

NOISE

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BULLETIN

COMPLAINTS

Noisiest councils ranked

Perhaps the most comprehensive picture yet of noise nuisance across the UK has emerged thanks to noise insulation supplier Rockwool.

Rockwool served freedom of information requests on every local authority in the UK to gather data on Asbos and noise abatement notices. The data goes some way towards plugging the gap left by the declining usefulness of the CIEH/Defra figures on noise.

Rockwool got 332 responses to its Fol requests sent to the UK's 436 councils (a 76% response rate) in May 2009.

Findings include:

- UK councils received 295,098 complaints about noise from private residences in the last 12 months;
- Westminster City Council received more noise complaints per head of population than any other local authority in the UK. One in every 25 residents has complained to the council about noise pollution experienced in their homes;
- Local authorities served 7,442 noise abatement notices over last 12 months (*Editor's note: CIEH's survey of England, Wales and NI (but not Scotland) found 5,431 abatement notices served*);
- 710 anti-social behaviour orders were secured by councils on the basis of noise;
- Seven of the top 10 councils ranked by complaints per 1,000 residents are located in London.

Rockwool says its results suggest a postcode lottery in councils' response to noise complaints: "Local authorities' enforcement strategies to prevent neighbourhood noise

pollution vary markedly across the country. While Edinburgh City Council has been extremely active, enforcing 27 confiscations of equipment in the last year, 213 councils across the country have not made a single confiscation.

"Across the UK, 506 confiscations of equipment have been authorised in the last 12 months, involving the removal of powerful speakers, stereos and televisions." (*for comparison, CIEH's most recent survey showed 171 seizures*).

Noise has been cited by local authorities as grounds for granting an Asbo in over 710 cases in the last 12 months but some 273 councils did not secure a single Asbo on grounds of noise disturbance in the last 12 months.

"Across the UK there are huge differences in local authorities' treatment of domestic noise complaints. While some councils focus on mediation and negotiation,

others operate a strict policy of enforcement and confiscation of equipment. Many householders are relying on their local authority to take appropriate steps to protect their health.

"Britons seeking peace and quiet should move to the Isle of Scilly, which did not record a single complaint about noise from a private residence in the last 12 months. Highland areas of Scotland and the surrounding isles were also bastions of tranquillity, recording less than one complaint per 1,000 residents in the last year."

Rockwool continued: "Householders should be aware that along with the official channels that exist to complain about noise, there are pro-active steps they can take to help reduce unwarranted noise entering their homes. Installing loft, cavity wall and external insulation can significantly reduce nuisance noise, while also reducing energy bills and cutting fuel costs."

● www.rockwool.co.uk

'NOISIEST' COUNCILS

Councils with the highest noise complaints per 1000 residents (source Rockwool's Fol requests to councils)

Council	Complaints per 1000 residents	Total number of complaints
Westminster LB	42.32	9,814
Haringey LB	42.10	9,500
Tower Hamlets LB	29.38	6,252
Hackney LB	27.33	5,695
Newcastle City Council	26.22	7,091
Newham LB	25.45	6,352
Durham County Council	25.36	1,089
Waltham Forest LB	25.29	5,607
Lambeth LB	19.03	5,174
Belfast City Council	19.01	5,085

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IN BRIEF

MPs on licensing

MPs have called for pubs and clubs to be allowed more temporary event notices (TENs) despite concerns that they can be abused and lead to a noise nuisance.

The House of Commons Culture, Media and Sports Select Committee looked at licensing in its latest report. It includes many suggestions on how to improve the workings of the 2003 Licensing Act.

On TENs, it notes that at the moment, only the police can object on grounds of crime prevention, and they must object within 48hrs of receipt of the application. The views of the public cannot be taken into account, nor is there the potential for noise nuisance be taken into account.

MPs say: "We recommend that, in addition to the police, councillors, as elected representatives of the public, should be able to object to a TEN, and that the period for such objections should be three working days to allow both the police and councillors time to consider adequately whether they wish to object."

Subject to that recommendation, the committee suggests that the current maximum number of TENs be lifted to 15 a year.

Other recommendations include that the Government should exempt venues with a capacity of 200 persons or fewer from the need to obtain a licence for the performance of live music and the reintroduction of the 'two-in-a-bar' exemption enabling venues of any size to put on a performance of non-amplified music by one or two musicians without the need for a licence.

● *The Licensing Act 2003 Sixth Report of Session 2008-09* can be viewed on www.publications.parliament.uk/pa/cm/cmcmds.htm

See also feature, page 4

IN BRIEF

Post note on noise

The Parliamentary Office of Science and Technology has released a briefing note on noise.

● It can be viewed on www.parliament.uk/parliamentary_offices/post/pubs2009.cfm

IoA freezes fees

The Institute of Acoustics has agreed to freeze membership fees for 2010.

The decision was made due to the current economic climate in order to ease the financial burden on members during the recession. The council also agreed that as from January 2010 all members over the age of 70 will be given a 50 per cent reduction off the current member's rate, regardless of their employment status.

IOA president John Hinton said: "We are pleased to help our members in any way we can in this difficult time. So we are glad to offer membership fees next year at the same as 2009."

