

# **1/2011 PLANNING AND NOISE**

# **Planning Advice Note**

**PAN 1/2011**

# **PLANNING AND NOISE**

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## **PREFACE:**

This Planning Advice Note (PAN) provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. Information and advice on noise impact assessment methods is provided in the associated Technical Advice Note Assessment of Noise. Appendix 3 of the Technical Advice Note provides Excel Workbooks which have been included to assist in the technical evaluation of noise assessment as part of the planning process.

PAN 1/2011: Planning and Noise supersedes Circular 10/1999 Planning and Noise and PAN 56 Planning and Noise, which are now revoked.



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## INTRODUCTION

1. This Planning Advice Note (PAN) provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. It supersedes Circular 10/1999 *Planning and Noise* and PAN 56 *Planning and Noise*. Information and advice on noise impact assessment (NIA) methods is provided in the associated Technical Advice Note. It includes details of the legislation, technical standards and codes of practice for specific noise issues.
2. The PAN promotes the principles of good acoustic design and a sensitive approach to the location of new development. It promotes the appropriate location of new potentially noisy development, and a pragmatic approach to the location of new development within the vicinity of existing noise generating uses, to ensure that quality of life is not unreasonably affected and that new development continues to support sustainable economic growth. Environmental Health Officers and/or professional acousticians should be involved at an early stage in development proposals which are likely to have significant adverse noise impacts or be affected by existing noisy developments.
3. The [Environmental Noise \(Scotland\) Regulations 2006](#) transposed the [European Directive 2002/49/EC](#) (the Environmental Noise Directive) into Scottish law. The Regulations affect large urban areas; major transport corridors and major airports. They require Scottish Ministers and airport authorities to manage noise through a process of strategic noise mapping and noise action plans. In the areas affected by the Regulations, planning authorities have a role in helping to prevent and limit the adverse effects of environmental noise. Areas affected by the Regulations can be seen on the [Scottish Noise Mapping](#) website.

## BACKGROUND

4. Unwanted noise can have a significant impact upon environmental quality, public health and amenity. It is important to be aware of the sources of noise in the environment in order to minimise or prevent its effects. Common sources of noise include road vehicles, aircraft, railways, industry, landfill operations, construction, commercial premises and entertainment venues, and sport and recreation venues. The Environmental Noise Directive (END) describes environmental noise as "*unwanted or harmful outdoor sound created by public activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity*" (Directive 2002/49/EC, article 3). It focuses on the impact of such noise on individuals and serves to prevent noise levels that would endanger the health and quality of life of any person. END does not apply to noise that is caused by the person exposed to the noise, noise from domestic activities, workplace noise or noise inside means of transport or due to military activities in military areas.

5. Noise is measured in decibels (dB), where zero dB is the lower limit of audibility and 140 dB is the level at which physical pain in the ear may be felt. Individual sensitivity to noise is highly subjective and is affected by a range of factors. As these can include non-acoustic matters, such as attitude to the noise source, sensitivity may not always relate directly to the level of noise.
- Decibel (dB): a unit derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities, including noise.
  - dB(A): decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. For noise of a similar character, a change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound.
6. Some common sounds and their decibel ratings at source are:
- Unsilenced pneumatic drill (at 7m distance) – 95dB(A)
  - Heavy diesel lorry (40km/h at 7m distance) – 83dB(A)
  - Modern twin-engine jet (at take-off at 152m distance) – 81dB(A)
  - Passenger car (60 km/h at 7m distance) – 70dB(A)
  - Office environment – 60dB(A)
  - Ordinary conversation – 50dB(A)
  - Quiet bedroom – 35dB(A)

## **ENVIRONMENTAL NOISE (SCOTLAND) REGULATIONS 2006**

7. The Environmental Noise (Scotland) Regulations 2006 introduced strategic noise mapping and noise action planning for large urban areas, major transport corridors and major airports. Scottish Ministers must prepare Strategic Noise Maps and Noise Action Plans which identify Quiet Areas and areas where management of noise is required. The Scottish Government has identified such areas as Noise Management Areas (NMAs). The Noise Action Plans must include measures to manage noise. Airport Operators must prepare Strategic Noise Maps and Noise Action Plans for places near airports.

