. http://lle.gov.wales/catalogue/item/TranquilAreasWales?lang=en . It can be used by local planning authorities in the planning process, and has been used by NRW for informing landscape narratives for 6 terrestrial Area Statements, Landscape Character Assessments, LANDMAP visual and sensory evidence and seascape assessments.

2. Please provide examples of good practice in Wales or elsewhere where wider mitigation solutions have been developed to reduce air and noise pollution and/or avoid exacerbating existing air quality or soundscape problems as part of developing strategies for the location of new development or in facilitating a placemaking approach;

The best way to reduce traffic noise and air pollution is to reduce the amount of road traffic because even electric vehicles still make noise and produce air pollution from their brakes and road friction (Air Pollution in Wales 2018. The Welsh Government. Section 7 Non-Exhaust Emissions of Particulate Matter – An increasing challenge). The Greater London Authority recommend creating green and attractive active travel routes because this has the dual effect of reducing the demand to use vehicle transport and it protects people from exposure to any remaining traffic pollution by

taking them away from the source of that pollution (Using Green Infrastructure to Protect People from Air Pollution. Greater London Authority. 2019).

Green Infrastructure Assessments as recommended in Planning Policy Wales should help planning authorities to identify appropriate locations for attractive active travel routes.

3. Please provide views on the nature and scope of air quality and soundscape information and/or evidence required to support effective plan making;

The HOSANNA project undertook fundamental research and produced an evidence-based guide to the use of green infrastructure in the reduction of environmental noise. The techniques described in this guide are applicable at scales from the strategic to individual structures. One of the key findings was that carefully selected combinations of green infrastructure elements could provide very cost-effective solutions to controlling noise from sources such as transport (Novel Solutions for Quieter and Greener Cities. The project was coordinated by Chalmers University of Technology (coordinator: Jens Forssén). The research received funding from the European Union Seventh Framework Programme (FP7/2007–2013) under grant agreement n° 234306, collaborative project HOSANNA http://publications.lib.chalmers.se/records/fulltext/208780/local_208780.pdf).

Very recent research provides guidance on the use of trees and green infrastructure to control air pollution and suggests that even in street canyons trees may still be an effective means of controlling particulate air pollution (Designing vegetation barriers for urban air pollution abatement: a practical review for appropriate plant species selection. Yendle Barwise, Prashant Kumar. npj Climate and Atmospheric Science (2020) 3:12 ; https://doi.org/10.1038/s41612-020-0115-3). Given their importance for delivering other ecosystem services in urban areas such as shade, stress reduction, air cooling, and flood mitigation this suggests that trees should be recommended as important components of air pollution control and the creation of appropriate soundscapes.

NRW propose to update the Wales Tranquillity & Place Map and report (as described in our response to Q1 above). This will be an all-Wales, nationally consistent assessment of the tranquillity resource and will give recognition that the value of tranquillity to people is relative to context (e.g. decibels and appropriate sounds for context/place). It will be mapped so that it can be used as both a strategic and local resource, will consider temporal factors, cumulative and in-combination factors. The outputs will be mindful of tranquillity as a positive resource and current policy and political contexts such as the aspiration to increase renewable energy deployment in Wales to meet decarbonisation targets.

4. Please provide views on how evidence and/or information relating to air quality and soundscape should be used alongside other evidence necessary to support effective plan making and how this evidence could be used in an integrated way to facilitate better placemaking outcomes; and,

Our Tranquillity Maps (as described in our response to Question 1 above) can be used alongside other evidence in Wellbeing Assessments, Green Infrastructure

Assessments and Area Statements. It is often referred to by planning authorities in relation to plan making that includes landscape character and quality for better outcomes. It could also inform the Noise and Soundscape Action Plan and the Wales National Marine Plan (on shipping light).

Noise maps used by Public Service Boards as evidence in assessments of local well-being may in future be informed by soundscape information set out in our proposed new Tranquillity Mapping (see our response to Question 1 above). It could relate to proposed work in Cardiff University with their academic research submission on place-based, policy-relevant soundscape approaches to integrate community perspectives on tranquillity and wellbeing towards building resilient and biodiverse protected areas

5. Please provide any further detailed guidance and support in relation to air quality and soundscape which would be beneficial to support effective plan making and which is not covered by 1)-4) above.

Tools exist which may help to objectively assess the impact of green infrastructure in improving the tranquillity of public spaces. A number of these tools are available e.g. TRAPT (Tranquillity Rating Prediction Tool) and the Welsh Government may wish to consider recommending the use of an appropriate tool in the forthcoming TAN. (The effects of “greening” urban areas on the
perceptions of tranquillity. G R Watts. Urban Forestry & Urban Greening. Volume 26, August 2017, Pages 11-17. http://dx.doi.org/10.1016/j.ufug.2017.05.010)

Development proposals and development management

6. Please provide examples of good planning practice guidance in Wales or elsewhere aimed at reducing, avoiding or minimising the impacts of airborne pollution;

Guidance on the impact of air quality on sites for nature conservation may be of use in this context: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf

7. Please provide examples of good practice in Wales or elsewhere where design has been effectively used to reduce, avoid or minimise the impacts of airborne pollution;

NRW offers no response to this question.

8. Please provide examples of successful mitigation being secured as part of planning applications and being effectively implemented;

NRW offers no response to this question.