● www.ioa.org.uk

HEALTH EFFECTS

Pinning down noise costs

An expert group has attempted to cost the health effects of noise. While they have struggled to monetise many impacts, for heart attacks they suggest that high ambient noise exposure can increase risk by as much as 50%.

The work was carried out by Bernard Berry and Ian Flindell for Defra's Interdepartmental Group on Costs and Benefits. The IGCB commissioned the study as it needed to be able to include more robust costing of noise in Defra policy (*Noise Bulletin Aug/Sep 2008 p5*).

Five key health impact areas were considered – annoyance, mental health, cardiovascular disease (eg heart attacks), sleep disturbance and children's learning. Only cardiovascular disease and sleep disturbance were studied in detail, the others rejected as there was "no prospect" of developing robust dose-effect relationships.

The report concludes: "The best currently available research suggests an increasing relative risk of myocardial infarction (heart attack) in people living in

areas with road traffic sound levels measured outdoors above 65dB LA_{eq 16hr day}, increasing up to about 1.4 to 1.5 in areas with road traffic sound levels measured outdoors above 75dB LA_{eq 16hr day}. The data suggests no increase in relative risk in areas with road traffic sound levels measured outdoors below 65dB LA_{eq 16hr day}.

"In relation to sleep disturbance, a systematic review using the developed evaluation criteria has shown that there appears to be no exposure-response relationship that sufficiently meets all required criteria for a robust dose-response relationship for noise induced sleep disturbance applicable for policy application in relation to monetary valuation of adverse health effects."

The report warns that trying to tot up the benefits of action on noise is subject to confounding, especially by air pollution. High air pollution (with well researched health effects) tends to track high noise: "None of the research

which has been published to date has been able to resolve the confounding effect of correlated levels of air pollution. This means that it is not possible to predict on the basis of the available data whether noise management action which successfully reduces environmental noise sound levels but without simultaneously reducing associated air pollution will have the desired effect in terms of reduced prevalence of adverse health effects or not."

There is strengthening evidence that noise causes hypertension (stress), which causes very real health outcomes. Dose responses relationships are being proposed, but the current report felt that work is not sufficiently advanced as yet, but should be watched closely.

● *Estimating dose-response relationships between noise exposure and human health in the UK* can be viewed on www.defra.gov.uk/environment/noise/igcb/publications.htm
More details next month

HEALTH EFFECTS

Ad hoc expert group produce ad hoc report on noise

An expert group has finished its draft review of noise.

The Ad hoc expert group on the effects of environmental noise on health was formed in 2004. It had been hoped to produce a report within a year.

Five years on, the report has disappointed some. Mary Stevens from Epuk commented: "The expert group was convened many years ago and its failure to come up with more concrete conclusions is disappointing. We've got the maps, we've got the numbers, we've got the health effects, the report says that a lot of people are suffering from noise so surely its time to get on with properly assimilating noise mitigation into policy."

The expert group has suffered from funding and staffing changes from when it was first mooted in 2002. Funding problems early on led to it having fewer members than originally anticipated. The

transfer of chairman Bob Maynard from the Department of Health to the Health Protection Agency, and Maynard's diversion to air pollution and nanoparticles, led to further stalling. In a bid to get the project moving, an outside academic was pulled in to write the report based on evidence appearing before 2008.

The report concludes: "Environmental noise is a problem in the UK today and many people are concerned about its possible effects on health. In terms of wellbeing we have little doubt that a significant number of people are adversely affected by exposure to environmental noise. If it is accepted that health should be defined in such a way as to include wellbeing then these people can be said to suffer damage to their health as a result of exposure to environmental noise.

"There is increasing evidence that environmental noise, from both aircraft and road traffic noise is associated with raised blood pressure and with a small increase in the risk of coronary heart disease. Evidence that environmental noise damages mental health is, on the other hand, inconclusive.

"We strongly urge that a programme of research into the effects of environmental noise on health in the UK be established. A number of recommendations for further research have been made. We recommend that an Expert advisory committee on environmental noise and health be established (as opposed to being ad hoc).

"The remit of the standing committee should be to advise government departments on the effects on health of exposure to environmental noise, to review the literature of the field on a regular basis and to advise on

the need for further research."

Epuk commented: "With 10% of the UK population exposed to daytime noise above 65dBA, an Expert advisory committee on environmental noise and health is urgently needed if we are to have an informed noise action planning process. Air quality management is underpinned by advice from the Committee on the Medical Effects of Air Pollution – it is about time the impacts of noise on health are addressed as seriously."

The expert group included consultants Bernard Berry and Geoff Leventhall, academics Stephen Stansfeld, Bridget Shield, Ian Flindell and Andy Smith, along with 'observers' from the Departments of Health and Defra.

● *Environmental noise and health in the UK – draft for comment* can be viewed on www.hpa.org.uk/noise
More details next month

LEGISLATION

Regs elicit mixed response

Defra has released responses to its consultation on amending the noise regulations.

The amendments were intended to streamline Defra's responsibilities for complying with the European Noise Directive (*Noise Bulletin April p1*).

