

# NOISE

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BULLETIN

## TRANSPORT NOISE

# M40 noise assessed . . . .

A residents group has polled 1,000 householders near the M40 in a bid to assess the impact of motorway noise. It supports a submission under the Sustainable Communities Act (see below)

The M40 Chiltern Environmental Group sent out volunteers to poll householders about noise. Findings are contained in a new report: "Over three-quarters of the respondents are frequently or nearly always subject to impact from M40 noise. Some 75% reported that they were affected in their bedrooms (and one in six reported sleep deprivation) and 80% to 90% in their gardens. A disturbing number (9%) recommend that people do not move to the area, or move away. This is a shocking indictment from people who live in an area of protected landscape, a designated area of outstanding natural beauty."

The report adds: "Responses validate many of the locations identified by Defra in maps for

the first round of locations to be treated for excessive noise. However, they challenge the recommendation of Defra's draft noise action plan that only locations exposed to levels of at least 76dBA should be treated.

"The responses indicate a much higher degree of annoyance than would be predicted from standard relationships between annoyance and noise intensity and support the findings of research elsewhere that standard relationships (used by Highways Agency) understate annoyance caused by noise in sensitive areas. They challenge the low priority assigned for noise mitigation by the Highways Agency to locations, for the most part, identified as excessively noisy by both Defra and the Highways Agency."



The Chiltern Group refer to recent research that suggests that relationships between annoyance and noise intensity determined under urban conditions are not valid for residents of rural communities, where similar levels of annoyance are reported at noise intensities at least 10dBA lower. "The Highways Agency determines priority for noise mitigation using a calculated Noise Severity Index (NSI) based on a relationship between 'propensity to complain' and noise intensity which makes no distinction between urban and rural environments. We believe the NSI calculation, which contains further sources of bias, inevitably assigns an erroneously low priority for action in rural areas."

● [www.m40-chilterns.org.uk](http://www.m40-chilterns.org.uk)

## ... and used as early case for new act

The M40 issues (see above) are being used to support an application to Government under the Sustainable Communities Act by Wycombe and South Oxfordshire councils. It is one of the first submissions under the act – almost certainly the first on noise.

A guide to the act explains: "The Sustainable Communities Act aims to promote the sustainability of local communities. It begins from the principle that local people know best what needs to be done to

promote the sustainability of their area, but that sometimes they need central government to act to enable them to do so.

"It provides a channel for local people to ask central government to take such action. It is also a new way for local authorities to ask central government to take action which they believe would better enable them to improve the economic, social or environmental well-being of their area. This could include a proposal to transfer the

functions of one public body to another.

"The scope of the Act is very broad, covering economic, social and environmental issues. It does not limit the type of action that could be put forward, provided the action is within that broad scope. It is for local people to decide what they think needs to be done to promote the sustainability of their area."

● [www.communities.gov.uk/publications/localgovernment/sustainablecommunitiesact](http://www.communities.gov.uk/publications/localgovernment/sustainablecommunitiesact)

## IN BRIEF

### Flawed planning?

Plans to deregulate planning laws for air conditioning units on commercial properties maybe flawed.

The DCLG is currently consulting on relaxation of planning rules for air conditioning units (as with ground source heat pumps). Air conditioning units can become a noise nuisance, and for as long as they are in the planning system, conditions can be imposed in a bid to reduce problems.

A Freedom of Information request to the DCLG challenged the department to state whether or not applying noise restrictions would be legal and practicable.

The questioner told *Noise Bulletin*: "I received a response that was not unexpected, but rather shocking. It appears as though DCLG has not thought to ask whether the proposed noise criteria for permitted development for air conditioning units are necessary, precise or enforceable. This being the case, how on earth does it expect the policy to be managed?"

● DCLG's consultation *Improving permitted development* can be viewed on [www.communities.gov.uk/publications/planningandbuilding/improvingdevelopmentconsultation](http://www.communities.gov.uk/publications/planningandbuilding/improvingdevelopmentconsultation)

### Transport leaflets

Epuk has produced a series of information leaflets, sponsored by Defra and the devolved regions. A copy is included with this newsletter.

It sets out the noise mapping and action planning process, and outlines mechanisms available for managing transport noise.

Epuk says there are three versions of the leaflet – for England, Scotland and Wales.

● Leaflets will also be available for download on [www.environmental-protection.org.uk](http://www.environmental-protection.org.uk)

## HIGHLIGHTS INSIDE...

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### 10 COMING EVENTS

- 10 SOUND BITES**  
Election fever, quiet exhausts, turbine failures and Porsche

**IN BRIEF**

**New man at Defra**

Former waste strategy guru Daniel Instone is joining Defra to look after environment issues, perhaps including noise.

Final details of his job description have yet to emerge but it is understood he has been brought in to bolster policy delivery.

**Tory 'too close'**

A Tory MP has claimed that some wind turbines are too close to people's homes.

Peter Luff said: "I believe there should be an absolute bar on building large commercial wind turbines closer than a kilometre to people's homes. These are effectively 40-storey high structures in open countryside – they must be a reasonable distance from homes.

"I support the development of some onshore wind generating capacity in England – but these enormous turbines in Worcestershire would be among the largest ever constructed at onshore sites in the UK. Indeed, I believe they were originally developed for offshore use and that is where they belong."

**ENFORCEMENT**

**Wording of notices: be specific**

A High Court judgement is likely to lead to changes in the wording of noise abatement notices.

York City Council has been fielding complaints from local residents complaining of excess noise from Elvington Airfield which hosts motor racing and other events. The High Court considered that City of York Council's use of the word "steps" in the noise abatement notice and the failure by the council to specify these steps made the notice defective or invalid.

In the court's opinion, the use of the word steps effectively

changed the notice from a "single barrelled" to a "double barrelled" notice. It did not consider that the information, contained within the letters sent with the notices, giving advice on how to reduce noise from the airfield was sufficient.

York City Council's Mike Southcombe told *Noise Bulletin*: "I was very disappointed by the court's decision. I have tried to reach an agreement with the airfield, but it now seems unlikely. We are already receiving complaints from local residents and are putting together a noise monitoring programme. If there is a

statutory noise nuisance, we will serve an abatement notice."

The High Court case arose following a long history of the council attempting to persuade Elvington Events Ltd that the noise was a nuisance. When negotiation failed, it served an abatement notice along with letter giving advice on how to reduce noise at the airfield.

The case went in and out of court with the airfield owner eventually insisting that York specify what it could and couldn't do. York said that it was not prepared to 'run the operation of the airfield' for them.

**AVIATION**

**Lobby group rapped on airport claim**

An advert claiming a third runway at Heathrow will not make the airport dirtier or noisier has been ruled "misleading" by the Advertising Standards Authority (ASA).

