



Department
for Environment
Food & Rural Affairs

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Draft Noise Action Plan: Railways (Including Major Railways)

**Environmental Noise (England) Regulations 2006,
as amended**

July 2013

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Executive summary

This Action Plan has been developed by the Department for Environment, Food and Rural Affairs (Defra) as the Competent Authority for preparing and adopting this Action Plan under the terms of the Environmental Noise (England) Regulations 2006, as amended ('the Regulations'). The Regulations implement the Environmental Noise Directive (END) in England.

The END requires, on a five year cycle:

- The determination, through noise mapping, of exposure to environmental noise from major sources of road, rail and aircraft noise and in urban areas (known as agglomerations).
- Provision of information to the public on environmental noise and its effects.
- Adoption of Action Plans, based upon the noise mapping results, which are designed to manage environmental noise and its effects, including noise reduction if necessary.
- Preservation of environmental noise quality where it is good, particularly in urban areas.

This Action Plan applies to noise from railway sources that were covered by the second round of strategic noise mapping, undertaken during 2012. It accompanies two additional Action Plans, which are being published at the same time, covering the management of noise within agglomerations and from road sources. Responsibility for preparing airport Noise Action Plans rests with the relevant airport operators.

In line with the Government's policy on noise, this Action Plan aims to promote good health and good quality of life (wellbeing) through the effective management of noise. It is intended that this Action Plan will assist the management of environmental noise in the context of Government policy on sustainable development¹.

This Action Plan will be of relevance to rail authorities, local authorities including those with environmental, transport and planning responsibilities, and interested members of the public.

The END requires that Member States consult with the public about proposals for their Action Plans. This Action Plan will be subject to public consultation between July and October 2013.

¹ Sustainable development means encouraging economic growth while protecting the environment and improving our quality of life - all without affecting the ability of future generations to do the same.

It has been estimated that the approximate number of people associated with the Important Areas (noise 'hotspots') identified through the process described in this Action Plan for the major railways outside agglomerations is just under 4,000. This is expected to correspond to just over 200 Important Areas. The equivalent figures for Important Areas within agglomerations can be found in the Agglomerations Action Plan.

Glossary and definition of acronyms, abbreviations and terms

A glossary of acoustical and technical terms is at **Appendix A**.

Table 1: Glossary and Definition of Acronyms, Abbreviations and Terms

Term	Definition
Agglomeration	An area having a population in excess of 100,000 persons and a population density equal to or greater than 500 people per km ² and which is considered to be urbanised.
Competent Authority	Defra (Department of Environment, Food and Rural Affairs)
END	Environmental Noise Directive (Directive 2002/49/EC)
First Round Agglomeration	An agglomeration but having a population in excess of 250,000 persons.
Noise Action Plan Support Tool (NAPST)	An on line tool to enable information exchange between Defra and local highway authorities and local authorities. It also allows local highway authorities to set out the outcomes of their investigations of the Important Areas
NPSE	Noise Policy Statement for England
Regulations	The Environmental Noise (England) Regulations 2006, as amended
Round 1	The noise mapping which took place in 2007 and the subsequent Action Plans that were adopted in 2010
Round 2	The noise mapping which took place in 2012 and this Action Plan
Round 3	The noise mapping that will take place in 2017 and the subsequent Action Plan revision
Relevant Rail Authorities	For the purposes of noise action planning in England, the Relevant Rail Authorities are the Department for Transport and the Office of Rail Regulation.
Technical Specification for Interoperability (TSI)	A suite of binding European Commission common, harmonised, technical standards required to satisfy the essential requirements of interoperability which include safety, reliability and availability, health, environmental protection and technical compatibility.

Part A: General issues

1. Policy and legal context

1.1 This Action Plan has been developed by the Department for Environment, Food and Rural Affairs (Defra) as the Competent Authority for preparing and adopting this Action Plan under the terms of the Environmental Noise (England) Regulations 2006, as amended ('the Regulations'). The Regulations implement the Environmental Noise Directive (END) in England. Noise is a devolved matter and the END is implemented separately within the Devolved Administrations.

1.2 Noise is a natural consequence of a mature and vibrant society. Noise, however, can have major implications for quality of life (wellbeing), human health, economic prosperity and the natural environment.

1.3 The Government's policy on noise is set out in the Noise Policy Statement for England (NPSE). The NPSE's vision is to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

Its aims are to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

1.4 The NPSE provides the policy framework to assist the implementation of the END and the Regulations.

1.5 The END seeks to manage the impact of environmental noise through strategic noise mapping and the preparation and implementation of Noise Action Plans. In particular the END requires, on a five year cycle:

- The determination, through noise mapping, of exposure to environmental noise from major sources of road, rail and aircraft noise and in urban areas (known as agglomerations).
- Provision of information to the public on environmental noise and its effects.
- Adoption of Action Plans, based upon the noise mapping results, which are designed to manage environmental noise and its effects, including noise reduction if necessary.