There were 34 responses to the consultation. The yes/no responses include:

- Do you agree with the proposed amendment to regulation 13 regarding the identification of quiet areas? (yes 21, no 7);
- Do you agree with the proposal to revoke the duty as regards consolidated noise maps in regulation 14(2) and to replace this with a power on the Secretary of State to produce consolidated noise maps in respect of any area? (yes 15, no 14);
- Do you agree with the proposal to revoke the specific

duty on the Secretary of State to publish guidance in regulation 14(1) and to replace this with a general power to publish guidance? (yes 6, no 20);

A number of more detailed concerns were summarised by Defra:

- Some respondents felt that the amendments to the regulations further weakens the UK's ability to manage noise and are not in line with the intentions of the Environmental Noise Directive;
- There was an opinion amongst some respondents that consideration should be given to the establishment of an independent body that would oversee the noise action planning process;
- It appeared that where the proposed amendment altered a duty to a power, there was a belief that the relevant power would never be exercised;
- In particular, with regard to

the proposed removal of the duty in regulation 14(1) regarding the production of guidance, and the proposal to replace it with a more general power under regulation 30, there seemed to be concern that the outcome would mean that no such guidance would be issued;

● Concern was expressed at the timing of the identification of quiet areas in relation to the publication of the airport noise action plans. It was viewed that the process of identifying quiet areas could be compromised by the publication of the action plans.

● Defra's summation of consultation responses (ie not the actual responses), and Defra's response to the responses, can be viewed on www.defra.gov.uk/corporate/consult/envirnoise-regs2006/summary-responses.pdf

BUSINESS

Environment consultants suffer in the slump

Environmental consultants have been ranked in a new in-depth survey carried out by Environment Analyst Publishing & Research.

The report concludes that the UK environmental consultancy sector grew by 9% in 2008 to reach a turnover of £1.46bn. This marks a deceleration on the average 13% annual growth between 2004-07.

It notes that consultancy tends to lag in economic cycles due to work signed off in the pipeline months in advance, so it was not until the last few months of 2008 when the tide turned and environmental consultancies were suddenly struggling to keep all of their staff busy.

Environment Analyst's market research has identified over 500 companies active in the environmental consultancy sector employing more than 25,000 people. The UK sector remains highly fragmented, with some two dozen firms achieving UK environmental consulting revenues in excess of £20

million.

The top ten, in order of market share, are RPS, AEA, Atkins, RSK, Entec, Jacobs, ERM, Mouchel, Mott MacDonald and Arup.

Behind those follow WSP, Aecom, Halcrow, Hyder, MWH, SLR, WYG, Enviro and URS.

Environment Analyst believes that 2009 will be one of the most challenging years UK consultancies will see, with firms projecting a drop of 7% in

their revenues in the current financial year. Overall market growth will be flat.

The most resilient areas will be climate change and energy, ecology/landscape and waste management services.

● *Market assessment of the UK environmental consulting sector 2009* is available to Environment Analyst's Market Intelligence Service customers via the website, www.environment-analyst.com/intelligence

Best and worst cars ranked

The Environmental Transport Association has named and shamed the best and worst cars in terms of their environmental impact (including pollution and noise).

Its green car of the year is the Honda Insight, a family-sized hybrid that is providing stiff competition for the ubiquitous Toyota Prius. It says the least green car was found to be the 8-litre Dodge SRT-10 sports car. "A year's driving in the Dodge emits the same amount of carbon dioxide as is absorbed by 322 mature trees – the equivalent of an acre of oak forest."

The ETA examined over 1300 models of car currently on sale in Britain and compared their power, emissions, fuel efficiency and even the amount of noise they produce to create a "definitive guide to buying the greenest vehicle".

- www.greencarawards.co.uk

IN BRIEF

Act inadequate

Epuk and Lacors have expressed concern at the "inadequate protection for local communities" in the 2008 Planning Act.

They say: "Councils want to act in the best interests of local people and need time to consult on issues relating to major projects. There can be serious impacts from noise, dust, smoke, odour and light from major infrastructure development and local people should be able to have their say. But with the current 28 day consultation period, and weakened protection from nuisance, there is a fear that communities will be left suffering from poorly planned large scale developments such as power stations."

The two groups are urging the government to include the following:

- Guidance on what constitutes a realistic consultation period for major developments (13 weeks is preferred);
 - An additional model condition requiring the periodic review of the schemes required to manage and mitigate against nuisance – this will ensure that unforeseen problems are adequately addressed, and that the local environment is protected;
 - A mechanism for dealing with complaints that arise regarding any development – as part of a requirement that continued and open dialogue is maintained between builders and developers, and the community;
 - Reference should be made to existing guidance and codes of practice for managing the impacts on, and quality of, the local environment.
- Epuk says: "We accept that some short-term impact is an inevitable consequence of any development, but local nuisance impacts are manageable by proper planning and operation. We do not believe that respect for the quality of life of neighbouring citizens should present a barrier to necessary and appropriate development."

Conditions for music noise

Speakers and delegates at a recent IoA meeting highlighted the difficulties of agreeing appropriate conditions for managing music noise from licensed premises. Lisa Russell reports

There is no easy solution when setting noise limits as part of licensing conditions, as was apparent at the IoA's recent meeting, *Did you hear that? – concepts of audibility and inaudibility*. Proponents of both subjective and objective conditions each saw shortcomings in the other approach. There were also suggestions that there is no need for licences to have any additional noise conditions, as other safeguards exist.