The advert had been placed in regional papers by pro-Heathrow expansion pressure group Future Heathrow and was published in the period before the Government's January 2009 decision to approve a third runway at the west London airport.

John McDonnell MP had challenged the noise, dirt and environmental claims made in the advert.

The ASA said readers of the advert would infer from the ad that a third runway would definitely not create more dirt or noise than the current levels at Heathrow without a third runway: "We considered that they would not expect it to mean that action would be taken on the noise and air levels, should independent assessors

notice a problem.

"We noted Future Heathrow and BAA firmly believed that the noise and air limits would not be breached, but considered that the evidence we had seen was not sufficient to justify an absolute claim that noise and pollution would not increase following the construction of a third runway. We concluded that the claim 'A third runway won't make Heathrow any noisier or dirtier' was likely to mislead."

**EDITORIAL COMMENT: ENGLISH ACTION PLANNING**

So Defra has done the rounds explaining what noise action plans will mean in practice. We covered these in detail in our last issue, Defra's presentation explained that it had done the mapping and decided on the priority areas – now it's down to local authorities.

At the events, pretty well every sentence was prefaced by the term 'in the context of sustainable development' and reassurances that there would be no new burdens were omnipresent.

If this was intended to please local authorities, we are not sure it hit the mark. Those that wanted nothing to do with the action plans simply didn't turn up, those that did turn up presumably did so because they had some interest in noise, here was Defra very clearly telling them they shouldn't get excited.

Defra is adamant that it is ahead of Scotland and Wales, both of whom have finished the identification of priority areas and quiet areas with the help of local authorities. And yet how much progress can be made in England if Bristol and Leeds are only just starting piloting the detail which other authorities will have to follow?

Once Defra had had its say, the meeting was closed for one-to-one discussions over tea and biscuits. A proper discussion did take place at the Institute of Acoustics meeting convened to prepare a response to the consultation. Aply chaired by

ERM's Steve Mitchell, it became clear that this meeting would not be hijacked by greenwash: "This is probably the most important consultation ever seen. You might doubt action plans will make any difference in the short term, but they are very important."

But he had reservations. He was concerned that night time noise and health effects had ended up in the "too difficult box". He agreed that the "in context of sustainable development" mantra was being applied too early in the process.

Other comments from the floor included:

- We always believed local authorities would have a central role in this, in the event we are non statutory consultees;
- There is overall timidity, and no aspiration in terms of health impacts.

Discussion moved to aircraft action plans: Points included:

- Some airports dismiss any responsibilities outside 55db – that is no good for deciding on quiet areas;
- Plans avoid the issue of sleep disturbance or impacts on schools;
- Most mention Anase then dismiss it;
- Most plans say noise is the responsibility of local authorities within agglomerations – and NATS outside agglomerations.

The loA is using the discussion to prepare its formal response. It may not make comfortable reading for Defra, *Noise Bulletin* will report it in full once it is finalised.

## AVIATION

## Overflowed boroughs revealed

Analysis by aircraft protest group Hacan confirms that Hounslow is the most 'overflowed' London borough – but east London boroughs also come high up the list.

Hacan says Waltham Forest is London's third most overflowed borough. Half of the top 12 boroughs are in east or SE London. Based on these figures, Hacan has formed an alliance with *Fight the Flights*, an East London campaign group which is fighting plans for a 50% increase in flights at City Airport.

Hacan chair John Stewart

said, "This survey shows very clearly that aircraft noise has become a London-wide problem. We expected Hounslow and Richmond to top the list but we were surprised that Waltham Forest and Newham were in third and fourth place respectively."

Anne-Marie Griffin of Fight the Flights said, "We are living under London's forgotten flight paths. Already the noise is intolerable in many areas. It will only get worse if City Airport is allowed to increase flights by 50%."

The Hacan survey did not

look at the heights of the aircraft. Stewart said, "If we had only counted planes that were say, over 8,000 feet, Croydon and probably Sutton would have dropped out of the top 12 to be replaced by Lewisham and one of the North London boroughs but the general picture would have remain largely unchanged."

Hacan has commissioned a study which will examine any operational changes that could be made which could ease the problem for people living in the boroughs many miles from Heathrow.

## Stansted residents complain of low planes

Stansted residents have complained about new take-off procedures that leave planes lower and noisier for longer. A new early morning flight is also causing particular annoyance.

A packed residents' meeting expressed anger at what is perceived as excess noise. There was also "widespread frustration" that BAA did not appear to hold data on noise levels prior to the change of practices and introduction of the early morning Asian flights which could have serve as a useful basis for comparison.

SSE's noise adviser Martin Peachey was concerned that while technically the airlines were operating within the rules, international flight procedures

for noise abatement require minimisation of noise exposure for those on the ground while maintaining safety and do not include reducing fuel costs. "While reduced fuel burn helps reduce emissions, it should not be done at the expense of causing increased noise levels over the very small segment of flight immediately after take-off where noise abatement is the key criteria," he said, reinforcing the need for early action to address the problems.

BAA's Andy Jefferson said the airport operator was working with the Noise and Track Keeping Working Group to resolve the situation. Amongst other things, BAA has agreed to introduce a mobile

noise monitor in Hatfield Heath to measure current noise levels and, from April 2010, it will also be trialling revised departure route arrangements within the approved noise preferential routes to overfly the fewest number of people possible.

Efforts are also being made to move the Air Asia X flight out of the core night period to before 11.30pm instead of 1.30am, and liaison with the Department for Transport will also be undertaken to explore the issue of the trade off between noise and emissions.

A follow up review will be undertaken with BAA promising feedback to the community on progress.

## Airport action plan data questioned

Stansted campaigners also claim that noise action plans contain incorrect data. They say Stansted's action plan draft fails to provide a common approach for the numbers of people and dwellings affected by aircraft.

Stop Stansted Expansion campaigners say: "BAA's draft noise action plan for Stansted Airport states that it provides the results of the 2006 noise mapping and this is one of the primary information sources for its proposals. In fact, the estimated numbers of affected people and dwellings given in the Stansted draft action plan are not the results of the 2006 noise mapping at all and we are

concerned at the misrepresentation of the real picture by BAA in its consultation."

They say the noise mapping, together with figures for affected people and dwellings, was carried out by the CAA and published in December 2007. Meanwhile figures for affected people and dwellings given in BAA's draft action plan were apparently provided by Defra and differ because the CAA figures were all published in 5dB contour bands for the five different noise indices in compliance with the noise directive. Defra provided its figures as cumulative totals in

steps of 3dB for four out of the five different noise indices.

