

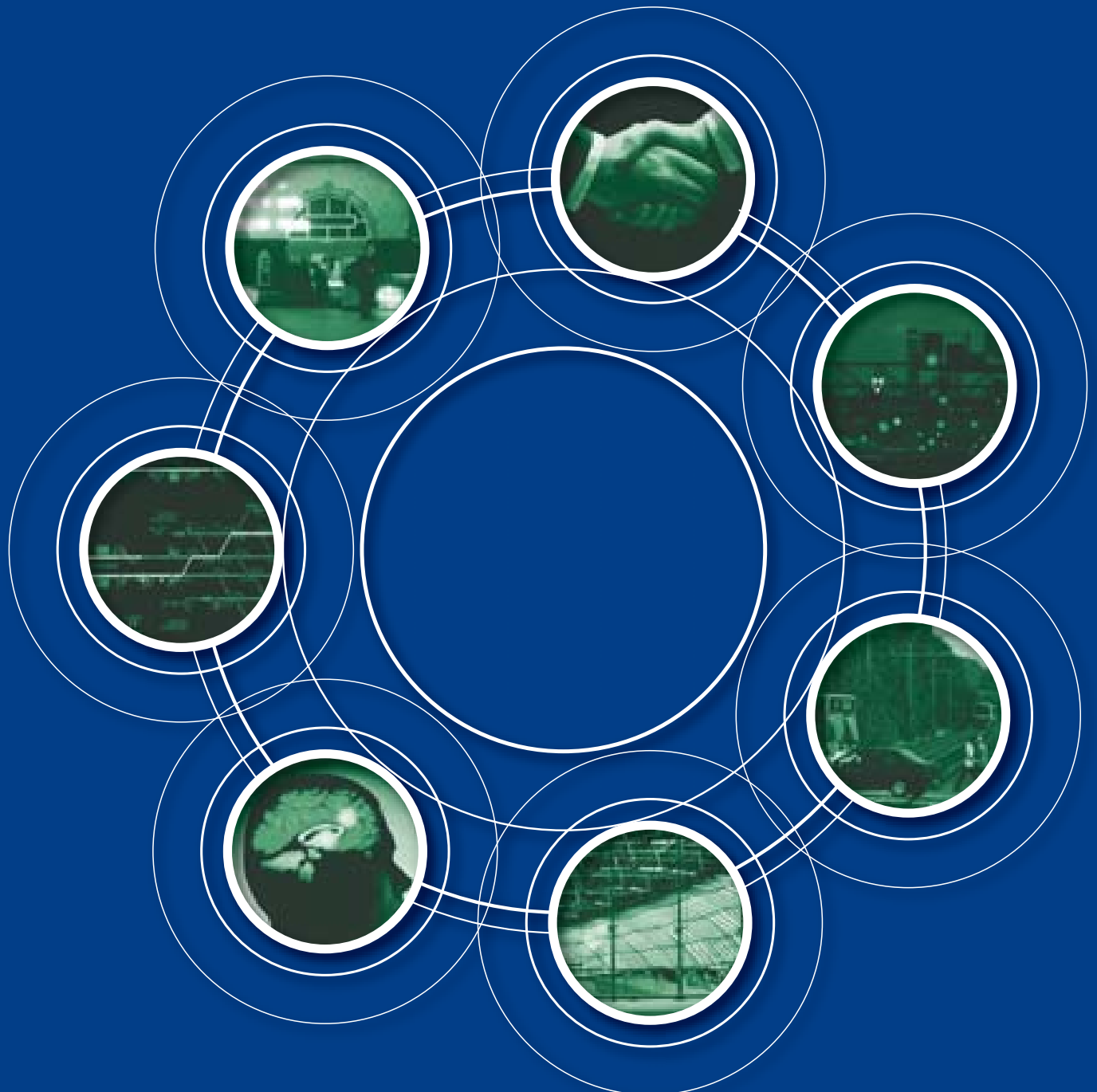


Rail Safety & Standards Board

Research Programme

Operations

T681 Understanding the problems that train horn noise causes to neighbours - Impact survey overview



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Train Horn Impact Survey Overview

This project note summarises the key findings from the survey reports in the three main study areas: Lingfield, Horsham and Canterbury. The results of the research in each of these locations are summarised in C2054-03, 04 and 05 respectively. The remaining data is documented separately.

Unless otherwise specified, in this overview we have used the version of the dataset which combines results from the 'zoned' postcodes in the three main survey locations. A question-by-question summary is included as Appendix A.

Research Programme

A preliminary study of 8 interviews was carried out at Bentley in Hampshire but the main purpose of the research was to assess the impact of train horn noise on a sample of trackside residents in the three main study areas.

The main research programme comprised a combination of face-to-face interviews and hand-delivered questionnaires. The focus was on those postcodes judged most likely to be seriously affected and the surrounding streets. Taken together, the interviews and questionnaires were intended to give at least 50% of households in these postcodes the chance to participate. In the 'zoned' postcodes we reached 1598 households through questionnaires or interviews of which 473 responded (30%). This is a good response rate given that there was no follow-up letter.

Main Conclusions

The main part of this project note comprises a report of the results of the survey, but it may be helpful first to summarise the main conclusions.

- Horns are heard over large distances and we estimate that well over a thousand households across the three study areas are being affected by train horn noise. The impact is not universal and some residents who are unaffected by train horn noise find it difficult to empathise with those who are.
- Of those affected, we estimate that several hundred across the three survey areas are suffering significant disruption. Sleep deprivation caused by train horn noise is reported to be widespread. The vast majority of respondents say that the impact is much worse since the new horns were introduced.
- Residents living closest to whistle boards state that their lives are being ruined and some experience chronic health effects.

- Most residents are asking for a return to the previously experienced levels (and frequency) rather than an end to their use. People generally do understand why horns are important, but believe that the health and quality of life impacts from the louder horns (or maybe any routine sounding of horns) are grossly disproportionate to any health and safety benefits.
- In affected areas, the industry is widely perceived to have introduced the new horns without considering their impact and then to have dismissed without investigation the many complaints it received.

The Zone Model

Average results were rarely meaningful because they do not fairly represent the impact on those most affected. We therefore grouped postcodes into four zones, depending on how respondents answered Question 2.6. If 80-100% of respondents said train horn noise was “annoying or very annoying” in their homes, that postcode was allocated to Zone 1. For Zones 2, 3 and 4 the corresponding percentages were 60-79%, 40-59%, and 0-39%.

When plotted on a map, these zones give an indication of where the most affected houses are (see area reports C2054-03, 04 and 05). In these maps, the very few postcodes with zero returns (mainly Horsham) are categorised as Zone 4.

Impact does not simply correlate with distance and the response of residents even within a small area varies hugely. Personal circumstances and sensitivity to noise pollution play a part, but local acoustic effects, building type, and local internal and external noise levels mean that the impact on any specific household cannot simply be inferred from a location on the map or zone allocation. Our perception is that the main underlying factors determining what zone the postcode falls into are:

- proximity to, and direction of, the nearest whistle board
- hard structures between homes and track or that reflect sound back across
- cuttings or embankments and the landscape between homes and track

The response patterns were similar across the three main survey areas so one might deduce that zones with a similar impact profile exist at other whistle board sites across the UK, given comparable train types, horn types and driver behaviour. However, local factors and irregular postcode mean that it is difficult to extract any underlying generic impact ‘footprint’ from the zone maps alone.

- Zone 1 postcodes are most likely to be within 50m of active whistle boards with little hard structure between home and railway.
- Zone 2 postcodes are most likely to be within 50 to 200m of the whistle board
- Zone 3 postcodes are most likely to be within 200 to 300m of the whistle board
- Zone 4 postcodes lie beyond 300m.

The theoretical noise maps prepared by Spectrum for this project¹ assume open ground whereas in reality buildings and bridges shield or reflect and therefore do not predict the level for individual buildings. Although the coverage was roughly equivalent in each study area, the level of annoyance dropped off much quicker in Horsham than Canterbury or Lingfield.

Almost all Zone 1 houses will be adversely impacted. Some will be more severely affected than others. Almost two thirds of Zone 1 respondents reported suffering from sleep deprivation and one third reported being regularly startled. A handful appear to suffer extreme problems. We cannot assume that all Zone 1 are affected to this degree - 13% of Zone 1 respondents did not think their health was affected, 24% said there was no impact on work or social life and 42% had not changed their lifestyle (though some of these might have done so if they could).