Conditions can be added to premises licences to help achieve the four stated objectives of the Licensing Act 2003 (LA03) concerning public safety, the prevention of crime and disorder, protection of children from harm and the prevention of public nuisance.

Various consultants at the event cited difficulties with the use of subjective criteria – particularly for one-off events where there is little scope for repeated checking and refinement of sound levels (*Noise Bulletin May 2008*).

However, South Oxfordshire District Council has found its own subjective condition to be robust. Ben Coleman and Simon Hill of the environmental protection team explained their use of a condition that states: "Noise emanating from the premises as a result of regulated entertainment shall not be clearly audible at the boundary of any adjacent residential premises". This condition avoids the practical problems of deciding on an actual level that prevents public nuisance, while not being unduly onerous on the operator, they believe. And it allows the owner to judge compliance without needing to buy – let alone understand – a sound level meter.

A professional judgment can then be made by an experienced officer if complaints are received. "We are not requiring complete inaudibility," stressed Coleman. Inclusion of the word 'clearly' before audible is intended to avoid complaints where the sound can only be heard by pressing your head against the wall. It is designed to avoid spending time on trivial 'technical' breaches. "This type of judgement is well within the skill set of environmental protection officers who are used to making statutory nuisance assessments on relatively subjective areas already," he said.

Specifying "at the boundary" was also key, as this is a location to which the premises holder should have unrestricted access.

There is guidance available under the LA03, though public nuisance is not defined. "Effectively it is left to responsible authorities to develop an understanding and

approach themselves," says Coleman.

South Oxfordshire's officers take the view that there is strong justification under the LA03 for a proactive approach. Their opinion is that if the requirements matched other legislation, then there would be no need to consider noise impact under the licensing regime, as this would involve duplication.

Case law has led to some inconsistent rulings with regard to public nuisance, said Hill, which he hopes will be resolved. The issue is whether public nuisance is interpreted in its strict common law sense as affecting a large number of people, or whether the scope includes low-level nuisance affecting just a few people.

There may also be future changes following a recent report (*see news, p1*). South Oxfordshire has concerns about this, particularly the proposed reinstatement of the 'two in a bar' rule, which remove restrictions on non-amplified music by one or two musicians. The report also recommends exemption from obtaining a licence for live music for venues with a capacity of 200 people or fewer.

Some consultants in the audience appeared unconvinced by South Oxfordshire's use of the 'clearly audible' approach. "I don't see how moving away from an 'inaudible' condition to a 'clearly audible' one helps at all. When does it stop being 'inaudible' and become 'clearly audible'?" said one delegate. Coleman responded that it is a professional decision that also takes account of the noise's impact in judging whether there is simply a technical breach or one that requires enforcement action.

"Is there a possibility for inconsistency?" asked a member of the audience, to laughter. "Clearly there is, like any statutory nuisance assessment," said Coleman. "Different people will have different perceptions. We haven't taken enforcement action on the basis of one single-witness breach." Hearing acuity in individuals prompted some debate. Hill said that for a complaint to be taken further, it would involve a number of complaints witnessed by more than one officer. Action would only be taken if all were in agreement that there was a sustained problem.

Another summed up the difficulty that is faced by consultants working for premises owners. "How do we as consultants design to 'clearly audible' if we have no idea what it is? We have to design to numbers."

The difficulty with measurements is that the background environment could change, said Hill, and the 'clearly audible' condition takes that into account. "I don't think that

setting a numerical level makes the situation any more transparent," added Coleman. In setting an absolute level, there would be situations where the licence holder complied with the condition, but the condition wasn't effective.

A consultant with extensive experience of controlling music noise at events is Vanguardia Consulting's Rob Peirce, who presented a paper on noise criteria and audibility for outdoor live music. He has encountered a range of criteria, standards and licence conditions in working on events ranging from rock concerts to wedding parties in small marquees.

Vanguardia's view of one-off events is that a night-time limit of $LA_{eq,T,45dB}$ at the facade of any noise sensitive dwelling has correlated well with the onset of complaints.

The Noise Council Code of Practice on environmental noise control at concerts is widely used for outdoor concerts, particularly in daytime. The code states that 'for events continuing to be held between the hours 2300 and 0900 the music noise should not be audible within noise sensitive premises with windows open in a typical manner for ventilation' but does go on to add some notes acknowledging a lack of consensus.

This is not the only source of guidance on noise for occasional outdoor events, Peirce pointed out. He also spoke about the Noise Act, which defines an offence based on exceeding an objectively-measured sound level. The permitted level is set at 34dBA if the underlying level of noise is no more than 24dBA, or 10dBA above the underlying level of noise where this exceeds 24dBA.

These levels were set as a result of research that was carried out for Defra and was primarily aimed at one-off events (*NB June 2006*). "We found in some cases that there was an incredible tolerance of residents to noise," he said. The onset of audibility of the entertainment noise did not equate to a threshold of acceptability.

Guidance on noise criteria is also published by WHO and in BS8233. WHO says that outside sound levels at night about 1m from façades of living spaces should not exceed 45dB LA_{eq} , while the British Standard quantifies reasonable bedroom conditions at 30 to 35dB LA_{eqT} .