- Preservation of environmental noise quality where it is good, particularly in urban areas.

1.6 Under the terms of the END, Defra has completed the second round of strategic noise mapping, the results of which underpin this Action Plan.

1.7 This Action Plan is designed to address the management of environmental noise issues and effects.

1.8 Two complementary Action plans are being published covering the management of noise within agglomerations and from road sources².

2. Scope of this Action Plan

2.1 This Noise Action Plan is designed to address the management of noise issues and effects from railways (including Major Railways³) in England under the terms of the Regulations.

2.2 This Action Plan covers those railways that were included in the Round 2 noise mapping.

2.3 When identifying possible actions, account should be taken of the principles that already exist in current legislation and guidance.

2.4 This Action Plan replaces the previous Major Railways Noise Action Plan and the railways section of the 23 Agglomeration Plans previously adopted.

2.5 A glossary of acoustical and technical terms can be found at **Appendix A**.

3. Implementing this Action Plan

3.1 The responsibility for the management of noise from railway sources lies with various authorities including the Department for Transport and the other rail authorities. The implementation of this Action Plan forms part of their existing responsibilities in this area.

² The draft 'Noise Action Plan: Roads (Including Major Roads)' and 'Noise Action Plan: Agglomerations' can be viewed as part of this consultation.

³ A major railway is defined in the Environmental Noise (England) Regulations 2006, Regulation 3(10) as a railway which has more than 30,000 train passages a year.

4. Monitoring and review

- 4.1 Defra will monitor the progress of this Action Plan through liaison with the relevant authorities and will provide periodic updates on progress as necessary. As required by the Regulations, this Action Plan will be reviewed at least once every five years⁴.

5. Financial information

- 5.1 Defra undertook an informal evaluation to determine the likely costs of the proposals in this Action Plan. As this Action Plan describes a framework for the management of noise, the process does not impose any additional material costs on the rail authorities or local authorities. Instead it enables the rail authorities to target action to the worst affected areas and to develop proposals for assisting the management of noise as appropriate, including taking account of budgetary and other considerations. Any specific action identified will be based on local decisions - taking into account its cost and benefit.

⁴ Environmental Noise (England) Regulations 2006 (SI 2006/2238) Regulation 17(3)(b).

Part B: Approach to managing railway noise

6. Current approach to noise management

- 6.1 The management structure of the railway industry is complex with many bodies having various roles and responsibilities. With regard to noise management, this features in the Office of Rail Regulation (ORR) Sustainable Development and Environmental Duties document, which includes an undertaking to address the management of operational noise from train services⁵.
- 6.2 There are currently several approaches taken to control the impact of noise from railways, including:
- control of noise at source (including railway vehicle emission limit values);
 - planning controls – through the operation of the national, regional and local transport and land use planning system;
 - compensation and insulation - in the case of new, additional or altered works;
 - maintenance; and
 - specific initiatives including previously identified actions under the END.
- 6.3 Further information on the current approach can be found in **Appendix B**.

⁵ ORR – Sustainable Development and Environmental Duties, paragraph 3.3 (h)

Part C: Summary of noise mapping results

7. Summary of the results of the noise mapping, including an evaluation of the estimated number of people exposed to noise

7.1 The Regulations required that noise level information be determined in terms of several noise indicators⁶ (see also **Appendix A**). These were:

- L_{den}
- L_{day}
- $L_{evening}$
- L_{night}
- $L_{Aeq,16h}$
- $L_{Aeq,18h}$
- $L_{Aeq,6h}$

7.2 For the major railways covered by the Round 2 mapping, the estimated number of people⁷ (rounded to the nearest thousand) located outside agglomerations and falling within various noise level bands⁸ from the strategic mapping of **noise from those major railways alone** are shown in tables 2 – 4 below:

Table 2: Estimated number of people above various noise levels due to noise from major railways outside agglomerations, L_{den}

Noise Level (L_{den}) (dB)	Number of People
≥55	375,000
≥60	211,000
≥65	106,000
≥70	44,000
≥75	11,000

⁶ The Environmental Noise (England) Regulations 2006 (SI 2006/2238), Regulation 4(2) and Schedule 3(3)

⁷ The number of people has been determined by assigning population information from the 2011 census to residential building locations and rounded to the nearest 1,000.

⁸ The noise levels throughout this document refer to free-field levels at a height of 4m at the facades of dwellings.