Linking survey results to model noise contours can only be speculation and there will not be a direct correspondence, but in terms of numbers the handful of houses which give the impression of extreme impacts corresponds broadly to the number encompassed by the notional 90db noise map contour. The number of severely impacted houses corresponds broadly to the number encompassed by the notional 80db noise map contour.

The notional 75db contour would generally encompass the whole of Zone 1, the 70db contour Zone 2 and the 65db contour Zone 3, but we have no data on the *actual* noise levels at these points. It seems likely for instance that the levels drop off more sharply in Horsham than the plots suggest. Also, horn noise foot prints are not actually circular. From our data, they seem more likely to be ellipses biased in the direction of travel, so we would need to consider our results alongside some actual horn footprints to make a more considered judgement about any generic models.

The noise from a heavy truck at 1m might be 90db; the noise at the curb of a busy street might be 80db, or 70db 5m away; an office environment might be 60db. These comparisons are useful but of course do not capture the additional impact of an impulse source.

Data Composition

As already explained, this project focussed on understanding the range of impacts and the area affected. It also formed part of the industry's programme to follow up complaints and a key objective was to capture the detailed views of people who had already contacted the industry directly or indirectly to complain about train horns.

We present results as a percentage of respondents but they are *not* the results from a random sample and they must not be used as if they were. They provide an indication, but only an indication, of the proportion of people affected within the four zones.

¹ T680 – Train Horn Noise Mapping - Canterbury NDT2210
T680 – Train Horn Noise Mapping - Horsham NDT2201
T680 – Train Horn Noise Mapping - Lingfield NDT2193

There is variability within the sample (which we discuss elsewhere) and there are methodological biases.

- We carried out two sets of interviews. The contact interviews were only with people who had already complained. For the door-to-door interviews we selected other houses in the same or comparable streets. This provides the comparison dataset requested by RSSB but it is not a random sample because it excludes those who had complained.
- Questionnaires were distributed as far as practicable to every house on those streets or parts of streets that we targeted, excluding households where someone had been interviewed. However, a further 26 were received from prior contacts (i.e. complainants) that had been specifically targeted.
- Response rate to door-to-door questionnaires depends on a wide range of factors (including level of annoyance) as discussed below under 'Complaints'.

Postcodes were allocated to zones on the basis of all responses, but the level of annoyance does differ between different response routes. The table below shows the percentage in each zone that rated train horn noise annoying or very annoying in the house, broken down to show the difference between the total sample in zoned areas (473 responses), the door-to-door questionnaires (362 responses), the door-to-door interviews (55 responses), and responses obtained from prior contacts/complainants by interview or questionnaire (56 responses).

| % | All responses | Door-to-door Questionnaires | Door-to-door Interviews | Contact Interviews/ Questionnaires |
|--|---------------|-----------------------------|-------------------------|------------------------------------|
| Zone 1 Defined as 80-100% annoyance | 90 | 88 | 71 | 100 |
| Zone 2 Defined as 60-80% annoyance | 70 | 77 | 40 | 100 |
| Zone 3 Defined as 40-60% annoyance | 53 | 52 | 33 | 78 |
| Zone 4 Defined as 0-40% annoyance | 19 | 17 | 27 | 67 |

Results have not been subject to any statistical analysis, tested for significance, or corrected for sample demographic profile in any way. This would give a false impression of rigour. However we do have some demographic information. Of the 612 respondents in the total database (not just zoned areas), 272 (44%) respondents gave incomplete information. The breakdown of results from the remainder is as follows.

| | | |
|--|-----|-----|
| • Family with small children (0-10) | 50 | 8% |
| • Family with teenage children (11-19) | 34 | 5% |
| • Family with teenage AND small children | 14 | 2% |
| • Family with children in 20s | 22 | 3% |
| • 20s / 30s - no children at home | 24 | 4% |
| • 40s / 50s - no children at home | 74 | 12% |
| • 60 or older – no children at home | 122 | 20% |

For comparison, 2001 census data suggest that 23% and 10% were 60 or over in the electoral wards covering the Lingfield and Horsham samples respectively.

Complaints

The noise level experienced even by near-neighbours varies and is hard to predict precisely. Responses show how complex the acoustics can be. Noise levels do not lie on tidy contours, but are affected by geography and particularly by intervening buildings etc. The impact on the individual also varies. Sometimes neighbours who appear to experience similar noise levels described the problems quite differently:

- People are not equally sensitive to horn noise and it affects their sleep differently.
- People start with different expectations of their environment, and some already live with different levels of ambient noise and noise pollution.
- Some houses offer better protection, though in the worst areas respondents say even double or triple glazing is little help.

People are not equally motivated to complain. Many residents who are affected by train horns – we deduce sometimes badly affected - have not complained and some did not even respond to our survey. From the comments made, our impression is that people were more likely to fill in questionnaires if (in no particular order) they:

- Held strong positive or (more usually) negative views about train horns.
- Were already aware of train horns as an issue, due to local media or campaigns, active neighbours etc.
- Had higher expectation of quality of life.
- Were less resigned to having to 'put up with it' and could see the possibility that getting involved would result in change.
- Were confident about filling in questionnaires or dealing with 'the authorities' and had the resources to do some research to support their arguments.
- Had the time to do so, for instance if they were retired.

Those who commented on complaint handling were generally happy with the efforts of MPs and RATH, who were thought to be generally sympathetic, but less so with councils and the HSE which were more often felt not to be acknowledging the extent of the potential impact. The industry generally provided an explanation that equated to rejection and this was not well received.

The outcome so far is presumably not satisfactory for most complainants, except in those places where whistle boards have been removed and the drivers have stopped sounding their horns. The current work and perceptions of a positive attitude within RSSB will have raised expectations – two thirds in the inner zone and over a half in the next two zones volunteered to assist with any follow-up work, which is a good response. If changes do not follow, a sense of being let down and general frustration will lead to greater support for those favouring a confrontational approach.

Perceptions of Train Horns

When asked how often they heard the horns, Horsham responses were evenly split between 0-3, 4-6 and 7-10 per hour, whereas Lingfield and Canterbury residents were split between 0-3 and 4-6 per hour. Reducing the number of horn soundings would not necessarily reduce the level of expressed annoyance, though it would no doubt be welcome.

Horns were most noticeable during early mornings, late nights and then evenings. Residents notice train horns more at weekends rather than weekdays, but approximately 20% of respondents stated simply “all the time”.

The first train of the day was heard before 6am by 28% in Zones 1 and 24% in Zone 2. Cumulatively, 77% in Zone 1 said they heard a horn by 7am, 68% in Zone 2, 52% in Zone 3 and 29% in Zone 4. We do not have any information as to whether they heard horns at these times occasionally or every day. Typically, across all zones 20-40% say they hear up to 3 an hour but a significant percentage say they hear more: 29% in Zone 1.

The percentage of respondents that had noticed a change in train horn noise was 85%, 68% and 70% in Lingfield, Horsham and Canterbury respectively. Many associated the change with the introduction of new trains with louder horns, but a significant number also said they believed horn usage had also increased.

Approximately 20% of respondents described the train horn noise as “variable” and 45% as “too loud”. 4% of respondents in Zones 1 and 2 described the train horn noise as quiet or not annoying, rising to 14% in Zone 3 and 31% in Zone 4.

There seems to be a great deal of variation in where, when and for how long drivers sounded their horns. This was a big issue for the nearer residents, who asked for more consideration - especially at night. We explored the potential causes of variability in a separate question. In Lingfield Zone 1, 57% of respondents said driver variation was a factor in the level of horn noise, 43% in Horsham and 72% in Canterbury. Other observations and noise measurements confirm that there is a lot of variation.

According to the Train Horns Steering Group briefing of July 12th 2006, whistle boards for five crossings within our Canterbury survey area have recently been removed. There are now none in Sturry, for example. However, the expected pattern of annoyance remains, which might be because people responded on the basis of past experience and/or because drivers still sound their horns at these crossings. Sturry residents estimated that 50% of drivers still sound their horns 2-3 months after whistle board removal. Some other respondents pointed out that the reverse also happens: drivers do not always sound horns even when whistle boards are present.