Campaigners add: "The significance of this is that it is impossible to reconcile four out of the five sets of Defra figures given in BAA's draft action plan with the CAA figures that should have been used. In the only case where it is possible to reconcile these two different sets of figures, the Defra figures understate the affected population and dwellings by 600 (6%) and 350 (8%) respectively. It is impossible to know what the discrepancies are for the other four sets of noise indices."

• More on action plans: see p6

## IN BRIEF

### Euronoise nears

The huge Euronoise conference in Edinburgh is looming.

Organisers have now finalised the programme that will see hundreds of speakers and several hundred delegates converge on Edinburgh to talk about noise.

The conference, organised by the IoA and Bernard Berry, runs from 26th-28th October.

• [www.euronoise2009.org.uk](http://www.euronoise2009.org.uk)

### Film evidence?

The campaign group Hacan has released a short film which aims to show that aircraft noise is not confined to West London and the areas around Heathrow.

The short film, shot in Vauxhall, over 16 miles from the airport, revealed that a plane goes over the area about once every two minutes. The film claims to challenge the view of BAA and Department for Transport that aircraft noise is not a problem in areas this far from Heathrow.

• [www.youtube.com/watch?v=rXf8o\\_khz8s](http://www.youtube.com/watch?v=rXf8o_khz8s) -

### Planning Act rules

A number of guidance documents have been published as part of the 2008 Planning Act shake up.

The Act introduces the Infrastructure Planning Commission which will in future decide on large infrastructure projects such as wind turbines. Included in the current batch of advice is guidance for developers on what matters must be consulted upon before finalising an application, and the shape of the consultation. In the past developers have been encouraged but not obliged to consult early.

Now they must consult among interested groups including local authorities.

• Planning Act 2008: Guidance on pre-application consultation and other guidance [www.communities.gov.uk/planningandbuilding/planning/planningpolicy/implementation/reform/planningsystem/planningbill/](http://www.communities.gov.uk/planningandbuilding/planning/planningpolicy/implementation/reform/planningsystem/planningbill/)

IN BRIEF

**Heathrow in court**

A group of councils opposed to Heathrow expansion have been given leave to challenge the Government's decision to support a third runway at Heathrow.

Councils in the 2M group will argue that ministers used flawed and erroneous evidence to support their decision to approve the third runway. The hearing is not expected before November.

**Immune system effects from noise**

*Noise and Health Journal* reports that noise-induced stress could increase the likelihood of illness by weakening the immune system.

Cortisol is a hormone that is involved in the body's response to stress and anxiety, it increases blood pressure and blood sugar, and reduces the ability of the immune system to respond to disease or injury. Previous research indicates that both ongoing and temporary exposure to noise can increase cortisol levels.

As cortisol levels can be easily detected in saliva, the study suggests that this could be a simple and cost-effective measure for analysing stress in response to noise.

However, the relationship between the amount of exposure to noise and cortisol levels is not as simple as may first appear. There is a natural cycle to cortisol levels in the body, with levels dropping at night-time. This can also be disturbed by noise, so that the natural decrease does not occur, causing prolonged stress during the night.

This means that exposure to day-time noise could also contribute to sleep-disturbance through its after-effects; it may not be just night-time noise that affects sleep.

**Is there evidence that environmental noise is immunotoxic, Deepak Prasher (2009)?** *Noise & Health*. 11(4): 151-155.

**ROAD NOISE**

**Dramatic cuts from new surface**

The London Borough of Hillingdon has witnessed dramatic noise reductions following resurfacing of the A40 in West London.

Worn hot rolled asphalt (HRA) was replaced on the northbound carriageway of Oxford Road, Uxbridge. It was resurfaced with a textured thin asphalt material designed to minimise road/tyre noise. The material has a "high speed" road surface index (relative to HRA) of -5.5 dBA.

Hillingdon's Mike Rickaby told *Noise Bulletin*: "A residents' perception questionnaire was sent to 60 neighbouring properties situated at up to 70m from the road. Of 25 replies received, 18 reported reduced road traffic noise levels following road resurfacing, and seven reported no change.

"Noise levels were measured two days before resurfacing and two days after resurfacing. Traffic counts, HGV percentages and weather observations were recorded. The roads were dry and traffic free flowing. Measured average LA<sub>eq 3hr</sub> and LA<sub>10 1hr</sub> were 76.9 and 81.0dB before resurfacing and 70.4 and

73.4dB after resurfacing, giving reductions of 6.5 and 7.5dB respectively.

"The quoted noise reduction of 5.5dB would not be expected to be achieved at the resurfaced road which has a 30 mph limit (as engine noise predominates over road/tyre noise at low speeds, and measured noise levels would include contributions from other sources). The measured noise reductions were therefore considered very large."



There was no evidence that wind conditions had caused the measured noise reductions. Traffic counts and HGV percentages also did not explain the drop.

Rickaby continued: "Resurfacing with low noise material is known to give large noise reductions if the surface being replaced is rough and irregular, as were parts of the road surface. Were reductions in suspension noise, and load and body rattle, adding to reductions

in road/tyre noise? Were there other contributory factors? Has road/tyre noise become more important relative to engine noise at low speeds? Did traffic slow on the new road surface?

"This seems an unlikely explanation because similar noise levels were measured in the supplementary monitoring carried out several months after the main post-surfacing monitoring. No explanation has been found for the very large noise reductions other than the benefits, by whatever mechanism, of the low noise material relative to the worn HRA.

● email MRickaby@Hillingdon.Gov.UK

**MONITORING**

**Norsonic helps 'no-nonsense' Preston**

Award winning Preston City Council has found that zero tolerance towards noise related anti-social behaviour has led to a reduction in noise complaints, seizures and prosecutions.

A 20% reduction in demand from the local public for assistance to deal with noisy neighbours is claimed to be a direct result of Preston City Council's robust approach to noise enforcement.

The Norsonic noise nuisance equipment has been regularly used to record intermittent noise disturbances such as dogs barking, impact noise and loud music or where the disturbance occurs outside the hours covered by the night noise service.

Norsonic instrumentation can

provide both audio and video evidence to support the service of an abatement notice. Failure to comply can lead to confiscation – five years of this approach has seen a reported drop of 65% in seizures and a 77% reduction in noise

prosecutions.

Preston's Chris Hodson says the Norsonic equipment has underpinned the 'get tough' approach.

● Campell Associates is the Norsonic agent in the UK www.campbell-associates.co.uk



Preston's pickings resulting from its get tough approach

## COURTS

## Hunt: We will not change ETSU

Epuk's plea to the Government for a review of Etsu guidance on wind turbines has been bluntly rejected.

Big turbines are not noisy, the Government says, and amplitude modulation (thumping) is not a problem.