8. [Strategic Noise Maps](#) identify the scale of noise from transport and industrial related sources on a local level and present information on areas where the population is most exposed to noise from this source. They are the basis for the development of [Noise Action Plans](#) and show average noise levels for an average day in the year calculated on the basis of a 10m grid and height of 4m above ground level. Strategic Noise Maps should not be used for a detailed noise assessment, but they do show the noise situation within the following areas:
  - Agglomerations (urban areas) with more than 250,000 inhabitants<sup>1</sup>, and
  - Areas near major airports with over 50,000 movements per year
  - Areas near major roads which have more than 6 million passages a year
  - Areas near major railways which have more than 60,000 passages a yearFrom 2012, Strategic Noise Maps will also show the noise situation for:
  - Agglomerations with more than 100,000 inhabitants,
  - Areas near major roads which have more than 3 million vehicle passages a year, and
  - Areas near major railways which have more than 30,000 passages a year.
9. Based on the results of the noise mapping exercise, Scottish Ministers and Airport Operators must publish Noise Action Plans which include population noise exposure information and set out noise abatement measures designed to manage, avoid, prevent or reduce, on a prioritised basis, the harmful effects of environmental noise exposure in the NMAs. These action plans should also set out noise abatement measures to protect environmental noise quality where it is good, for example in Quiet Areas within urban areas and within NMAs. Quiet Areas are defined in Noise Action Plans.
10. The results of the noise mapping and action planning will be reported to the European Commission every 5 years, focusing on the number of people exposed to noise in 5dB noise bands. The planning system has a role in ensuring that new development does not result in increasing numbers of people exposed to adverse noise impacts. The preferred approach is to plan for good environmental quality, including the noise climate, from the outset rather than to try to mitigate the effects in retrospect.

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<sup>1</sup> Agglomerations are urban areas with a population density equal to or greater than 500 people per km<sup>2</sup>



## DEVELOPMENT PLANNING

11. By guiding development to the right locations and where necessary, specifying design and layout issues, planning authorities can help to prevent and minimise the consequences of noise. Development plans have an important role to play in helping to limit the overall number of people exposed to the potential adverse effects of noise. Developments which are likely to generate a significant level of noise do not generally make good neighbours with noise sensitive land uses such as housing, hospitals, educational establishments, offices, places of worship and nursing homes and some livestock farms. Development plans can, where relevant, indicate the range of uses which are likely to be permitted in an area affected by existing or potentially high levels of noise, including NMAs, as well as the noise mitigation measures the planning authority will expect to be applied to new development. Planning authorities may also discourage noisy development in areas that are been relatively undisturbed by noise.
12. The following issues may be relevant when considering noise issues during the preparation of a development plan:
  - Avoidance of significant adverse noise impacts from new developments,
  - Applying noise impact criteria reasonably,
  - Use of mitigation measures to manage noise impacts,
  - Protection of Quiet Areas, and
  - Avoidance of development significantly adversely affecting Noise Management Areas.
13. The effects of noise can impact on other issues which may be considered within the strategic environmental assessment (SEA) of a strategic or local development plan and/or supplementary guidance (e.g. population, human health, biodiversity and fauna). Potential mitigation measures can be included in the environmental report.

## DEVELOPMENT MANAGEMENT

14. The selection of a site, the design of a development and the conditions which may be attached to a planning permission can all play a part in preventing, controlling and mitigating the effects of noise. Discussions with the planning authority prior to submitting an application will assist in deciding the level of detail required from an applicant in respect of noise. The level of detail required should be balanced against the degree of risk to environmental quality, public health and amenity. More detailed assessments may be required for proposals that are likely to generate significant noise; for noise sensitive proposals which may affect existing noise sources and for proposals that may affect noise levels within or close to NMAs or Quiet Areas.