Information on local guidance to drivers is not in the public domain. Many residents seem frustrated that they cannot find out whether there really is a local night-time ban, whether only non-stopping trains should use their horns at whistle boards near stations etc.

We understand that different types of train offer the driver different levels of flexibility but more disciplined and sensitive use of the horn might bring significant relief. Some residents made a point of saying that they appreciated the difficult circumstances under which train drivers work.

Other Noise Nuisance

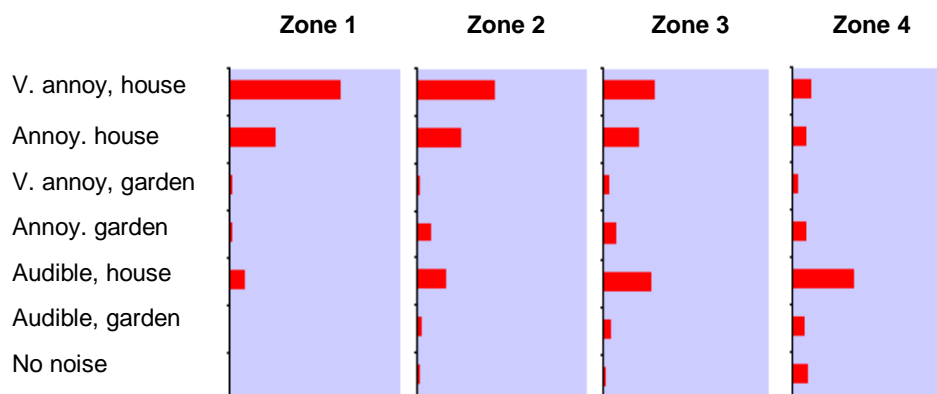
Lingfield is close to Gatwick and aircraft frequently pass relatively low overhead. Our understanding is that the noise from aircraft in Lingfield when they are taking off and landing in that direction is typically around 55-60db, equivalent to what one might expect in our Zone 4 from the horns.

49-88% of Lingfield respondents said aircraft noise was a nuisance. Other sources of nuisance were reported but they were less significant and/or the source was more localised: road noise in some parts of Lingfield; industry, roads, other track noise and students in Canterbury. In Horsham, most of the study area lay in quieter residential roads to the west and east of the railway but industrial noise affected some houses.

Residents found it difficult to compare different types of noise nuisance. Of those residents that did try, the majority found aircraft noise less annoying. Plane noise was "more gradual" and it was easier to become "used to it". There was, however, a minority who found aircraft noise more annoying. Presumably it depends on the relative loudness and individual circumstances.

Annoyance

Question 2.6 explored the level of annoyance amongst local residents. Zones 1 to 4 are defined against the results for this question and not by distance.



In describing their annoyance, residents used terms such as: aggravating, irritating, vexing, upsetting, raises blood pressure. Some residents report unintentionally swearing at the trains or shouting “shut up” every time they hear a train horn. One lady said “*we are going mad from train horns*”. Others expressed similar sentiments. Factors that were said to increase the level of annoyance included:

- Quality of life is impaired;
- Invasion of privacy / intrusion;
- Human rights are being infringed.

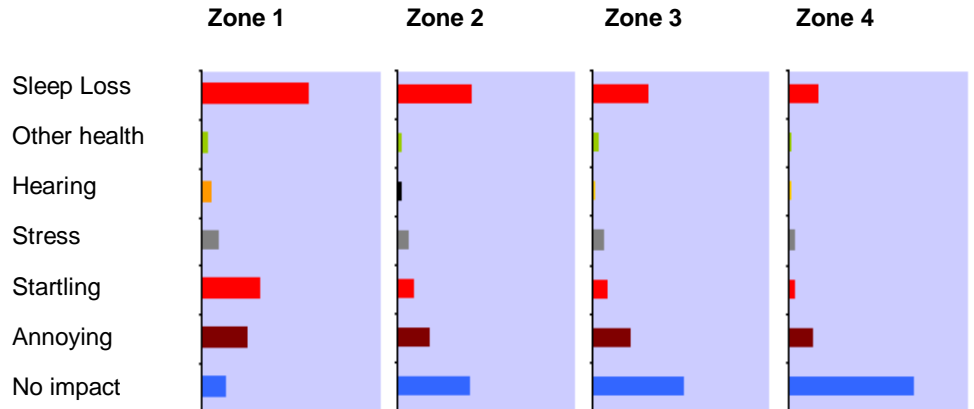
Annoyance was compounded by perceptions that ‘the railway’ is:

- behaving in an anti-social manner;
- outside the law;
- deliberately attempts to annoy residents (some drivers);
- delaying a solution to avoid costs;
- ‘not subject to health and safety requirements’.

Residents are annoyed not just at the horns themselves but at the frustration of not being in control of the situation and the inability of the railway authorities to sort out the problem. They are also annoyed at continually being asked to prove impact on health – including our survey.

Residents describe themselves as resentful and angry that time in the garden or family gatherings are spoilt by the noise pollution. They are aware that they have become bad-tempered, liable to snap and subject to mood swings. They wish that train drivers and managers from the railway industry could experience the noise for themselves day after day.

Sleep Loss and Health



A wide variety of answers were given to question 4.1, which asked whether residents believed train horn noise affected the health and well being of members of their household. These were categorised as shown above. In all zones, there were some who experienced no impact but nearer the whistle boards there is clearly a significant and widespread impact, particularly sleep loss.

Sleep Loss

As already mentioned, the first train horn of the day is heard before 6am by 28% in Zones 1 and 24% in Zone 2. Almost everybody says that the last horn is between 11.00pm and 01.00am.

13% of Zone 1 respondents said there was no impact on health and well-being, rising to 40% in Zone 2, 51% in Zone 3 and 69% of Zone 4. Health impacts are not therefore universal. The impact varies with location, individual sensitivity and life or work patterns.

However, sleep loss was a serious and very commonly reported problem. Across the whole of our dataset, over 1/3 of respondents – 230 people - complained of disturbed sleep, 209 of regular disturbance. The relationship between sleep loss and zone allocation illustrates the link between sleep disturbance and annoyance. 62% of Zone 1 respondents, 41% of Zone 2, 31% of Zone 3 and 16% of Zone 4 suffered sleep loss.

This is a substantial collective impact and there will be knock-on effects from sleep loss. Comments in questionnaires, interview notes and letters show people to be suffering genuine distress. Residents described how they are woken up by train horns and are unable to get back to sleep. They “*lie awake, waiting for the next horn noise, tired and angry*”. The knock on affects of sleep disturbance can impact of all areas of life. The whole family can become tired at work or school.

Residents point out that when one member of the family is tired due to sleep disturbance, he/she can become grumpy or bad-tempered and that affects other family members, who are in turn stressed and concerned about the worst-affected family member. In one interview, a wife described how she had become more inactive due to tiredness and had put on weight. The husband was upset at the impact on his wife.

Other residents described how they tried to get sufficient sleep by using ear plugs or altering their sleeping patterns. Some said that they had to spend longer to achieve a smaller amount of sleep which had an impact on leisure time. When they were able to sleep, the sleep was less refreshing due to the interruptions. Also, they were often woken up abruptly from deep sleep rather than being able to surface gradually. One respondent said that even in her sleep she cannot escape as she “*dreams of train horns*”.

Train horns make it difficult to catnap in the daytime to catch up on sleep. Some retired people described how they would previously doze in the daytime e.g. on summer afternoons, but are no longer able to. Respondents mentioned other factors that made the impact worse.

- Shift workers reported problems, particularly in the summer where it was difficult to shut windows due to the heat.
- People suffering from illness already suffer sleep disturbance. Horn noise made matters worse.
- Lingfield residents in particular described the cumulative sleep disturbance of multiple noise pollution i.e. traffic, planes and train horns.

Residents who describe fatigue, ongoing weariness or insomnia have in some instances sought treatment from doctors (in our full database, 2% of respondents that suffered sleep disturbance). One resident described the situation simply as “*losing sleep, losing health*”.