ETSU-R-97 guidance was published in 1996 as the findings of the Working Group on Wind Turbine Noise. It is used to assess the noise impact of wind turbines, but is increasingly being criticised as being unfit for purpose and unable to cope with much larger modern turbines.

Epuk wrote in a letter to Decc minister Lord Hunt: "The UK Renewable Energy Strategy is looking for around a fivefold increase in onshore wind capacity by 2020. The siting of

this capacity in a heavily populated country is already presenting challenges – the latest of these being a private nuisance action by homeowners in Lincolnshire (with previous refusals on appeal of applications in Norfolk and Kent) on noise grounds.

"With the Planning Act 2008 effectively giving developers of major installations immunity from nuisance, we believe urgent revision of this guidance will go a long way to safeguarding the quality of life of future wind farm neighbours, thus avoiding the expense (to all concerned) of investigative and legal procedures should appeals and/or problems arise."

Epuk's other points include:

- Drafted in the light of 'the best information available at the

time', the report acknowledges that revision may be necessary – Etsu itself recommended it be reviewed in two years' time. It is now 13 years old.

- Since the production of the guidance, turbine height and blade sizes have increased significantly, altering potential acoustic effects.

Lord Hunt's curt reply to Epuk argues that there is "no evidence to suggest that larger turbines are any more likely to cause a noise impact than earlier and smaller designs".

"Similarly there is no evidence to suggest that the small incidence of amplitude modulation that is reported to occur at a few sites is as a result of turbine size." Hunt says the government will continue to support the use of Etsu.

## HEALTH EFFECTS

## Epuk responds on noise and health report

Epuk has put together a scathing response to the Health Protection Agency's report on noise and health (*Noise Bulletin Aug/Sep p8*).

It says: "We find the nearest thing to a helpful conclusion in this report is the acknowledgement that there should be a move towards expressing noise impacts in terms of probabilities of occurrence of a specified effect at a specified level of exposure."

"Given the requirements of the Environmental Noise Directive, a proper application of the precautionary principle would include moving from guidelines to standards and targets to afford some health

protection from environmental noise can be set now, drawing on the existing body of knowledge, as has been done for air quality for many years.

"The report gives no help to policy makers tasked by the Environmental Noise Directive, with working to 'to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise'. Eighteen recommendations for research are listed – not all of these are directly related (if at all) to health impacts

"The executive summary lists 17 conclusions. A handful of these directly relate to health impacts. For realistic progress

to be made, policy makers need to know where to start."

Other comments include:

- We find the comment on the need for simplification of regulation of environmental noise rather odd as the report mainly covers transport noise where regulatory responsibility is clear (as a result of the Environmental Noise Directive);
- With the HPA stating that 10% of the UK population is exposed to daytime noise above 65dB, and noise action planning in its infancy, establishment of a noise expert group is fairly fundamental (there are at least two on air quality), to establish coherent and consistent advice as the process).

## HEALTH EFFECTS

## Noisy roads cause stress

Noisy roads tend to cause stress among the middle aged, Swedish researchers suggest.

Public health data on nearly 30,000 adults aged 18-80 was studied. Self reported incidence of hypertension (stress) was compared to GIS-inferred noise levels at the residential address.

Researchers found a 10% increased likelihood of stress in intermediate exposure

categories (45-64dBA) with no obvious trend, but for noise above 64dBA there was a 45% increase in risk. The risk levels became more pronounced for the middle aged.

Researchers conclude: "The study supports an association between road traffic noise at high average levels and self-reported hypertension in middle-aged. Future studies

should use age group-specific relative effect models to account for differences in prevalence."

**Road traffic noise and hypertension: results from a cross-sectional public health survey in southern Sweden, Theo Bodin et al, *Environmental Health*, [www.ehjournal.net/content/8/1/38](http://www.ehjournal.net/content/8/1/38)**

## IN BRIEF

### Beaks' sentencing

A revised version of the Magistrates' guidance *Costing the Earth* has been released.

*Costing the Earth* was first published in 2002 by the Magistrates' Association in recognition of the increasing number and importance of these cases and lack of any available guidance. While essentially prepared to help sentencers and their legal advisers, other organisations have found the guidance informative and helpful in preparation of cases.

"The offences are serious and magistrates are keen to play their part in effective punishment and deterrence. As magistrates deal with relatively few such offences, this guidance will be of great assistance to the courts in arriving at sentences that are just and appropriate."

It was written by Paul Stookes of Richard Buxton.

- [www.magistrates-association.org.uk/Earth](http://www.magistrates-association.org.uk/Earth).

### Nuisance on the rise

Reports of neighbour disturbance have risen by a third in two years, reversing 10 years of improving relations.

According to a study from Halifax Home Insurance, one in five (17%) homeowners has experienced serious problems with neighbours this year, a peak last seen in 1997.

Halifax says 300,000 more tenants have been created since the recession began, many of them on casual or short-term leases. As a result, areas of high rental density experience spikes in neighbour complaints, many of which are excessive noise.

### BB takes PB

UK construction group Balfour Beatty has taken over US-based consultant Parsons Brinckerhoff. Balfour Beatty paid \$626 million for the firm. Balfour Beatty has agreed that Parsons Brinckerhoff will retain its name and organisational structure and operate as an independent but wholly-owned subsidiary.

# Aviation action plans trickle out

Airport action plans are slowly being released for consultation by the respective airports finds Lis Stedman

**A**irport draft noise action plans (NAPs), being the first definitive plans to be published in England at least, were bound to come under intense scrutiny. But how do they stack up against expectations?

The initial response from a number of sources, unfortunately, is that many are essentially noise inaction plans – the message appearing to be that most airports consider they are doing a great job and that therefore what they need to do is more of the same. The words “continue to” crop up an uncomfortable number of times in most plans.

This perhaps is not a surprise given that airports are their own ‘competent authority’. The consultation is also, confusingly, a two-department issue, with Defra acting as lead department for the draft NAPs and DFT providing input – it will “form a view” about whether the NAPs meet requirements, and will recommend (or not) adoption.

But is this approach wrong? ERM’s Steve Mitchell (who is preparing the IoA’s response and spoke on the NAPs at a recent workshop) says that most airports have broadly followed the Defra guidance and provided “quite a comprehensive account of what they’ve been doing on noise” although he urges Defra to check for omissions carefully.

Mitchell also notes: “If you look at the cost side of things, airports really are rather active in noise management despite decentralisation and deregulation. Some of the figures are quite large.” Heathrow, for instance, highlights an £8 million per year onward spend on noise insulation and the top five airports in the UK are spending over £250,000 a year on noise-related issues. Mitchell notes: “If you contrast that with what is happening on road traffic noise and other action plans, this is quite big. The big four or five airports have been managing noise quite carefully, they have been spending and will continue to spend large amounts on quantifying and managing noise despite the fact the government is not putting on any pressure. It is local planning agreements and local pressure that have done that, which suggests it has worked quite well.”