A 1997 event with multiple noise sources at Turweston Aerodrome introduced a standard that has been successfully adopted at many others since, said Peirce. The local authority set a night-time noise standard of 45dB $LA_{eq,10min}$ at the facade of any noise-sensitive dwelling. No complaints were

UNHEARD BUT STILL ILLEGAL

received when the level was below 45dB, but on occasion the level rose. "When it went over 45dB we did get complaints," he said. A reduction stopped the complaints. "It seemed to indicate that 45dB was a reasonable guide to when complaints will come in."

A delegate raised the issue of uncertainties with ambient noise close to the level of the music noise. Most of Vanguardia's events are in rural areas where this is not an issue, said Peirce, but it might have to be taken into account in noisier locations where there may be a need for subjective criteria alongside objective ones.

Glastonbury has a night-time limit that Peirce sees as working well. The daytime condition is more stringent than the code in some ways and lenient in others. After these times the noise is judged against a criterion of whether the music is 'audible and discernible' above the general noise from the site. Although open to interpretation this has been successfully applied at many Glastonbury festivals, he said. There is always a murmur of noise from the site – it is never inaudible, he said. But the condition recognises whether an individual noise stands out.

Further research is required into low frequency limits, he said, including the time period the noise is measured over. At some night-time events a low frequency noise limit has been set in the 63 and 125 Hz octave bands alongside an $L_{A_{eq,T}}$ limit, though in practice complaints tend to correlate most closely with the 45dB general value.

Vanguardia has also encountered conditions that set an L_{max} , but this gives no time to carry out control. "As soon as you hit that level you are in breach. From our point of view, that's not something we can actually comply with," he said. Similarly, time intervals of a minute are hard to work with.

Where possible, the company tries to agree an objective limit. "This allows predictions to be undertaken and a method to be agreed with the environmental health practitioners," said Peirce. "It also allows us to determine levels at a sound desk in advance of the event to assess its viability."

Michael Eade of ENcentre presented a paper examining whether inaudibility conditions are compatible with the LA03. He said that inaudibility conditions were a firm favourite with licensing officers before the Act. The Act envisaged a new approach to controls, he said, providing more freedom to operators "but if those new freedoms were abused, a range of different enforcement actions are available to remove those freedoms. But in many cases, the use of conditions has not fallen."

The Act places a number of constraints

Just because no-one can hear the noise doesn't necessarily mean that it isn't present at levels loud enough to breach contractual limits. A paper by Andrew Munro of Munro Acoustics focused on the threshold of audibility for low frequency noise intrusion in very quiet environments.

In the process of measuring low frequency noise in very quiet environments – mainly recording studios – he has noticed a great difference between "what I'm measuring and what I'm hearing – or more to the point, not hearing".

Various criteria are in use for recording studios and concert halls. His interest in the topic arose from trying to match the NR15 curve.

Measurements in the studio registered levels above the curve even though the noise intrusion was not audible to anyone present. Further analysis showed a peak signal duration of approximately 1 second at 63Hz, the source being a bus. It was discovered that the outer wall was resonating at 63Hz and that bridging of the isolation shell transmitted this to the interior.

Another sound of longer duration – three or four seconds – could be heard even though it was no louder. It has been accepted since the late 1960s that the hearing system relies upon both temporal integration and bandwidth to establish loudness, said Munro. Low frequencies will not sufficiently stimulate a hearing response unless they have duration of at least 500 milliseconds. This may not be of any great relevance to steady-state or slow-variance noise, such as ventilation systems, but it can matter greatly in the case of impact and vibration-induced

sounds.

He found that the threshold of hearing between 50Hz and 100Hz was considerably higher than published data – in extreme cases it was almost 10dB more.

As the event duration – the pulse of the sound – reduces from about a second towards the hundreds of milliseconds, there is a considerable increase in the threshold shift. "The sound has to become that much louder before you can hear it." For very short duration pulses, the threshold shift is as much as 30dB.

It has been the habit of some consultants to use $L_{den (fast)}$ as the preferred method of measurement for intrusive noise, he said. But, as most intrusions are short in duration, this can lead to overstatement of the audibility. There is further clear evidence that intrusions of up to 10dB above NR15 will remain inaudible under some conditions of duration and bandwidth. The exact reason for this is not entirely clear, given that researchers have determined that temporal resolution of people's hearing mechanism appears to be shorter than the events in question. One possible answer could be critical bandwidth masking, where one pitch will mask another.

"It is particularly important for anyone in the field of studio design as NR15 values are used as absolute criteria for performance," he said.

Curves such as NR15 are fine for steady-state noise. "But noise intrusion into studios is very intermittent and usually caused by traffic or impact noises, or even music noise from another studio." Contract breaches can arise – even if no-one can hear the sound.

over the application and extent of conditions, said Eade, allowing action only within the scope of the licensing objectives. "If it doesn't relate to the objectives, it shouldn't form a condition."

To most people and the dictionary, inaudible means unable to be heard, he pointed out. Adopting a literal understanding not only provides clarity but also enables local people to remain engaged in the licensing process. "In addition, measuring audibility by ear is a lot simpler than taking of objective measurements or making an assessment of nuisance," he said.