This note is not the place for a review of the literature, but we note that there are a number of authoritative studies of noise and sleep patterns available e.g. the Health Council of the Netherlands report². That report also includes a discussion of the appropriate treatment of impulse noise (p83). In the light of academic work in this area, the results of our survey do not seem surprising.

Other Health Effects

It has been as much as four years since the louder horns were introduced and the effect on those in the most affected houses - a subset of Zone 1 – is reported to go well beyond occasional sleep disturbance. The quality of life for these residents is usually seriously compromised and health impacts are reported. Some respondents included details of specific problems – sometimes serious - that they say have arisen as a result of train horn noise. A few even provided copies of correspondence from medical consultants.

In the closest houses, horn noise is almost certain to be loud and startling; 33% of Zone 1 respondents described it in these terms. Train horn noise is most alarming to those who are not used to it, such as visitors. Residents feel obliged, when they notice distant horns, to warn guests that there may be a near horn noise. Train horn noise can also be extremely alarming to small children.

² The Influence of Night-time Noise on Sleep and Health. Health Council of the Netherlands. U 1007/WP/718-K, July 2004.

Many residents consider that abnormal frequent and loud noises must have a long-term impact upon health. Some tell of accidents that have happened as a result and descriptions of the noise included: frightening, upsetting, disturbing, nerve-shredding, physically/mentally assaulting, heart stopping, peace-shattering, torture, aggressive, terrifying, and unnerving. It was put to us that this was to be expected since the horn noise is designed to trigger an immediate 'flight or fight' type of response.

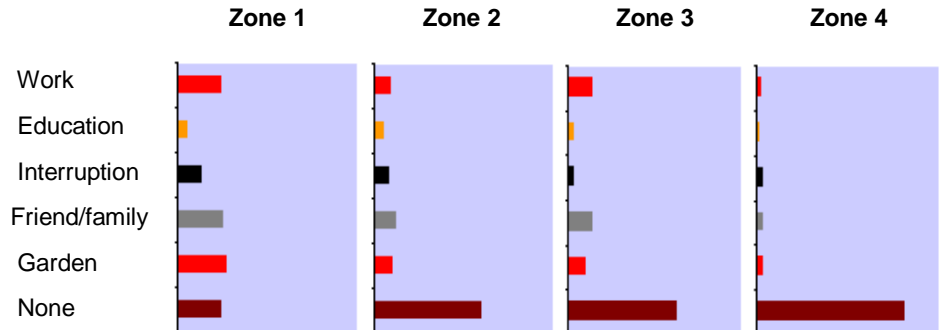
A significant proportion of respondents specifically used the word stress and others described the annoyance they felt or health effects in ways that were suggestive of stress. Stress seemed linked to a sense of powerlessness and perceived lack of progress in resolving the issue. Cumulative impact and sleep loss coupled with a sense of helplessness have a bigger impact than one-off events.

Many residents said that they felt their home life was spoilt: "*Your home and garden should be peaceful and relaxing, not unsettling*". Anxiety at this infringement of their personal space leads to stress. A comment from one resident best indicates the depth of feeling: "*It is so loud it eats into you, we could cry in despair – I hate these d****d trains*".

Symptoms of stress as described by residents included an inability to focus, concentrate or think clearly. One resident mentioned how she needs regular massages in order to better cope. Another felt that she was drinking more than she ought as a direct result of the horn noise. A number of residents attributed the onset of depression to the aggregated impacts of train horn noise.

These impacts are experienced by a proportion of the population which appears to vary generally in line with noise level. However, a few residents, particularly those further away, liked the horn noise. Some residents close to crossings were aware of careless use and occasional near misses, and of the consequent potential for an accident. A resident close to a crossing said that for this reason she felt stressed when the horn was *not* used.

Quality of Life



A less clear cut picture emerges from analysis of free text answers on more general quality of life impacts.

Roughly a quarter of those in Zone 1 said that these effects had an impact on their work, life with friends and family and enjoyment of the garden, with smaller percentages mentioning other impacts. Feeling unable to invite friends and family to the house seemed particularly important to some. Again, one might speculate that for the closest houses the impact might be very significant but would reduce with noise level. 24% in Zone 1 said there was no impact on work, education or social life, rising to 59% in Zone 2, 62% in Zone 3 and 80% of Zone 4.

Around half the respondents in Zone 1 closed windows to avoid noise, a quarter avoided the garden. A little under a quarter had fitted double glazing, though perhaps not exclusively to deal with horn noise.

A majority in the survey area did not make any changes to lifestyle, 42% in Zone 1 rising to 64% in Zone 2, 69% in Zone 3 and 82% of Zone 4. Even if they wished to do so, some might not be in a position to make changes. Those most affected use phrases like 'all pervasive'; there might not be any change that would reduce the problem to an acceptable level.

Many of those affected seemed to feel strongly that they would not have lifestyle changes imposed upon them and that the railway authorities should solve the problem at source.

Property Value

There are approaches that seek to value health and quality of life impacts but, judging by some comments made by the more seriously affected residents in particular, their application may prove controversial and would have to be handled with care. Residents were, however, generally happy to talk about the perceived impact of horn noise on house prices.

The impression we get from discussions with estate agents is that there is an effect if a house is very close to the railway line. They did not confirm a percentage but the comments we do have are not inconsistent with the figure of 10% often quoted in international studies for houses backing onto a railway.

The Oslo study found a 20-27% greater price impact for detached houses than for apartments³. People are perhaps less likely to focus on horn noise where aircraft or traffic noise is more intrusive so the picture may be more complex in Lingfield. The buy-to-let market is traditionally less sensitive, for example in student areas of Canterbury.

Houses very close to the whistle boards suffer a significant extra impact, so one might expect to see this reflected in a further price reduction. Agents did not confirm it and one noted that houses in one of the worst affected areas actually sold quickly – houses within easy walking distance of a station generally did sell well. However, a significant number of residents reported major problems selling and some provided detailed information to support their arguments. In our survey, 72% of those in the most affected postcodes thought there was an impact, falling to 16% in the least affected postcodes

Using Crossings

The reason for whistle boards is to provide people using foot crossings with warning of approaching trains. Questions were included to obtain information to help with risk analysis. The proportion of respondents that said they used the crossings was quite high. Overall the percentage did not vary much across the zones (55-59%) but as expected there were marked local differences in crossing use.

When discussing their own use of crossings (residents across all zones in zoned areas):

- 10% of residents indicate that they find train horns useful when using pedestrian rail crossings. However, 7% emphasised that horns are not useful.

When discussing potential changes to train horn use at crossings (residents across all zones in zoned areas):

- 36% of residents feel that train horn use could be stopped immediately
- 27% of residents feel that other forms of pedestrian control could replace train horn use
- 12% of residents feel that train horns are the best warning method

Those who suffer most from horn noise are more likely to make the point that horns are *not* useful but overall roughly equivalent numbers *do* find train horn noise useful as an aid in crossing the line. Some lack of confidence in train horns as a warning seems to stem from driver variation.

³ For a review of this and other studies see: Ståle Navrud. The State-Of-The-Art on Economic Valuation of Noise. Final Report to European Commission DG Environment. Agricultural University of Norway, April 14th 2002.

Preferred Solutions

When asked about solutions in terms of a preference between volume reduction and night-time ban:

- Reduced volume was a strong preference across all zones (58%). Night bans were more popular further out than they were close to whistle boards (17%).
- Some (mostly in Zones 1 and 2) were unable to decide between the two options, and in some cases were cross at being asked to do so.
- Some (mostly in Zones 3 & 4) said no changes to train horn noise were required.

Free-text comments were analysed and offer some additional insights. The following draws on the full data set, not just the zoned parts of the three main survey areas.

104 respondents (17% of the full data set) said they were not concerned about train horns and did not see a need for them to be changed. Of these, 6 households found train horn noise annoying but were prepared to put up with it because they considered it necessary for health and safety.

101 respondents (16%) added comments expanding on their preference for reduced volume. Residents may find that a return to old horn volume does not give the benefits anticipated due to increased usage in recent years. Some residents feared that volume reduction might mean that horns needed to be sounded closer to crossings (and possibly residential areas) and/or might need to be sounded more often.

62 respondents (10%) added comments expanding on their preference for simply stopping using the horns or having both a night time ban and reduced volume. 2% provided detailed comments on night time bans, 11% on changes to driver usage or reduced usage.