A glance through the NAPs shows certain patterns – the BAA airports in England (Heathrow, Gatwick and Stansted) clearly share a template, with some segments individualised as required. Likewise BAA’s Scottish airports (Edinburgh, Glasgow and Aberdeen) share some similarities with their English cousins but more strongly with each other. Southampton’s, though also a BAA airport, appears to be a separate

effort as does Bournemouth’s (part of the Manchester group).

The design, approach, readability and amount of detail in the NAPs vary considerably. Some (mainly BAA’s) are formidable and formal documents, 60 to 80 pages long, while others (such as Luton’s and Newcastle’s) barely reach the mid-20 page length. Some (particularly Birmingham’s and Luton’s) are extremely readable and accessible, while others throw jargon carelessly at the readership.

Getting the airports to justify or explain their NAPs beyond the limited information available within the plans themselves is, oddly, a huge challenge. Some airport websites and phone lines seem designed to avoid queries other than basic responses about flight times and car park charges, and when the inquirer finally slashes their way through the mire to the correct department more often than not the only option is to leave a voicemail that is not responded to.

Birmingham Airport proved a welcome exception. Environment manager Ben Hanley explains that he produced the airport draft NAP with a colleague in-house. He notes: “We have got a lot of experience in dealing with the community, and we wanted something that could be understood. There is a danger if you go external that you lose the sense of the sentiment locally. Noise is not something that lends itself to be easily interpreted, and we wanted something that could be understood.”

He adds that the process was particularly challenging for Birmingham because the airport also had a major planning application for a runway extension running under its master plan process (as set out in the *Future of Air Transport* white paper), which requires airports to identify where expansion and growth should occur. Originally Birmingham was scheduled to have a second runway but instead opted for a runway extension. “For most airports, noise is a major element of the master plan,” he explains.

This process and the amendments needed to the airport’s Section 106 agreement with Solihull MBC helped, he notes, as the actions the airport agreed to included tighter noise restrictions – the consultation for this ran in parallel with the development of the draft NAP, which meant there was a need to ensure that there wasn’t confusing crossover. “There is a danger when people are being consulted that they don’t know what they are being consulted on,” he notes. Birmingham also consulted extensively with its local councils and other stakeholders in developing its draft.

Birmingham’s NAP is among the most readable, but like the others suffers from having to be created ahead of the designation of quiet areas in the first round agglomerations. The NAP does briefly mention this, and Hanley notes that “all we can do is to commit to work with the relevant authorities to deal with this. You can’t deal with it effectively in the first document, but by making the commitment we are committed to do something”.

He speculates that aviation is often singled out for early action “because it is quite proactive already. Most noise control is good, and we have experience in dealing with noise issues.”

Birmingham had the most extensive consultation, with 12 public meetings (one daytime, one evening) at six different locations. The meetings were widely advertised, but Hanley says they have had “varied success – some have been better attended than others but they have been useful in gauging sentiment and local issues. We do a lot of work, but it is good to meet face to face to discuss issues.” Birmingham airport, having been part of the BUMP noise mapping group, has had useful contact with its local authorities for some time and therefore a good idea of the issues, he adds.

Apart from Birmingham, airports may be keeping their thoughts about their NAPs to themselves – but their critics are not. South Derbyshire MP Mark Todd has sent a letter to East Midlands Airport voicing a number of criticisms including the obvious flaw that accountability of the decision-makers is to their board and shareholders, and those who object can be heard but they have no means of making the decision-makers accountable.

Another key criticism (which is levelled at many other airports) is that the draft essentially endorses the supposedly stringent noise controls set out in the airports’ master plans. Todd points out that this uses the 1996 base point for noise disturbance and repeats the obligation to maintain contours for 2016 within that shape. This uses the noisiest year of East Midlands’ activity as a base (though for at least one airport this year was unusually quiet due to runway alterations). The benefit of technological change in aircraft fleets is not used to benefit residents through the period of this plan, Todd adds.

He also says that night noise is the major issue at East Midlands, and that the generally accepted night noise level in the UK is 48dB. His letter continues: “Close scrutiny of the paragraph relating to planning confirms this. However

everywhere else in the document 57dB is used. The night contour utilised should be 48dB.”

Mitchell confirms the problematic issue of night noise, noting that some airports have been “economical” in providing the data for 55dBA but not for 50dBA as stipulated in the guidelines, which would undoubtedly mean significantly larger numbers affected. “Stopping at 55dB doesn’t give the full picture,” he adds.

Roger Wood of Luton pressure group LADACAN is also concerned about a lack of night noise action. He styles the airport’s NAP “a triumph of presentation over content, with almost nothing on real action on noise or anything that will improve the noise environment round the airport”. He adds that with night noise “the indication is that there has been a steady increase, though we were told it would stop getting worse”. He also says aircraft are increasingly overflying urban areas that they are supposed to avoid, but that “reasonable” targets put forward by the group for inclusion in the draft NAP were ignored. “Complacency is the dominant theme in all the action plans I’ve seen,” he adds.

Other observers have voiced concern that the NAPs fail to meet the spirit of the environmental noise directive, mainly outlining actions that they are already undertaking or that were already inked in for master plans. Some NAPs are also slightly wobbly on Defra’s 12 must-include points, and other instructions in the guidance such as the need to consider conflicts with quiet areas and to aim to preserve them, and ‘where possible’ to avoid overflights of national parks and areas of outstanding natural beauty.

Only four plans (ironically East Midlands, Bournemouth, Southampton and London City) even mention the latter, despite the fact that Gatwick is sitting virtually on top of two critical sites – the new South Downs national park and the High Weald area of outstanding natural beauty. Bournemouth, some of whose flights overfly the New Forest national park, provides only a rather woolly commitment to “continue to explore ways of joint working [with the National Park Authority] to minimise impacts”. Southampton Airport, from where flights overfly the same park, has a mention in its plan of the requirement to protect such areas where possible by avoiding overflights, but no more.

The draft actions plans for Gatwick and Heathrow have been analysed by their respective campaign groups, whose views mirror the Aviation Environment Federation criticisms. In particular, they point out that there is no estimate of the effect of proposed actions, no evidence that the plan

will reduce noise levels, and that any targets, actions and results to be set and monitored by the airport, that is, that there is no independent scrutiny. They also highlight the lack of protection for national parks and of any new initiatives as outlined above. However, this criticism needs to be tempered by Mitchell’s observation that Heathrow’s approach to noise management “is right up there with the best”.