9. Please provide information and/or views on the nature and scope of air quality and soundscape information and/or evidence required to support effective decision making on planning applications;

The existing and proposed update of tranquillity evidence can be used to quantify and understand how changes in the rural, peri-urban and urban landscape are challenging or improving tranquillity and soundscapes. Additionally, it will consider how change has directly and indirectly affected landscape character and quality, which informs the LANDMAP Visual & Sensory dataset and associated landscape monitoring. It will help identify 'reservoirs' of relative tranquillity, both as large areas and locally important areas close to where people live that can inform decision making on planning applications, and Landscape and Visual Impact assessments as part of an EIA and SPG on tranquillity and soundscape. Tranquillity (and therefore soundscape too) is often a special quality of Welsh National Parks and Areas of Outstanding Natural Beauty, understanding this can support national park and AONB management plans, planning applications and state of reports.

10. Please provide any information and thoughts on barriers, perceived or practical, to achieving better design outcomes and effective mitigation; and,

NRW offers no response to this question.

11. Please provide any further detailed guidance and support in relation to air quality and soundscape which would be beneficial to support better placemaking outcomes through development management which is not covered by 6)-10) above.

Although strips of densely planted roadside vegetation can reduce noise pollution by only modest amounts (2-3 dB), they provide several other benefits like reducing the perception of noise, improving road safety by absorbing collision impacts more slowly than metal barriers, and reducing headlight glare. (Optimising UK urban road verge contributions to biodiversity and ecosystem services with cost-effective management. Odhran S. O'Sullivan, Alison R. Holt, Philip H. Warren, Karl L. Evans. Journal of Environmental Management 191 (2017) 162e171). If composed of appropriate species these strips may also support biodiversity and should therefore be considered for mitigating road noise.

There is some evidence that human noise may be a strong selective force shaping the ecology of birds. Larger birds which sing or call at lower frequencies may be excluded from noisy areas, whereas smaller species which call or sing at higher frequencies may persist in those areas. (Francis, C. D., Ortega, C. P., & Cruz, A. (2011). Noise pollution filters bird communities based on vocal frequency. PLoS ONE, 6(11), e27052. https://doi.org/10.1371/journal.pone.0027052). Environmental noise can reduce breeding ability in songbirds by affecting the way parents communicate with their chicks (Passerine birds breeding under chronic noise experience reduced fitness. J Schroeder, S Nakagawa, IR Cleasby, T Burke - PLoS one, 2012 7(7): e39200. doi:10.1371/journal.pone.0039200). At least one study has found that managing noise levels as well as tree density can help maintain more complex bird communities in densely populated urban areas (Fontana, C.S., Burger, M.I. & Magnusson, W.E. (2011). Bird diversity in a subtropical South-American City effects of noise levels, arborisation and human population density. Urban Ecosyst., 14, 341–360). It may be reasonable to suggest that similar measures in Wales could help mitigate the effect of development. Planting appropriate types and numbers of

trees as well as controlling environmental noise confer benefits to human wellbeing as well as conserving biodiversity.

Trees may form important components of noise barriers and new evidence has come to light that bark structure and the presence of epiphytes is important to their absorbing characteristics (Applied Acoustics Volume 165, August 2020, 107328 Sound absorption by tree bark. Mengmeng Li, Timothy Van Renterghem, Jian Kang, Kris Verheyen, Dick Botteldooren. https://www.sciencedirect.com/science/article/abs/pii/S0003682X20300372). Recent studies (*The epiphyte flora of roadside trees in the London conurbation with a North American perspective on its possible future*. Jeff Duckett & Silvia Pressel 2019 in Field Bryology 122) show abundant colonisation of street trees by NOx-tolerant mosses and liverworts. These bryophyte layers are able to accumulate particulate pollution by adhesion (e.g. Anna Di Palma, Fiore Capozzi, Valeria Spagnuolo, Simonetta Giordano, Paola Adamo 2017, Atmospheric particulate matter intercepted by moss-bags: Relations to moss trace element uptake and land use, Chemosphere, Volume 176) including many in the “inhalable fraction” and then take it to ground level when they drop off the trees. Once on the ground, at least some of the particulates will be incorporated in soil or washed away into drains along with the mosses they are adhered to. Epiphytic mosses and lichens also absorb rainfall, providing significantly greater absorbing capacity than a bare tree or a concrete/tarmac street, which could help in SUDS design. Planting street trees with base-rich bark, such as Maples, will enhance street tree epiphyte abundance, enhancing structural complexity and helping accumulate particulates and rainfall. These are further reasons for including properly chosen and carefully placed trees as part of noise mitigation and air pollution control measures.

Question 12: We would like to know your views on the effects that any information provided would have on the Welsh language, specifically on opportunities for people to use Welsh and on treating the Welsh language no less favourably than English.

What effects do you think there would be? How could positive effects be increased, or negative effects be mitigated?

NRW offers no response to this question.

Question 13: We have asked a number of specific questions. If you have any related issues which we have not specifically addressed, please use this space to report them:

Please enter here: NRW offers no response to this question.

Responses to consultations are likely to be made public, on the internet or in a report. If you would prefer your response to remain anonymous, please tick here:

NRW is content for this response to be made public.