Closing remarks

Horns are heard over large distances and, although many of those that hear them are largely unaffected, a significant proportion is nevertheless suffering significant disruption and there is a considerable amount of annoyance within the community.

Some people are more disposed to complain than others, but on the basis of our work there seems little doubt that the impacts are real. Sleep deprivation caused by train horn noise, particularly since the new trains were introduced, is reported to be widespread and some of those living closest to the whistle boards report that they are being driven to desperation.

Now that the survey work has been done, the assumption seems to be that action should follow and that there is no reason for the industry to delay. We suggest that quick feedback to those who participated is essential.

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Appendix A: Detailed Results

The results are presented below for the three zoned areas, generally in the order that the corresponding questions appear in the report.

The data tables and graphs should generally be self-explanatory, but the following notes apply.

- Where a graphic is useful in illustrating the data, it is provided for the tabulated results.
- Results are expressed as a percentage of respondents.
- The percentage that did not answer (DNA) the question is given where appropriate.

Contact

Section 1 of the questionnaire asked for postcode, residents' contact details and availability for follow-up work.

Q1.2 Are you willing to participate in any potential follow-up work?



| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|---------------------|--------|--------|--------|--------|
| Avail for follow-up | 65 | 55 | 54 | 30 |
| Not available | 11 | 17 | 13 | 10 |
| Anonymous | 24 | 28 | 34 | 59 |

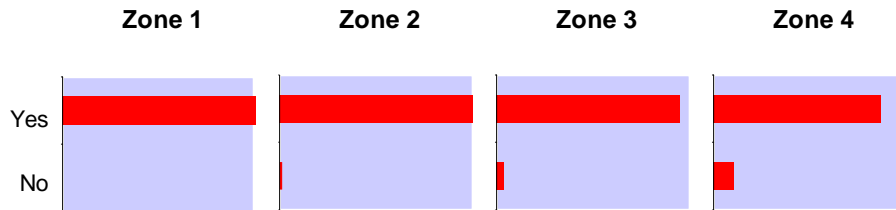
Notes

- Where a respondent replied anonymously, it is assumed they do not wish to participate in follow-up work.
- Where a named respondent did not answer the follow-up question, it is assumed they do not wish to participate in follow-up work.

Questions on Train Horn Noise

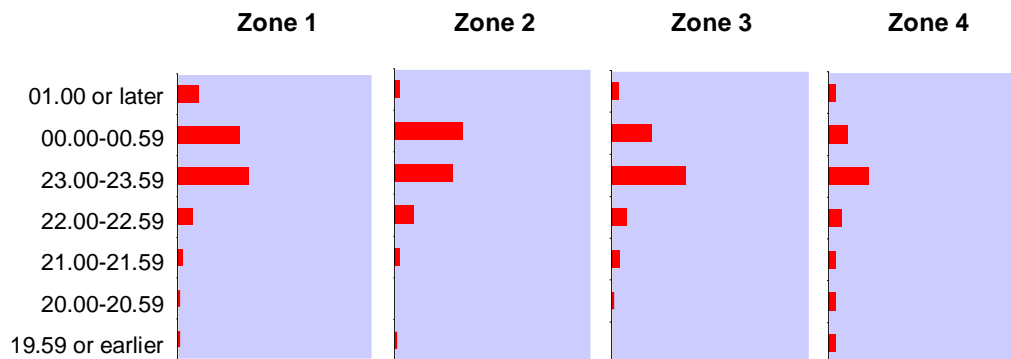
Section 2 of the questionnaire covered the extent to which residents heard and were annoyed by train horns.

Q2.1 Can train horn noise be heard from your home?



| % | | | | |
|-----|--------|--------|--------|--------|
| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
| Yes | 100 | 99 | 94 | 86 |
| No | 0 | 1 | 3 | 10 |
| DNA | 0 | 1 | 3 | 3 |

Q2.2 At what time do you hear the last train horn noise of the night?

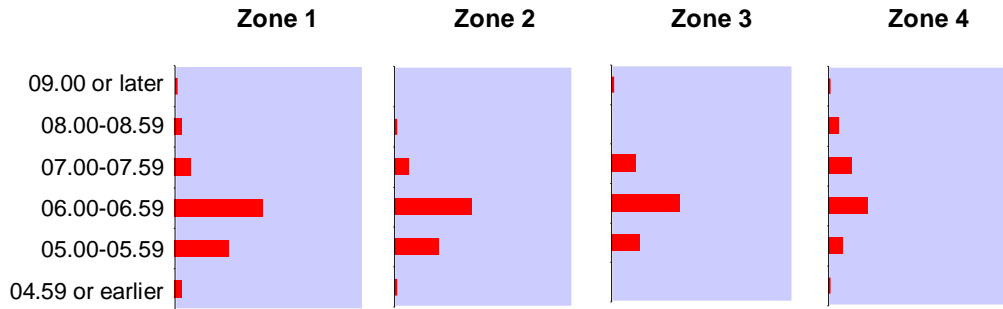


| % | | | | |
|------------------|--------|--------|--------|--------|
| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
| 01.00 or later | 10 | 2 | 3 | 3 |
| 00.00-00.59 | 31 | 34 | 20 | 9 |
| 23.00-23.59 | 36 | 29 | 37 | 20 |
| 22.00-22.59 | 7 | 9 | 7 | 6 |
| 21.00-21.59 | 2 | 2 | 4 | 3 |
| 20.00-20.59 | 1 | 0 | 1 | 3 |
| 19.59 or earlier | 1 | 1 | 0 | 3 |
| Variable | 5 | 6 | 4 | 6 |
| Don't know | 1 | 9 | 17 | 20 |
| DNA | 7 | 9 | 7 | 28 |

Notes

- Respondents provided a free-text answer to this question.
- Where the respondent provided a time range, the latest time is used.
- Other – this category includes non-specific answers such as “Varies”, “When in garden”, “When I fall asleep”..

Q2.3 At what time do you hear the first morning train horn noise?

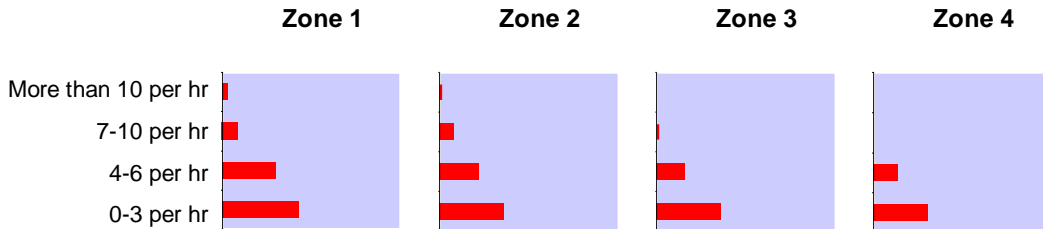


| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------------|--------|--------|--------|--------|
| 09.00 or later | 1 | 0 | 1 | 1 |
| 08.00-08.59 | 3 | 1 | 0 | 5 |
| 07.00-07.59 | 8 | 7 | 13 | 12 |
| 06.00-06.59 | 46 | 43 | 37 | 21 |
| 05.00-05.59 | 28 | 24 | 15 | 7 |
| 04.59 or earlier | 3 | 1 | 0 | 1 |
| Variable | 3 | 6 | 4 | 4 |
| Don't know | 3 | 9 | 15 | 20 |
| DNA | 6 | 11 | 14 | 29 |

Notes

- Respondents provided a free-text answer to this question.
- Where the respondent provided a time range, the earliest time is used.
- Other – this category includes non-specific answers such as “Varies, “When outside”, “When I wake up”.

Q2.4 How often do you hear train noise during the daytime?



| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|---------------------|--------|--------|--------|--------|
| more than 10 per hr | 2 | 1 | 0 | 0 |
| 7-10 per hr | 8 | 7 | 1 | 0 |
| 4-6 per hr | 29 | 21 | 15 | 13 |
| 0-3 per hr | 42 | 35 | 35 | 29 |
| Other | 11 | 13 | 17 | 12 |
| Don't know | 5 | 15 | 17 | 21 |
| DNA | 4 | 8 | 14 | 25 |

Notes

- Respondents provided a free-text answer to this question.
- Where respondent provided a range of frequencies, maximum frequency is used.
- Don't know - includes a variety of answers ranging from 'Don't know - at work all day', to, 'Don't know - we've got used to it'
- Other - includes non-specific answers such as “When in garden”.