There is a certain amount of obfuscation, though, with NAP process details sometimes curiously lacking: for instance only Luton mentions the recent major NATS airspace redesign, intended to streamline flightpaths, and which impacts on noise issues. Mitchell also notes that he had hoped the NAPs could be used to benchmark the airports but “in practice the nuances behind what they say mean you can’t tell what they are doing or committing to doing”.

Two plans have also been incredibly tardy – London City Airport and London Luton have only just been published and have consultation deadlines in mid-January. Given that consultation responses are due back with Defra on 28th November, it would be good to know what the airports plan to do to resolve this issue but despite repeated attempts to contact them there has been a deafening silence. And unbelievably, Leeds Bradford airport has not yet produced a plan – a representative explained that the NAP required signoff from the airport’s operations director, who was on holiday. Further attempts to communicate have failed.

Cait Weston of the AEF has a more basic worry, which goes back to the premises behind the plans: “We have always argued that the requirement in the Environment Noise Regulations for the Secretary of State to set limit values was an essential part of this legislation that had not been fulfilled. Then the government proposed removing the requirement.

“We had a partial win on this, as when the final version of the amended regulations came out they had in fact retained the requirement to set limit values, but commentary from Defra to the consultation responses indicated that they considered they had already done it! We can only imagine that they are referring to the suggestion that homes exposed to more than 69L<sub>eq</sub> should be given special consideration, but vague commitments in L<sub>eq</sub> metrics are not relevant to a piece of legislation in which L<sub>den</sub> and L<sub>night</sub> are the agreed metrics.”

It has to be said that the NAPs have their good points. Manchester’s plan is comprehensive and frank and has useful diagrams. Blackpool has an excellent layman’s description of what a decibel is, and other noise terms. London City has a

very good summary of the strategic noise mapping process.

And Mitchell points out one considerable bonus from the process, that the regulations have forced airports to publish full eight hour night noise data, for which some had either chosen to publish six-hour data with less impact, omitted or not highlighted.

But the doubts remain. Hacan Clearskies’ John Stewart sums up one of the critical issues: “I understand that we are the only country in Europe where the government has asked the airports to draw up the action plans for airports. When that is done, you are not going to expect very much. They are not going to do very much more than they were going to – there are a few small measures to improve the situation, maybe a bit of mitigation, nothing else.” His conclusion on the plans is that they are a “huge missed opportunity”.

SASIG, a group of around 50 local authorities from across the country with an interest in strategic aviation issues, noted in its response to the consultation on Defra’s guidance document that “overall it is difficult to envisage that most airport operators, who have been addressing noise mitigation for many years, are likely to come up with anything new in their noise action plan if it merely follows the draft guidance. Considerable strengthening of the guidance is needed by setting more specific criteria and limit values. As presently written it appears that the draft guidance has more the flavour of the Department for Transport, and does not represent truly cross-departmental work.”

This message reflects the reality of the NAPs. One key observation is that the plans are almost irrelevant (in most cases) because of the earlier work for the airports’ master plans – generally, the NAPs can be seen as mirrors of master plan actions. Is this what the END intended? It seems unlikely. Bearing in mind the caveat that airports are generally creditably advanced in terms of noise management, quantification and reporting, it is still fundamentally wrong for airport operators, with their commercial imperatives, to act as both poacher and gamekeeper and their NAPs, by and large, prove this.

One west London authority noted that Heathrow said it’s online consultation response would take no more than 15 minutes. Comments were limited in length because of the size of the online comments box: “This may be okay for the public, but woefully inappropriate for an in depth technical response,” said the borough.

## Weblinks

Weblinks for the action plans will be posted on our website [www.noise-bulletin.org.uk](http://www.noise-bulletin.org.uk)

# When the wind blows

A major conference on wind turbine noise covered a wide range of issues including propagation mechanisms, prediction and measurement. Lisa Russell reports

Leading practitioners in the field of wind turbine noise get together every two years to discuss the latest advances in the field, most recently in June at Aalborg, Denmark.

The complexity and range of the noise issues is emphasised by the extensive range of almost 50 papers from around the world presented at this, the third international meeting on wind turbine noise. The papers covered general and technical topics on all aspects, theoretical and practical.

Complaints about noise are not confined to large wind farms. Noise consultant Carlo Di Napoli of Pöyry Energy Oy discussed a site he investigated near a small community in the west of Finland. There is just one pitch-regulated 1MW wind turbine, with the closest residence being a holiday cottage 750m away. The modern wind turbine has a potential for many types of noises, he concluded. The tower and its support may create a potential for low frequency structure-borne sounds especially in higher winds. "Right after the first equipment tests and after the start of the first official test, the prevailing wind speed accelerated to a level over 10 m/s at the nacelle height. To my surprise, the turbine tower started to resonate with a frequency of about 40 Hz," he said. "A loud and low 'rumble' structure-borne sound started to emit from the turbine."

In addition, a pulse of amplitude-modulated (AM) sound was found in all wind conditions, even where sound pressure level of the turbine was close to background. During one recording session of just three minutes, the AM sound level changed 12dB (bottom to top) for a wind speed change of 5m/s.

A New Zealand case study discussed another mechanism: possible seismic effects from turbines. Residents at a river plain at the foot of the Tararua Ranges experience ongoing noise problems that are thought to emanate from a nearby wind farm, where the closest turbine is 3km away. The question is not whether turbines actually generate seismic energy, but whether this signal can be significant for nearby residents, says the paper by Bakker et al.

The turbines are well coupled into the mechanically-competent 'old' rocks. Energy will then propagate outwards and meet the unconsolidated sedimentary rocks and sediments at the residential location.

Events were characterised by bursts of around 10 seconds duration and with broad

peaks in the power spectra at 28Hz and 10Hz. The study concluded that there were two parts to the nuisance noise: an acoustic wave modulated in amplitude, and possibly frequency, and a seismic wave that is 'perceivable' within the residence creating sleep disturbance.

There is increased interest in the influence on noise of wind shear – the gradient of wind speed going up through the atmosphere – and the topic was discussed at the conference.

There are three reasons why wind shear is of interest, said Dick Bowdler in his paper on wind shear and its effect on noise assessment. The first is that it has an influence on the way sound is propagated from the wind turbine to the neighbouring housing. This is generally dealt with by calculating the "worst case" – the most efficient propagation method. The second reason is that turbine sound power levels are referenced to the 10m wind speed using a fixed wind shear, in link with IEC 61400-11's method of measurement.

"As Fritz van den Berg pointed out in 2003, increasing wind shear results in increasing sound power level output of the turbine for the same 10m wind speed – and so the sound level may be higher than expected," said Bowdler. The third reason is that there is some evidence that increased wind shear across the face of the turbine results in increased amplitude modulation, which may be perceived as exacerbating the noise.