15. Issues which may be relevant when considering noise in relation to a development proposal include:
- Type of development and likelihood of significant noise impact,
  - Sensitivity of location (e.g. existing land uses, NMA, Quiet Area),
  - Existing noise level and likely change in noise levels,
  - Character (tonal, impulsivity etc), duration, frequency of any repetition and time of day of noise that is likely to be generated, and
  - Absolute level and possible dose-response relationships<sup>2</sup> e.g. health effects if robust data available.
16. It is preferable that satisfactory noise levels can be achieved within dwellings with the windows sufficiently open for ventilation. Local circumstances, particularly relating to the existing noise character of the area, should influence the approach taken to noise levels with open or closed windows. It may be appropriate to take a different approach to noise levels in different areas. It may also be appropriate to take a different approach to noise levels when considering the effects of new noisy development on existing residential properties from the approach taken to new residential development close to existing noisy land uses. Satisfactory internal noise levels with open windows may not always be achievable, but are always preferable. Where satisfactory levels with open windows are not achievable, practicable mitigation solutions should be explored, taking into account their possible impact on the built environment. Design solutions may be possible, such as locating living rooms and bedrooms on the opposite side of a building to the source of the noise or use of windows designed to provide for ventilation while providing improved sound reduction. In some circumstances however, closed windows with alternative means of ventilation may be unavoidable. Passive systems may be considered but mechanical ventilation should only be used as a last resort. Sound levels in gardens and amenity areas may also need to be considered in terms of enabling a reasonable degree of peaceful enjoyment of these spaces for residents.
17. Planning authorities should refer to Noise Action Plans when determining applications for development which may affect a Quiet Area or Noise Management Area. Development proposals which are likely to generate significant noise impacts may need to be advertised as Schedule 3 Development under Regulations 20(1)(c) and 38(1)(b) of the [Town and Country Planning \(Development Management Procedure\) \(Scotland\) Regulations 2008](#).
18. When considering applications for new noise sensitive development close to an existing noise source, the likely level of noise exposure at the time of the application and any increase that may reasonably be expected in the foreseeable future are likely to be relevant, as will the extent to which it is possible to mitigate the adverse effects of noise.

<sup>2</sup> The change in effect on a person caused by differing levels of exposure to noise after a certain exposure time

## NOISE IMPACT ASSESSMENT

19. The preparation and consideration of planning applications that raise significant noise issues can be greatly assisted by a Noise Impact Assessment (NIA). Planning authorities can require a NIA either as part of an Environmental Impact Assessment or separately. The need for noise impact assessments is best identified during pre-application discussions. The purpose of a NIA is to demonstrate whether any significant adverse noise impacts are likely to occur and if so, identify what effective measures could reduce, control and mitigate the noise impact. Before a NIA is commissioned, planning authorities and applicants are advised to:
- Agree any potential representative limits of noise and /or the relevant NIA methodology in the context of the proposed development, its location and the surrounding area, and
  - Establish criteria for assessing any significant adverse noise impact or predict and describe ambient noise levels (including noise from transport sources) that the proposed development is likely to generate and/or is likely to be subjected to.

For further information on NIA methodologies see the Technical Advice Note.

## MITIGATION MEASURES

20. A number of measures can be used to control the source of or limit exposure to noise. Such measures should be proportionate and reasonable. Possible measures include:
- **Engineering** - reduction of noise at point of generation (e.g. by using quiet machines and/or quiet methods of working); containment of noise generated (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site); and protection of surrounding noise-sensitive buildings (e.g. by improving sound insulation in these buildings and/or screening them by purpose-built barriers);
  - **Lay-out** - adequate distance between source and noise-sensitive buildings or areas; screening by natural barriers, other buildings, or non-critical rooms in a building;
  - **Operational** - limiting operating time of source; restricting activities allowed on the site and specifying an acceptable and reasonable noise limit. The implications of restricting hours of operation for the economic efficiency and operational capacity of a business over the longer term will need to be considered;
  - **Work sequencing** - programming and phasing construction or extraction activities to limit noise impact; use of acoustic screens around plant; limiting vehicle noise through speed control, road surfacing and driving style;
  - **Baffle mounds** – particularly relevant to mineral and landfill workings where they can be constructed from the top soil, sub-soil and over-burden which need to be removed and stored;