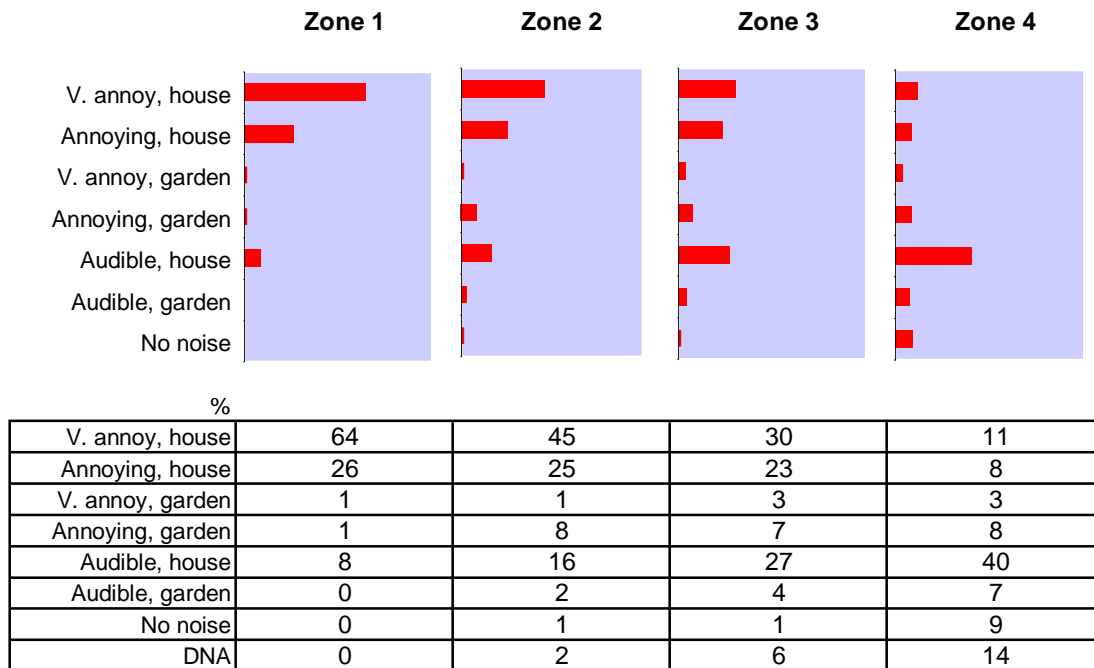
Q2.5 During which periods of the day/days of the week is train horn noise most noticeable?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-----------------|--------|--------|--------|--------|
| % | | | | |
| All the time | 23 | 21 | 21 | 9 |
| Weekends | 16 | 15 | 10 | 9 |
| Weekdays | 6 | 7 | 7 | 3 |
| Rush hour | 6 | 4 | 1 | 1 |
| Night | 34 | 30 | 20 | 16 |
| Evening | 21 | 28 | 20 | 13 |
| Afternoon | 4 | 3 | 7 | 9 |
| Morning | 35 | 30 | 25 | 18 |
| Garden/outside | 7 | 8 | 10 | 9 |
| Does not bother | 0 | 2 | 4 | 5 |
| Other | 4 | 6 | 11 | 9 |
| Don't know | 0 | 1 | 3 | 3 |
| DNA | 10 | 9 | 7 | 28 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible for this question.
- Other – includes non-specific responses such as “No pattern”.

Q2.6 Which areas of your home or garden are affected by train horn noise?



Notes

- Where the respondent provided multiple answers per area of house, eg, Annoying-Very Annoying, the most affected answer is used
- The categories represent the most severe of the impacts reported (as ranked above).
- Zones 1 to 4 are defined against the results for this question and not by distance. This chart therefore illustrates the variation within a zone.

Q2.7 Please describe the train horn noise (eg, volume, tone, duration):

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------------------|--------|--------|--------|--------|
| % | | | | |
| Quiet/not annoying | 4 | 5 | 14 | 31 |
| Short | 3 | 14 | 3 | 10 |
| Variable length/volume | 29 | 18 | 20 | 9 |
| Two-tone | 17 | 24 | 20 | 15 |
| Long | 15 | 11 | 13 | 9 |
| Loud/annoying | 52 | 58 | 45 | 28 |
| Other | 5 | 6 | 10 | 12 |
| DNA | 11 | 11 | 8 | 11 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Other – includes non-specific answers such as “Sounds like a train horn”, “In the distance”.

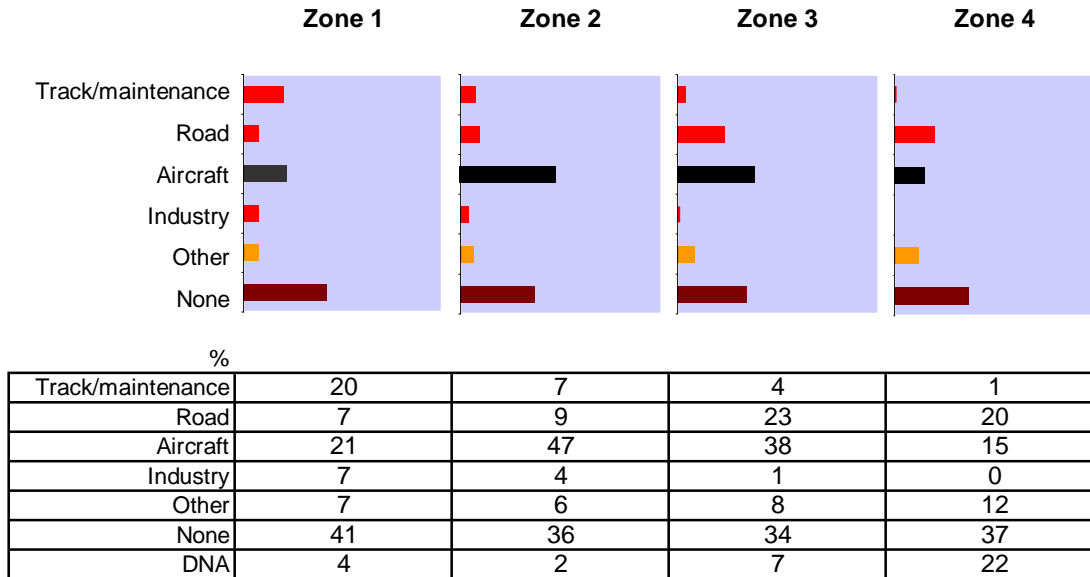
Q2.8 Please describe the how the train horn noise varies (eg, driver use of horn, train types, direction of travel, wind direction):

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|--------------------|--------|--------|--------|--------|
| % | | | | |
| Train type | 4 | 3 | 3 | 2 |
| Driver variation | 61 | 41 | 25 | 18 |
| Wind direction | 3 | 22 | 20 | 26 |
| Atmos. conditions | 1 | 4 | 3 | 3 |
| Travel direction | 12 | 9 | 1 | 3 |
| Variation (unspec) | 4 | 6 | 3 | 5 |
| No variation | 7 | 12 | 11 | 2 |
| Don't know | 2 | 2 | 6 | 6 |
| DNA | 17 | 22 | 39 | 48 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Variation (unspecified) – includes non-specific answers such as ‘Varies but not sure why’

Q2.9 Do you experience any other noise nuisance in your home?



Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Other – includes localised noise pollution, eg, shooting ranges, pubs, neighbours and other noise sources not otherwise categorized.

Respondents were invited to comment on these noise sources relative to train horns i.e. whether they were more or less significant. Relatively few did so, but the results are tabulated below.