Bowdler also introduced the term 'twist'. "It is not only wind speed that changes with height but wind direction. Meteorologists appear to call the variation of wind direction with height "shear" in the same way as the variation of speed with height. I have called it 'twist' to distinguish the two. It seems unlikely that twist will make a significant difference to sound power output, though it may make a difference to the sound characteristics of the turbine in that increased amplitude modulation may take place where the wind direction at the top of the trajectory is significantly different from that at the bottom."

The cyclic 'whoosh' created by wind turbines are their most recognisable audible feature, often reported as their most annoying aspect, said William Palmer in his paper, *A new explanation for wind turbine whoosh – wind shear*. "This paper attempts to provide an explanation to the quandary that is probably one of the greatest

mysteries about wind turbines – why they are not noisy to the person who stands under them in the daytime, and yet are unwelcome noisy intruders at night for the resident who lives near them," he said.

He explained that daytime hours typically have a neutral atmosphere with a shear of 0.14 and no stable layer. The wind speed is roughly the same from the top to the bottom of the turbine rotor (varying less than 10% from the top to the bottom of the blade circle.) However, in the stable atmosphere of most nights, the variation of incident wind speed across the turbine rotor varies significantly, ranging from 33% to over 100%.

He said that the cyclic whoosh of wind turbines can be described by the movement of the blades through high wind speeds at the top to low speeds at the bottom of the blade rotation. The stable atmosphere at night creates the greatest change in the summed 'angle of attack' considering the contribution of each blade taken together, as heard by an observer. The whoosh becomes more apparent.

It has been said that most of the noise is produced by the outer part of the blades on the downward motion, but Palmer did not find this, once he took the speed of sound into account. The loudest sound, the 'whoosh' occurred about the 4 o'clock position but this meant that the sound was actually generated 0.3 of a revolution earlier, as the blade was just passing the top of its path.

"This knowledge might be used to reduce the annoying cyclic whoosh of wind turbines by a cyclical pitch of the blades as they reach the top of their rotation. This would also decrease stresses on the blades caused by flexure, and might even reduce blade failure probability."

A team of five from Seoul National University looked at a method of estimating wind turbine noise's amplitude modulation – the swishing characteristic – in order to assess community response. Previous field study work has showed that verbal descriptions that imply periodic sound fluctuation such as swishing, whistling and pulsating were highly correlated to noise annoyance, they said. The study aimed to determine a simple and robust method of quantifying the amplitude modulation. "By applying the double fast Fourier transform to wind turbine noise, the modulation factor at each frequency band can be obtained from a simple formula," they said. "It may

not be a precise measurement method, but the formula gives a good approximation to the amplitude modulation in the wind turbine noise.”

A paper by Stefan Oerlemans and Gerard Schepers of the Netherlands discussed noise directivity and swish. “For the design of quiet wind turbines, and for the planning of wind farms, the availability of fast and accurate noise prediction methods is essential,” they said. The paper described the application of a semi-empirical trailing edge noise prediction method to calculate wind turbine noise. It predicted the turbine noise directivity within 1-2 dB, and the swish amplitude in different directions within 1dB. Noise footprints were calculated. “These footprints show that for cross-wind directions the average level is lower than in the up- and downwind directions, but the variation in level is larger. Even at large distance, swish amplitudes up to 5dB can be expected for cross-wind directions.”

Advances in methods of analysis include implementation of the Nord2000 model, which has created a host of possibilities for examining situations that were previously too complex for calculation, said a paper from EMD International. Nord2000 opens up the possibility to calculate average noise levels, uncertainty of the noise level and different probability levels for almost any combination of wind speed and time frame, as well as the propagation effect of varying weather conditions and complex terrain, they said.

One of the topics covered in papers was the use of the Noise Perception Index (NPI) for setting wind farm noise limits to protect communities. Malcolm Hunt and Lindsay Hannah of Malcolm Hunt Associates in New Zealand explained that NPI is a newly-emerging noise assessment tool based on the degree to which pre-existing ambient background sound levels are exceeded by the sound under investigation.

If the overall NPI indicator value for a receiver site exceeds NPI 5, NPI can guide on the decibel amount by which the limit should be reduced during quiet periods to provide adequate community protection.

Disagreements can arise about the methods of taking measurements and a paper by David Hessler discussed the results of wind tunnel testing of microphone windscreen performance. It

looked at the effect of airflow penetrating the wind shields of microphones, creating false signal noise. “Measurements made under moderately windy conditions – a virtual necessity for wind turbine analyses – will exhibit erroneously high levels of low frequency noise, which may be one of the principal reasons wind turbines are widely, but mistakenly believed to produce substantial levels of low frequency and infrasonic sound,” he said. A-weighted sound levels are generally immune from any significant degradation in accuracy as long as an extra-large wind shield on the order of 175mm in diameter is used and the wind speed at the microphone position is below about 5m/s. Conventional wind shields in the 75 to 90mm size range are much less effective and prone to significantly greater error in measuring both A- and C-weighted sound levels in the presence of airflow, he warns.

The conference gave the opportunity to hear how wind turbine noise is being tackled in different places, including use in New Zealand of a 19-minute DVD to explain the complex issue to the public and the Netherlands’ new national noise map. Preliminary results were presented of a study in which the national noise map of all wind turbines in the Netherlands was used for impact assessment, said a paper by Jan Jabben, Edwin Verheijen and Eric Schreurs of RIVM. If a limit value of  $L_{den}$  40 dBA is chosen for the Netherlands, approximately 5% of the country – some 1,800 sq km – would be available for new turbines. At a limit value of 45dBA this increases to 19% (4,320 sq km) and at  $L_{den}$  50dBA, 13.680 sq km would be available.

A limit value of  $L_{den}$  40dBA could meet a target land wind turbine power yield of 2GW in 2011, but a higher limit value of  $L_{den}$  45 dBA would be required to accommodate a target of 6GW for 2020.

In terms of annoyance and health effects, “from this study it seems preferable that new turbines do not exceed a limit value of  $L_{den}$  40 dBA. This would pose restrictions with regard to the options for new wind parks and finding new locations on land could prove much harder than in the past,” said the paper.

There was also discussion of the difficulties of analysing data for proposed wind farms. “At the moment it is difficult to compare turbine noise data as specified in manufacturers’ documents on a like-for-

like basis because the methods for deriving the input data are not comparable,” said Sylvia Broneske of Hayes McKenzie Partnership.

Conservative approaches to the prediction of noise immissions from wind farms reduce the risk of compliance failure, said a paper by Andrew Bullmore, Justin Adcock, Mark Jiggins, Matthew Cand of Hoare Lea.