- **Acoustic fencing** - an alternative to baffle mounds or used on top of a mound to increase acoustic protection;
  - **Alternatives to vehicle reversing alarms** - include flashing lights during the night (but these may also cause a nuisance if not operated with care), radar-operated safety devices, audible “warble” devices, TV camera systems, and reduced level audible warnings for night time use;
  - **Off-site road traffic noise** – restriction of lorry movements to particular times or particular routes; low-noise road surfaces and road surface maintenance;
  - **Rail traffic** - low-noise rolling stock; low-noise tracks; and sensitive location of depots;
  - **Equipment selection** – setting noise limits for specific items of plant and equipment, e.g. those with certain tonal noise characteristics;
  - **Acoustic double glazing and secondary glazing for existing development** - this is unlikely to be appropriate as a response to noise caused by a new development. The use of double glazing and secondary glazing is not an alternative to other measures to control noise emissions or a means of legitimising higher noise limits.
21. Where appropriate, relevant and enforceable mitigation measures can be implemented through planning conditions and/or legal agreements. Conditions attached to a planning consent should meet the six policy tests set out in [Circular 4/1998 Use of Conditions in Planning Permissions](#). The [addendum](#) to Circular 4/1998 contains some examples of model conditions relating to the control of noise. Planning Agreements must meet the policy tests set out in [Circular 1/2010 Planning Agreements](#).

## POTENTIALLY NOISY DEVELOPMENTS

22. Advice on the assessment of some sources of noise is provided below. Further advice on Noise Impact Assessment methodology and technical standards is contained in the Technical Advice Note.

### ROADS

23. Road traffic noise impact assessments should take account of level, potential vibration, disturbance and variation in noise levels throughout the day, the pattern of vehicle movements and the configuration of the road system. When upgrading existing roads it will normally be sufficient to base noise assessments on the current measured noise level. When considering proposals for the development or improvement of major roads, forecast noise levels can be ascertained from the relevant roads authority. In some cases, roads authorities may have prepared predictions of the effects of road traffic noise but this will depend upon accurate data on traffic flow being available.

## **RAILWAYS**

24. Railway operators should have details of current traffic flows, and in some cases noise levels.

## **CIVIL AND MILITARY AERODROMES**

25. Noise from aerodromes is likely to include activities such as engine testing and ground movements as well as aircraft landing and taking off. For major aerodromes, (LAeq16hr) is the conventional unit of measurement for planning purposes, although different metric are used in the END noise mapping process. Where land is subject to significant levels of aircraft noise, or is likely to become so, planning authorities should seek the co-operation of aerodrome management in reaching appropriate forecasts of air traffic and its effect on noise contours. The objective will be to achieve a clear and stable pattern of constraints against which planning decisions can be made.
26. Military jets can generate very high noise levels, particularly during take off, and occasionally the effectiveness of noise abatement flight procedures normally adopted may be limited by operational requirements. Changes in aircraft type and number of movements may also occur over a short period, resulting in unpredictable changes in noise levels. However, military flying is usually concentrated into weekday working hours when background noise and daytime activity render aircraft noise less intrusive. Where disturbance caused by military aircraft is likely to occur from take-off and landing outside the boundaries of the planning authority area, affected authorities should be consulted.

## **HELICOPTERS AND HELIPOINTS**

27. Account should be taken of local circumstances, including the existing level of noise disturbance in the area surrounding the site and factors such as whether the area is already exposed to noise from fixed wing aircraft. Planning applications for heliports should be accompanied by information about the proposed take-off/landing flight paths, and air traffic routes where appropriate. Preferably, these paths should have been discussed and agreed in principle with National Air Traffic Services (NATS) beforehand. Planning conditions relating to flight routes are likely to be inappropriate.
28. For safety reasons, helicopters may only operate from elevated sites such as flat roofs if given special approval by the Civil Aviation Authority. All of these movements can cause disturbance locally but may be incidental or ancillary to the principal use of the land or of a temporary nature and so do not require planning permission. Voluntary agreements may be an effective way of limiting disturbance in these cases.

## WIND TURBINES

29. There are two sources of noise from wind turbines - the mechanical noise from the turbines and the aerodynamic noise from the blades. Mechanical noise is related to engineering design. Aerodynamic noise varies with rotor design and wind speed, and is generally greatest at low speeds. Good acoustical design and siting of turbines is essential to minimise the potential to generate noise. Web based planning advice on renewable technologies for [Onshore wind turbines](#) provides advice on 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97) published by the former Department of Trade and Industry [DTI] and the findings of the Salford University report into Aerodynamic Modulation of Wind Turbine Noise.