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-----------------|--------|--------|--------|--------|
| Track - same | 0 | 1 | 0 | 0 |
| Track - more | 0 | 0 | 0 | 0 |
| Track - less | 6 | 2 | 3 | 0 |
| Road - same | 0 | 1 | 1 | 0 |
| Road - more | 0 | 2 | 6 | 9 |
| Road - less | 3 | 3 | 7 | 3 |
| Aircraft - same | 1 | 2 | 1 | 1 |
| Aircraft - more | 0 | 10 | 11 | 4 |
| Aircraft - less | 13 | 19 | 18 | 7 |
| Industry - same | 1 | 0 | 0 | 0 |
| Industry - more | 0 | 1 | 1 | 0 |
| Industry - less | 3 | 1 | 0 | 0 |

Questions on History

Section 3 explored people's perception of changes to the volume and use of train horns. It also gave an opportunity for feedback on the industry's complaints handling.

Q3.1 How many years have you lived in your current home?

Q3.2 Has the pattern of train noise changed with time?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|---------------------|--------|--------|--------|--------|
| % | | | | |
| Yes - Res >3 years | 77 | 74 | 66 | 54 |
| Yes - Res <=3 years | 7 | 10 | 6 | 2 |
| No - Res >3 years | 2 | 5 | 7 | 8 |
| No - Res <=3 years | 14 | 8 | 8 | 9 |
| Don't know | 0 | 0 | 3 | 3 |
| DNA | 0 | 5 | 9 | 24 |

Notes

- Respondents provided a free-text answer to Q3.2.
- The answers to these questions are combined to identify over what time frame the respondent may have been aware of train horn noise.
- The vast majority of respondents who had noticed change in train horn noise suggested that train horn noise has increased.
- Most respondents were unsure of the time-frame and cause but were just aware that they heard louder horns more often. Many associated the change with the introduction of new trains.

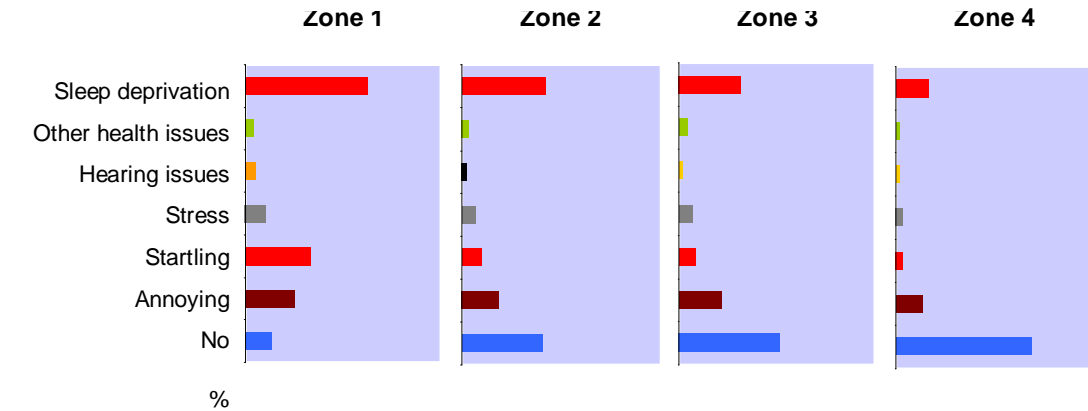
Q3.3 Have you complained about train horn noise?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-------------------|--------|--------|--------|--------|
| % | | | | |
| Media | 3 | 2 | 3 | 0 |
| Local petition | 12 | 2 | 3 | 1 |
| NAS | 3 | 2 | 1 | 1 |
| RATH | 7 | 1 | 4 | 2 |
| MP | 20 | 7 | 13 | 0 |
| Council (various) | 10 | 7 | 4 | 3 |
| RSSB | 4 | 4 | 7 | 2 |
| Network Rail | 4 | 4 | 4 | 1 |
| Operators | 13 | 7 | 8 | 3 |
| Station staff | 1 | 2 | 1 | 0 |
| Yes (Other) | 4 | 7 | 4 | 1 |
| No | 46 | 68 | 72 | 84 |
| DNA | 4 | 2 | 1 | 6 |

Questions on Impact

Section 4 of the questionnaire explored people's perception of the impact of train horn noise on them.

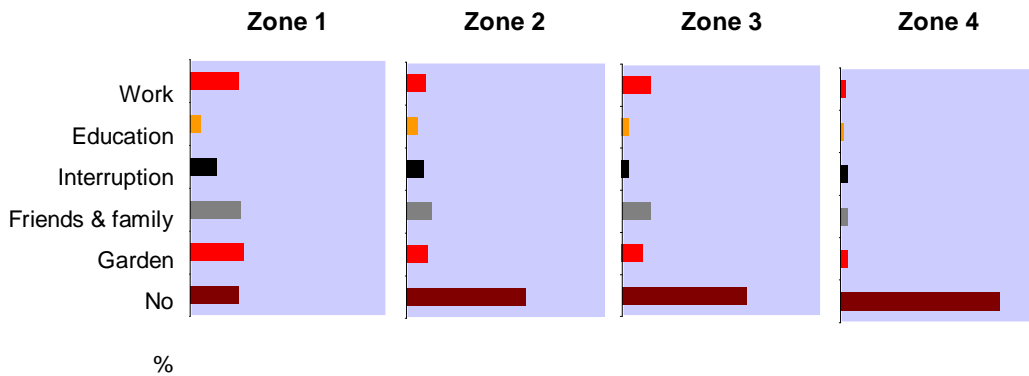
Q4.1 Do you believe train horn noise affects the health and well being of members of your household?



Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Where the respondent ticked No to health impact, but nevertheless listed health effects, these health effects are included in the results.
- Other health issues - includes health impacts not categorised separately and respondents who ticked yes to health impact but provided no further details.
- Hearing issues – includes respondents who attribute the onset of hearing problems to train horn noise and also respondents where a pre-existing hearing problem is exacerbated by train horn noise.
- Some respondents provided copy correspondence from medical consultants.

Q4.2 Do you believe train horn noise affects the work, education or social life of members of your household?



| % | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------------|--------|--------|--------|--------|
| Work | 24 | 9 | 14 | 2 |
| Education | 5 | 5 | 3 | 1 |
| Interruption | 13 | 8 | 3 | 3 |
| Friends & family | 25 | 12 | 14 | 3 |
| Garden | 27 | 10 | 10 | 3 |
| No | 24 | 59 | 62 | 80 |
| Yes (Other) | 12 | 11 | 4 | 4 |
| Don't know | 0 | 1 | 0 | 0 |
| DNA | 5 | 2 | 3 | 5 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Where the respondent ticked No, but nevertheless listed work/education/social effects, these effects are included in the results.
- Many respondents made the point that the sleep deprivation highlighted by question 4.1 has a knock-on affect in all areas of life.
- Work impact – this includes those respondents who indicated they suffer tiredness at work, they work at home and are interrupted by train horn noise, or those who work shifts and suffer particularly from trying to sleep at times of loud and frequent train horn noise.
- Education impact – this includes those respondents who indicated they suffer tiredness at school or college, or those that find it difficult to study at home.
- Interruption – includes interruptions to phone calls, TV and radio.
- Yes/Other – includes those respondents who ticked Yes to work etc impact, but provided no further details.

Q4.3 Please describe if / how different members of the household are affected differently

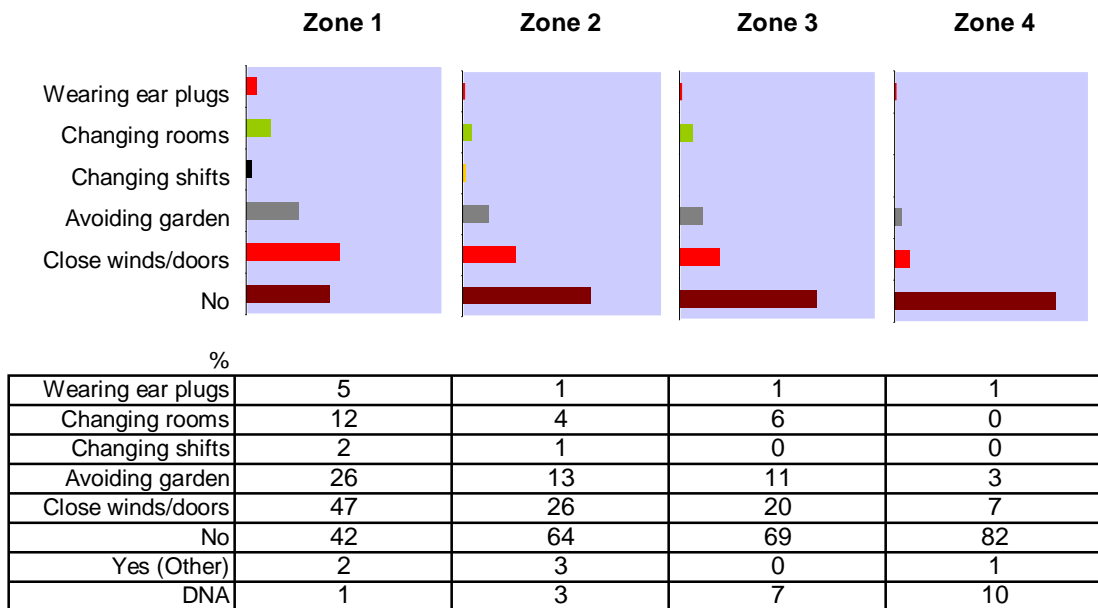
The answers to this question are not presented separately. The answers were combined into questions 4.1 (health), 4.2 (work/education/social life) and 4.3 (lifestyle). The question was designed to ensure that

- (a) the individual completing the questionnaire included effect of train horn noise on all the members of the household
- (b) a good demographic mix of respondents was obtained.