However, overly conservative approaches introduce the risk of not capturing the true energy-generating capacity of a given wind farm site. “The large scale of modern wind farms means that seemingly small conservatism in the prediction of noise immission levels can translate to substantial lost development opportunities.”

Understanding the nature of the many factors is vitally important for designers and developers alike if they are to make truly informed selections of their noise prediction methodologies and the relevant input parameters, they said.

The IEC 61400-11 measurement method is under revision at the moment and the new edition 3 is expected to be finished in 2010. While the basic measurement setup is almost unchanged, significant changes are introduced in the data analysis, as Delta’s Bo Søndergaard explained. “The analysis is heavier but manageable in a standard spreadsheet. It is more general and hopefully it is able to meet the demands when new types of wind turbines are developed. The benefit is that the results are more reliable and the uncertainties on the results are calculated more than estimated.”

If noise is inevitable, there may be ways of disguising it. Karl Bolin and Mats Nilsson of Sweden have looked at the influence of natural ambient sounds on perceived wind turbine noise. “The main message of the present study was that masking of wind turbine noise by using positive natural sounds may be a useful soundscape design tool,” they said. “The perceived loudness of a given wind turbine level may vary considerably due to complete or partial masking by natural sound sources.”

## Weblinks

Proceedings of the conference and further information can be found on [www.windturbine2009.org](http://www.windturbine2009.org)

The election nears and the big question is, will the Tories retain their pledge to junk plans for a third runway at Heathrow?

With a change of Government likely, the pledge is significant – however protesters should not count their chickens.

The Tories have already ditched their promise to get rid of the Infrastructure Planning Commission. Many fear the new Planning Act 2008 regime will trample over local nuisance rights and the Tories' pledge to abolish it was welcomed. Until they changed their mind.

And of course when Labour entered Government back in 1997, it came to power with a pledge for a moratorium on new road building. That was lifted within months once Big Business read the Government its fortune. And so it will be with the third runway.

So Windsave's domestic turbine division has gone bust.

This is not a moment for gloating, jobs, hopes, aspirations and a whole lot of goodwill has been dashed, and no doubt there will be money owed. However it does serve as a salutary warning about the dangers of overselling a technology.

This magazine has been highly

sceptical for some years that the benefits of domestic turbines outweigh the danger that they will cause a noise nuisance. Long after the evidence was there to see, the microwind lobby were arrogantly dismissive of the downsides.

As recently as the last issue we said there was a certain karma in the Energy Savings Trust's analysis of the technology. With Windsave's demise, we now hope that the vision of a future with windmills screwed to the walls of terraced houses is firmly shattered.

For those into air quality, it will be interesting to see whether the massive push for domestic wood fired biomass heating hits a similar brick wall, given the practical problems with burning wood in city centres.

York City Council's spat with Elvington Airfield sounds bad enough, but of course it appears that it is the residents who suffer most.

Here's an excerpt from an impact statement put before the court which found against the council on what appears to be a technicality: "Residents were driven from their homes, a children's birthday party was ruined and even a funeral in Wheldrake was interrupted by

the noise. Residents were forced to wear ear plugs and headphones in order to live in their properties. Businesses and residents were unable to have telephone conversations."

And as a judgement notes curtly: "There is no evidence that Formula 1 testing has any demonstrable value to the local community."

Performance bike firm Prodrive has designed a 'quiet' silencer for racing motorbikes in ten weeks.

So why has it taken so long for the industry (and the muppets who illegally drive off-road bikes) to work out that if you have a quiet bike, they'll be left alone to get on with what they enjoy?

European pressure group T&E claims a new European standard on vehicle noise could allow them to become louder. In a story that would look like a good April 1st joke, it appears that the UNECE standards body has delegated control of noise standards to engineers linked to Porsche.

They claim the new standards favour loud, low growling type noise up to 10 decibels louder than current standards. Oh dear!

## NOISE EVENTS 2009 / 2010

### 26th-28th October 2009

#### EURONOISE 2009

to be held in Edinburgh, website [www.eurnoise2009.org.uk](http://www.eurnoise2009.org.uk)

### 26th November

#### NOISE MAPS – RIGHT OR WRONG?

An evening IoA Midlands branch talk by Nick Tinsdeall to be held in Solihull. Website [www.ioa.org.uk/events](http://www.ioa.org.uk/events)

### 3rd-4th December

#### THE EU DIRECTIVE 2002/49 (END) CHALLENGES OF THE

European railways – options and obligations, UIC workshop to be held in Copenhagen, Further information: Lisette Mortensen, [limo@bane.dk](mailto:limo@bane.dk)

### 7th December

#### COMPARISON OF NOISE IMPACTS FROM URBAN TRANSPORT

Institution of Civil Engineers evening meeting to be held in London, [www.ice.org.uk](http://www.ice.org.uk)

### 8th December

#### NOISE AND NUISANCE ENFORCEMENT: A PRACTICAL BRIEFING ON CURRENT LEGISLATION

CIEH one day conference to be held in London [www.cieh.org/events](http://www.cieh.org/events)

### 9th December

#### THE ART OF BEING A CONSULTANT

A meeting to be held in Manchester aimed at young consultants, those new to the profession and students who are considering a career in acoustics. Website [www.ioa.org.uk/events](http://www.ioa.org.uk/events)

## 2010

### 27th January

#### WIND TURBINE NOISE

Inaugural meeting of the Welsh Institute of Acoustics Branch, Linda Canty, IoA 01727 848195

### 10-11th March

#### NOISE SPRING WORKSHOP



Two day/overnight spring workshop organised by Epuk and to be held at Woodside, Kenilworth. Call for papers: [mary.stevens@environmental-protection.org.uk](mailto:mary.stevens@environmental-protection.org.uk)

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## CREDITS



**Editor: Jack Pease** tel 01737 642283

mobile 07590 488432 (fax 01372 700400)

email [jackpease@empublishing.org.uk](mailto:jackpease@empublishing.org.uk)

Website: [www.noise-bulletin.org.uk](http://www.noise-bulletin.org.uk)

**Marketing: Jackie Luff** tel 01737 645348

email [marketing@empublishing.org.uk](mailto:marketing@empublishing.org.uk)

### Associate editors:

Lis Stedman tel 01492 642360 email [lis.stedman@empublishing.org.uk](mailto:lis.stedman@empublishing.org.uk)

Lisa Russell tel 020 8552 7464 email [lisa.russell@empublishing.org.uk](mailto:lisa.russell@empublishing.org.uk)

Subscriptions: 01737 642283, POBox 592 Redhill RH1 3WN

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*Jack Pease*