One of the main benefits of subjective assessments may be demonstrated in *Godfrey v Conwy County Borough Council*, said Eade. "Here, noise from a rural recording studio did not produce a measurement on a noise meter because of background farm activities yet was still found to be a statutory nuisance based purely on the opinion of an authorised officer."

There is a considerable overlap between

public, private and statutory nuisance, he said. "Common to all three categories of nuisance are the concepts of give and take. Nuisance laws seek to balance the interests of the parties." However, he felt that a lot of local authority enforcers did not consider the impact on someone's business.

Guidance for the LA03 states that the prevention of public nuisance could include low-level nuisance perhaps affecting a few people living locally as well as major disturbances affecting the community. This has caused some confusion, says Eade, and he feels it to be unlikely that Parliament intended to allow a business to be shut down on the basis of a single case of 'low-level' nuisance.

Eade acknowledged that forming a condition that is sufficiently precise and reasonable is difficult. If the matter can be dealt with through existing statutory nuisance powers and reference to case law, then Licensing Act conditions should be avoided to prevent duplication, he suggested.

● IoA, Linda Canty 01727 848195

Vehicles: measuring nuisance

Manufacturers boast that vehicles are getting quieter. That ignores what their owners do to them, finds Lis Stedman

TRL's in-service vehicle noise measurement study, prepared for DfT, deals (or should) with a significant potential area for transport noise reduction, the noise that vehicles make once in service.

In theory, given the sorts of modifications that long-suffering estate residents know are made to cars (particularly to exhausts) to enable them to sound 'cool', this report should provide timely guidance. But does it?

It begins well enough by noting that the DfT receives large numbers of complaints about noise from individual vehicles, focusing on noise from exhaust systems. DfT therefore commissioned TRL to review in-service noise measurement techniques in other countries with a view to enabling development of a simple measurement technique for the UK to help roadside enforcement of Construction and Use Regulation 54 (of the Road Vehicles (Construction and Use) Regulations 1986, which covers silencers and their noise levels).

Phase 1 of the study was a literature review, giving an overall assessment of the problem and looking at currently used and potentially usable in-service noise measurement techniques to assess them for suitability. From this global trawl TRL unearthed a number of possibilities, inter alia the UN-ECE regulations, various ISOs, the MOT itself, the EPA 1990 and the Statutory Nuisance Act 1993.

Many of these fail for various reasons: the EPA 1990, as is well known, does not cover moving traffic noise and the concept of statutory nuisance, while potentially covering noisy exhausts, would only do so if a 'reasonable and persistent' disturbance could be proved. The MOT covers defects but not noise, or at least not objectively, and UN-ECE 59 and 92 (on standardisation of replacement silencers and motorbike exhaust silencer approvals respectively) have no legislative force in the UK. Interestingly the Single Vehicle Approval system (which only covers vehicles such as kit and imported cars intended for non-European Economic Area markets) does have an exhaust noise test.

The previous TRL work outlined is of interest in that the test developed (which involved revving rapidly to 4000rpm) was found to give better correlation with the type-approval tests than the ISO close proximity test (that they should correlate was a basic premise of the project). A fundamental problem with using ISO 5130 for in-service testing was highlighted, in that not every vehicle has a rev counter, so

it can be difficult to measure engine speed. Using the vehicle's own instrumentation was not thought to be ideal.

There were also concerns that the way the vehicle was being driven might give rise to noise levels that would mean the test did not correlate well with the type-approval test. A remote instrument designed specifically for conformity testing was highlighted as a better choice.

It was found that other countries did indeed have interesting methodologies, though most of them seem to be on the other side of the world – Australia has "label match-up" checks as part of regular roadworthiness inspections – labels have to be stamped on the exhaust denoting its compliance with noise and environmental legislation, for instance. In New Zealand, the police can issue an instant NZ\$250 (£98) fine if they believe ("having regard to all the circumstances") that someone is operating a vehicle that is creating an excessive noise – a catch-all that also covers stereos and "boom boxes". Points can also be awarded and police can sticker a car, which means it cannot be driven until it has been tested and found to be within the legal noise limits.

Japan has an in-vehicle test closely aligned to ISO 5130, and in the US the EPA has set noise emission standards for motorcycles – all bikes must have an EPA label on the chassis and exhaust pipe. Norway has an MOT-style noise test which though initially subjective, moves on to an objective test if the noise level is thought to be abnormal. Germany is also apparently very keen on nabbing noisy motorcyclists, whether in traffic or during MOT-style inspections. However, a review proved that the existing roadside test catches only a third of illegal motorbike exhausts, so a new draft test protocol has been developed but not put in place.

The review reached a number of conclusions, one being that the previous TRL work on a noise test was "constrained by the need for test results to correlate with type-approval levels", and another fairly obvious observation that most complaints relate to vehicles fitted with performance exhaust systems.

Other countries, the authors averred, had not come up with anything very different from the ISO 5130-defined exhaust noise test. Other areas of enforcement are concerned with subjective evaluation of noise levels, they added.

A further, rather mysterious observation is that "many different options are available to control the problem of noisy vehicles".

The use of UN-ECE 59 and 92 is highlighted as a key means of controlling exhaust noise, with the report concluding that "its adoption into national law should be examined". It also notes that several stationary exhaust noise measurement techniques are thought to be suitable for further investigation.