## OTHER RENEWABLE ENERGY TECHNOLOGIES

30. The noise and vibration characteristics of air source heat pumps may need to be considered. Other than in the circumstances set out by Circular 2/2010, planning permission continues to be required for air source heat pumps and noise assessments may be required to ensure that neighbours are not disturbed by their installation.

## INDUSTRIAL SOURCES

31. Due to its variable character industrial noise is generally difficult to assess. Since background noise levels vary throughout a 24 hour period it will usually be necessary for Noise Impact Assessments to assess the acceptability of noise levels for separate periods (e.g. day, evening, night and weekend) chosen to suit the hours of operation of the proposed development. Noise that may result from traffic generated by new industrial developments is likely to be a relevant consideration.

## CONSTRUCTION SITES

32. While planning conditions can be used to limit noise from temporary construction sites, it is most effectively controlled through the Control of Pollution Act 1974 and the Pollution and Prevention Control Act 1999 for relevant installations. Notice can be served in advance of works and site conditions set to control activities.

## RECREATIONAL AND SPORTING VENUES

33. For these activities, including open-air music concerts, off-road motor vehicle activities, motor racing circuits, water sports and clay target shooting, NIAs should take account of how frequently the noise will be generated and how disturbing it will be and should demonstrate that the proposed activity does not have an adverse impact on nearby noise sensitive land uses. Partially open buildings such as stadia may not be in frequent use and depending on local circumstances and public opinion, it may be reasonable to permit higher noise levels than for other types of development, subject to a limit on the hours of use, and the control of noise (including public address systems) during unsociable hours. Some noisy activities may not require planning permission because they occur on a temporary basis. However, these permitted development rights can be removed through a direction under Article 4 of the Town and Country Planning (General Permitted Development) (Scotland) Order 1992.

## ENTERTAINMENT VENUES

34. For some entertainment venues authorities have imposed conditions on a planning consent which requires that noise resulting from a proposed development is inaudible in adjacent noise sensitive premises. If inaudibility is considered appropriate, it is important to note that monitoring of such conditions may not be straightforward, and conditions should always meet the tests set out in [Circular 4/1998 Use of Conditions in Planning Permissions](#).

## LANDFILL OPERATIONS

35. NIAs should address noise from vehicular movements, frequency of deliveries, tipping operations, site plant, hours of operation and the provision of acoustic screening as they will have indirect effects on the amount of noise generated. PPC permit conditions can control noise in existing landfill sites that are operating with the benefit of a Certificate of Lawful Use or a planning permission that does not contain a noise condition. See also PAN 50 Annex A – Surface Mineral Working.

## ENFORCEMENT

36. Local authorities are legally obliged to investigate complaints of noise from premises, vehicles, machinery or equipment in the road, and have powers to take action against nuisance. This will be the most common route for formally addressing nuisance from noise. In relation to new development, it is preferable for anticipated noise impacts to be addressed at the outset through design and the use of mitigation measures. Planning authorities are encouraged to use planning conditions to ensure appropriate mitigation measures are put in place and maintained. Conditions attached to a consent should meet the six tests set out in [Circular 4/1998 Use of Conditions in Planning Permissions](#), particularly in terms of being enforceable. Planning authorities have powers to take enforcement action against any breach of planning control under the Town and Country Planning (Scotland) Act 1997, including a breach of the limitations or conditions specified in the General Permitted Development (Scotland) Order 1992. More information on planning enforcement is provided in [Circular 10/2009 Planning Enforcement](#).
37. Planning authorities may, where appropriate, specify in a condition that monitoring will be undertaken according to a scheme to be agreed between the planning authority and the developer. Monitoring methods which can be used include agreeing a number of noise control points where noise will be measured for monitoring purposes and the intervals at which the monitoring should be carried out. Electronic automatic monitoring devices can be accurate and cost effective for monitoring large scale developments that pose particularly acute noise issues. Problems may exist, however, in urban locations where other noise makes measurement difficult or where measured levels are only marginally above background noise.

## **FURTHER INFORMATION**

38. This Planning Advice Note and further information about the planning system can be found on the Scottish Government website at: <http://www.scotland.gov.uk/topics/built-environment>. For more information on this PAN please contact the Scottish Government on 0131 244 7888.





**The Scottish  
Government**

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