Note

- All results are presented by household not by resident. For instance, if the wife and the husband both suffer sleep deprivation and stress, the household is deemed to suffer both sleep deprivation and stress. If the wife suffers sleep deprivation and the husband suffers stress, the household is categorised identically.

Q4.4 Have you or your household changed your lifestyle to limit the impact of train horn noise? (eg, utilising other rooms, altering work shifts, changing sleep patterns, closing windows, avoiding the garden):



Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Where the respondent ticked No, but nevertheless listed lifestyle impacts, these impacts are included in the results.
- Yes/Other – includes those respondents who ticked Yes to lifestyle impact, but provided no further details.
- No – includes respondents who feel that lifestyle changes are not effective in limiting the impact of train horn noise.

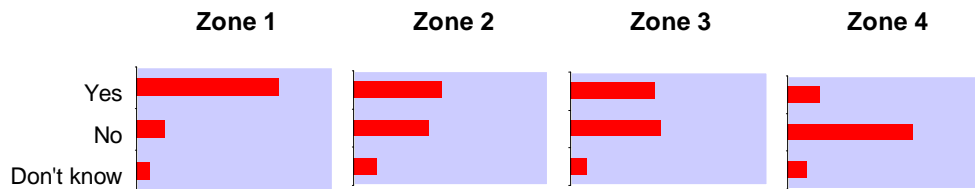
Q4.5 Have you (or previous occupants) altered the structure of the house in a way that reduces the impact of train horn noise? (eg, double-glazing, landscaping, walls, roof):

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|---------------------|--------|--------|--------|--------|
| % | | | | |
| Already d-glazed | 4 | 3 | 4 | 3 |
| Double-glazing | 22 | 13 | 6 | 6 |
| Secondary-glazing | 2 | 0 | 0 | 0 |
| Triple-glazing | 3 | 0 | 0 | 0 |
| Garden struct/plant | 4 | 1 | 0 | 1 |
| No | 60 | 78 | 76 | 70 |
| Yes (Other) | 5 | 1 | 1 | 0 |
| DNA | 3 | 5 | 13 | 20 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- Changing the structure of the property in a way that reduces the impact does not necessarily mean that this was the main or only driver for that change.
- Yes/Other – includes those respondents who ticked Yes to property alteration, but provided no further details.
- Of the respondents who answered No:
 - (a) some stated that properties had been built from new with double-glazing but that this had little effect in reducing the impact of train horn noise
 - (b) other respondents would like to install double-glazing, but are unable to for some reason: listed properties, cost etc.
- DNA – includes among others respondents who were renting and were unable to answer the question.

Q4.6 Do you believe train horn noise affects your property value? If yes, indicate the impact.



| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------|--------|--------|--------|--------|
| % | | | | |
| Yes | 72 | 45 | 42 | 16 |
| No | 14 | 38 | 45 | 63 |
| Don't know | 6 | 11 | 8 | 9 |
| DNA | 7 | 6 | 4 | 12 |

Notes

- DNA – includes among others respondents who were renting and were unable to answer the question.
- Some residents provided estimates of financial impact.

Questions on Crossings

The reason for whistle boards is to provide people using foot crossings with warning of approaching trains. Section 5 of the questionnaire was included to obtain information to help with risk analysis.

Q5.1 Do you use the foot paths that cross the railway line nearby?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-----|--------|--------|--------|--------|
| % | | | | |
| Yes | 59 | 65 | 55 | 55 |
| No | 39 | 33 | 39 | 34 |
| DNA | 2 | 2 | 6 | 10 |

If yes, please describe how you decide whether it is safe to cross the line?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-------------------------|--------|--------|--------|--------|
| % | | | | |
| Train horns | 7 | 10 | 10 | 9 |
| Train times | 3 | 3 | 6 | 1 |
| Train noise/vibrate | 34 | 32 | 27 | 22 |
| Visual/watch for train | 50 | 55 | 52 | 38 |
| Signals/barriers | 12 | 12 | 6 | 16 |
| Horns <u>NOT</u> useful | 10 | 5 | 13 | 4 |

Questions on Future Options

The final section of the questionnaire seeks residents' opinion on the best option for resolving problems with train horn noise.

Q6.1a Do you believe it is safe to stop the use of train horns in the vicinity of local crossings without changes to pedestrian controls?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------|--------|--------|--------|--------|
| Y | | | | |
| N | | | | |
| % | | | | |
| Yes | 46 | 40 | 37 | 23 |
| No | 40 | 49 | 45 | 59 |
| Don't know | 8 | 4 | 6 | 3 |
| DNA | 5 | 7 | 13 | 15 |

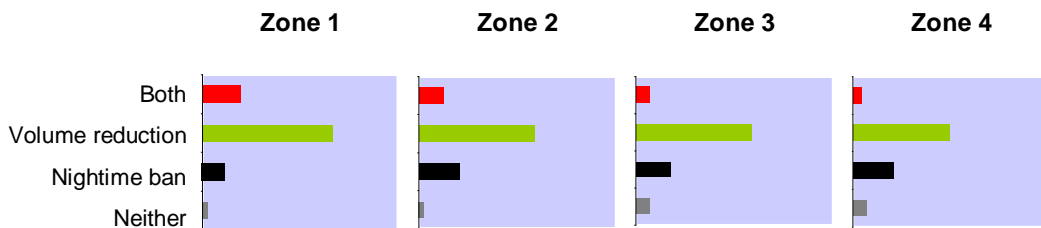
If No, are there any pedestrian controls that would make it safe?

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|-----------------|--------|--------|--------|--------|
| % | | | | |
| Horns necessary | 9 | 14 | 11 | 15 |
| Audible | 7 | 2 | 4 | 2 |
| Lights | 14 | 14 | 17 | 12 |
| Auto-gates | 4 | 6 | 6 | 6 |
| Bridge/tunnel | 4 | 3 | 1 | 4 |
| Close crossing | 2 | 1 | 1 | 4 |
| No (Other) | 12 | 17 | 13 | 23 |

Notes

- Respondents provided free-text answers to this question - multiple answers are possible.
- No/other answer – includes respondents who feel train horns are needed, and were unable to suggest alternative pedestrian controls to make the crossings safe without train horns.
- Horns necessary – includes respondents who feel that train horns are needed. However, many felt that a lower volume horn would provide equally as good warning.

Q 6.2 Other solutions are being considered. Which of these is more important to you: night time ban or reduction in horn volume?



| | Zone 1 | Zone 2 | Zone 3 | Zone 4 |
|------------------|--------|--------|--------|--------|
| % | | | | |
| Both | 19 | 12 | 6 | 4 |
| Volume reduction | 66 | 58 | 58 | 49 |
| Nighttime ban | 11 | 20 | 17 | 20 |
| Neither | 2 | 2 | 6 | 6 |
| Don't know | 2 | 0 | 6 | 1 |
| DNA | 1 | 7 | 8 | 20 |

Notes

- Both – some respondents were unable to decide between the two options.
- Neither – some respondents were adamant that no changes to train horn noise were required.

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