In the overview segment assessing the problem, the report skips through traffic noise complaint data, the BRE noise attitude survey responses, and MOT exhaust failure data, none of which can be correlated with exhaust noise to any degree. MOT failure data, for example, is most likely to relate to defects such as corrosion and leaks, though the report suggests that "an exhaust that suffers from leaks is also likely to be noisy". As less than 4% of MOT failures relate to exhausts in any way, the key conclusion is that poor maintenance is unlikely to be a factor in the problem of excessively noisy exhausts.

Original equipment manufacturer and pattern exhausts are also exonerated as culprits. The report puts the blame squarely onto performance exhausts, acknowledging that it is now "common practice" to add or replace some components to create extra noise. The authors add: "It is considered that it is these systems, which appear unregulated, that are by far the main problem area." The problem is identified (as most estate-dwellers could have told TRL) as young drivers with high insurance premiums, who can't afford proper performance cars, buying cheap vehicles and "individualising" them.

Dodges used to cheat tests are mentioned, including engine rev limiters, which control RPM when stationary and make a static acceleration test problematic, and so-called "dB killers" which can reduce exhaust noise and would have to be checked for before MOT-type tests. Systems to limit exhaust gas flow are flagged as a problem, but these are likely to be banned, TRL predicts.

TRL rather dismisses the possibility of other parts of cars being modified to produce noise, despite the conclusion that could be drawn from the test dodges, that there is a will to make noise out there. The report states that "if a restriction on noise from exhaust systems is successful then either manufacturers or owners might seek to make other areas of the vehicle noisy, although it is considered this is unlikely." As mentioned in the last issue (*Noise Bulletin May p12*), the practice of fixing lemonade bottles around the engine air breather pipe, which makes a small engine roar, would seem to prove this conclusion to

be optimistic.

TRL does go on to note that apart from the engine, the only other noise producing option is considered to be “changes to somewhere else in the exhaust system. This could be closer to the engine, for example where the exhaust gasses first exit the engine. If a test is developed where the microphone is positioned mid-vehicle then this would go some way to tackling this potential issue.”

The report also outlines the pros and cons of directly relating any in-service test to type-approval testing – basically, if there is a link there is no risk of a vehicle failing the in-service test but passing type approval, but a link would restrict the range of tests that could be used, and additionally a drive-by test like type-approval is not suitable for roadside use.

The document also runs through exacerbating factors such as the increasing number of large motorbikes on the road and climate change (promoting both bike use and an outdoor lifestyle), and the possibility of new or changed legislation. Proposed changes to UN-ECE Regulation 51 will bring in new type-approval tests, which although likely to be more stringent, are predicted to have little impact until the majority of the existing fleet has been replaced.

Tyre noise limit values have not significantly reduced individual vehicle noise, TRL observes, and even if future legislation produces still-quieter tyres, this will have most impact on high-speed roads where tyre noise predominates as the noise source. The possibility of vehicle control schemes and low emission zones, covering noise as well as air (as the current London zone does) is also mooted. The report also highlights doubts about adopting UN-ECE Regulation 59 into UK law – these relate to the existing wording, which could be seen as excluding performance exhausts.

The report also assesses process and technology-based techniques to control in-service noise. Rather defeatist doubt is cast on the development of an in-service noise test, as the authors note that it could not address all of the noise concerns covered in the Construction and Use Regulations because “to introduce an in-service test that would in some way prevent excessive noise due to inconsiderate behaviour would be impractical because excessive noise may not be dependent on noise level alone but on other circumstances such as time of day and location.” In other words, it’s not always the exhaust, but the owner’s behaviour that’s to blame.

A range of possible ways of preventing or controlling exhaust noise is mooted, but only a few options are put forward as recommendations for further consideration. Some – such as a suggestion that new drivers should be forced to drive a standard

vehicle – are obviously unworkable. But other seemingly useful suggestions are also given the thumbs down, such as designating performance exhausts as for track use only, as TRL says it would be difficult to regulate and detect them, and such a restriction might increase the number of home-made devices. This would seem to suggest TRL accepts that if people want to make their car noisy, they will. Even a tax on noisy vehicles is snubbed with the note that it “could be very difficult to implement”.

Out of the heap of rejections, the few ideas getting the green light are “further examination of other datasets relating type-approval noise levels to the results of [drive-by] stationary tests” (later data proved there is no relationship); looking at adopting UN-ECE Regulation 92 for approval of replacement motorbike exhaust silencers; and development of a spot check noise test.

The requirements and options for a roadside test are outlined at length, with the first recommendation being that the UN-ECE Regulation 51 noise test should be conducted as a standard control test in a test programme. Other green lights for testing are measuring the maximum noise level from the vehicle when it is started up; stationary acceleration to a predetermined level; measurement of the average maximum noise during stationary acceleration; a variation on the stationary test, measuring the noise at a number of engine speeds during acceleration; and a measure of noise with the engine at idle.

The summary recommendations from Phase 1 are that the UK should adopt UN-ECE regulations 59 and 92, ensuring that they are reworded to address replacement exhaust system parts, and that various stationary exhaust noise measurement techniques for roadside tests be developed.

Phase 2 of the work was the practical investigation, which evaluated the recommended tests and their relationship to type-approval levels, recommending an in-service test method that could be used for roadside enforcement. The ubiquitous Ford Focus was used for the tests, as there is a wide range of after-market exhausts that fit it. The report coyly notes that “it lends itself to modification in terms of enhanced visual appearance,” which does at least prove that TRL has a sense of humour.

The nine exhausts tested covered a wide range of different designs. The sound injection test hit early problems – it was found that a sound source could not be injected directly into a catalytic converter, so a signal generator was used to produce white noise to a loudspeaker placed in the engine compartment and a microphone at the tailpipe (and vice versa).

There were significant difficulties with both procedures, and TRL notes in conclusion that “a technology-based method

using an artificial noise source was found to be unsuitable for further development as a roadside test.” The investigations also showed an eye-popping difference between the standard exhausts and all of the non-standard ones, with the standard exhaust noise levels weighing in at 72dB(A) and 73dB(A), and the non-standard exhausts varying between 77dB(A) – the best – to a torrid 92dB(A) on one test. That particular exhaust (which does not have a back box) hit a barely-believable 100dB(A) on a test that involved revving rapidly to 5000rpm.

The testing showed that the ISO 5130 test, which involves slow acceleration to a set speed, was best at differentiating between noise levels from different exhaust systems. The ISO 5130 method is preferred by the report because of its “standardisation and simplicity”.

The investigations showed that, when looking at the effect of load on differentiating between noise levels from different exhaust systems, under steady speed conditions this method was suitable provided that it focused on the fundamental firing frequency range, which is between 50 and 250Hz. “Compared with similar assessments carried out under no load conditions, noise levels of standard and non-standard exhaust systems were marginally easier to differentiate,” it notes.

It found, however, a poor correlation between the ISO 5130 stationary levels and type-approval drive-by noise levels but again, it is stressed that the ISO method is the only one that properly assesses exhaust noise problems.

The report suggests that an in-service roadside exhaust noise test would be a first step towards the goal of identifying noisy exhaust systems. If a test following the ISO type-approval stationary test methodology was adopted it would potentially provide information regarding the performance of exhaust systems on new vehicles.

However, the report cautions that “an extensive measurement programme would be required to collate information on how the acoustic performance of exhaust systems changes over time.”

It also notes that for an exhaust noise test to be applicable, supporting information is needed that describes the typical acoustic performance of standard exhausts over time. The authors suggest it would be possible to create a spreadsheet-type databank of exhaust noise levels that could be updated by enforcement agencies as roadside tests are undertaken, and indeed there is already a handy databank of noise emission levels for new vehicles based on ISO 5130.

A start? Certainly. Will the proposals catch or deter boy racers who want a noisy car? Unlikely.

● The reports are available from TRL, website www.trl.co.uk

UK acousticians would like to think they are smart but international delegates at the recent wind turbine conference in Denmark might not agree.

Indeed the UK was in danger of becoming a laughing stock, with wind sceptic Jane Davis asking an American expert whether he'd consider putting plastic bags on field microphones to keep them dry. This was met with derision.

Well it does happen here. Close reading of a recent high profile planning inspector's report into a wind farm suggests that it really did happen during measurement of background noise.

The wind lobby, fired up by its own self importance in terms of global warming benefits, really does seem unable to regain the initiative in the battle to win public hearts and minds, even among international experts.

More wind woes. There seems to be a whoopsee in another planning decision.

In this instance, a wind farm succeeded at Dewlay Cheese, with conditions. One condition read: "The noise of the wind turbine shall not exceed 5dBA above background noise at any wind speed and at any time of the day or night when

measured at any complaint location, subject to an upper limit of 43dBA at night time and an upper limit of 37.5dBA during the day."

You may need to read it again. It should say lower limit. Oops.

Congratulations to aircraft and noise protester John Stewart on his 60th! Well done also to the organisers of a surprise party for him that saw this wonderful birthday cake and spoof front page. All the best John!



NOISE EVENTS 2009 / 2010

28th July

THE CHANGING DESIGN OF SOUND LEVEL METERS AND THE BENEFITS OF DIGITAL TECHNOLOGY

Casella conference to be held in Bedford, IoA 01727 848195

23th-26th August

INTERNOISE 2009

to be held in Ottawa, website www.internoise2009.com

2nd-4th October

18TH ANNUAL INTERNATIONAL CONFERENCE ON 'TRAFFIC NOISE'

To be held in Dresden, Germany. More details www.persistence.nl/xnoise/fileadmin/user_upload/Calendar/TA_2009_engl.pdf

7th October

EPUK NOISE UPDATE

To be held at Aston Business School, Birmingham, contact Epuk, 01273 878 776

26th-28th October 2009

EURONOISE 2009

to be held in Edinburgh, website www.eurnoise2009.org.uk

2010

27th January

WIND TURBINE NOISE

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

29-30 April

NOISE IN THE BUILT ENVIRONMENT

Joint meeting of the IoA and the Belgian Acoustics Association (ABAV) to be held in Belgium, contact Linda Canty, 01727 848195

13th - 16th June

INTERNOISE 2010

to be held in Lisbon, Portugal

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