Table 3: Estimated number of people above various noise levels due to noise from major railways outside agglomerations, L_{night}

Noise Level (L_{night}) (dB)	Number of People
≥50	286,000
≥55	155,000
≥60	72,000
≥65	26,000
≥70	5,000

Table 4: Estimated number of people above various noise levels due to noise from major railways outside agglomerations, $L_{\text{Aeq},18\text{h}}$

Noise Level ($L_{\text{Aeq},18\text{h}}$) (dB)	Number of People
≥55	225,000
≥60	116,000
≥65	47,000
≥70	11,000
≥75	1,000

7.3 For results for railways inside agglomerations, please see the Noise Action Plan: Agglomerations Data Appendix.

Part D: The Action Plan process

8. Identification of problems and situations that need to be investigated (Important Areas)

8.1 The Regulations require that this Action Plan should:

“apply in particular to the most important areas as established by the strategic noise maps”⁹.

8.2 To fulfil this requirement, attention has been focused on those most exposed to noise from railways covered by the Round 2 noise mapping carried out during 2012.

8.3 The Noise Insulation (Railways and Other Guided Transport Systems) Regulations include in their definition of criteria for eligibility, a noise level expressed as $L_{Aeq,18h}$. Defra has decided, therefore, to use the $L_{Aeq,18h}$ indicator as the basis for identifying Important Areas.

8.4 In reviewing the method for identifying Important Areas it was decided to continue to follow the principles used for Round 1. This will continue to help to deliver the vision and aims of the Government’s Noise Policy.

8.5 It has, therefore, been decided that the Important Areas with respect to noise from major railways will be where the 1% of the population¹⁰ that are affected by the highest noise levels from major railways are located according to the results of the strategic noise mapping¹¹. This approach has been taken because the population at these locations is likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life as a result of their exposure to railway noise.

8.6 For railways in agglomerations, the Important Areas with respect to railway noise in an agglomeration will be where the 1% of the population¹² that are affected by the highest noise levels from those railways mapped in the agglomeration are located

⁹ The Environmental Noise (England) Regulations 2006 (SI 2006/2238) Regulation 15(1)(e)

¹⁰ The total population is the number of people within the 50 dB $L_{Aeq,18h}$ contour from major railways outside agglomerations according to the 2011 census.

¹¹ At some locations, there may be an opportunity to investigate beyond the top 1% of the population but there is no requirement to investigate those dwellings where the $L_{Aeq,18h}$ is below 65 dB according to the results of the strategic noise mapping.

¹² The total population is the number of people in the agglomeration within the 50 dB $L_{Aeq,18h}$ contour from those railways in the agglomeration that were mapped, according to the results of the strategic noise mapping and the 2011 census.

according to the results of the strategic noise mapping¹³. This approach has been taken because the population at these locations is likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life as a result of their exposure to railway noise.

- 8.7 It has been estimated that the approximate number of people associated with the Important Areas identified through this process for the major railways outside agglomerations is just under 4,000. This is expected to correspond to just over 200 Important Areas. The equivalent figures for Important Areas within agglomerations can be found in the Agglomerations Action Plan.
- 8.8 Supporting maps indicating the locations of Important Areas will be available on the Defra website once the final Action Plans are published.
- 8.9 As with Round 1, it is anticipated that rail authorities will examine each Important Area having regard to any ongoing noise mitigation initiatives, schemes and plans.

9. Noise reduction measures already in force and any projects in preparation

- 9.1 For any particular location, there is a wide range of measures that can be implemented to provide improved management of the railway noise and/or noise reduction. Some of the possible measures are described below.

Source levels

- 9.2 Routinely, railhead grinding occurs as part of the general maintenance of the track. Such grinding has been found to reduce the rolling noise emitted from the wheel and track and, hence, has the benefit of providing noise reduction.
- 9.3 Other techniques that have been implemented that effectively reduce noise at source include replacement of cast-iron tread brakes by disc brakes or composite tread brakes on rolling stock, and the replacement of diesel trains with electric stock as electrification progresses across the network.
- 9.4 In addition, the continued implementation of the Technical Specification for Interoperability (TSI) standards for new rolling stock will reduce the source noise from rail vehicles.

¹³ In some agglomerations, there may be an opportunity to investigate beyond the top 1% of the population but there is no requirement to investigate those dwellings where the $L_{Aeq,18h}$ is below 65 dB according to the results of the strategic noise mapping.

Noise Barriers or other similar methods

- 9.5 The use of barriers to reduce the propagation of noise from a railway to a sensitive receptor is used, where appropriate.

Façade Insulation

- 9.6 Securing an appropriate standard of internal acoustic conditions is often achieved by the careful design of the sound insulation provided by the building envelope. This can either occur at the design stage of a new structure or by improving the insulation of an existing building. Where necessary, alternative ventilation is provided so that windows can be kept closed but with ventilation still available.
- 9.7 For all these potential measures, the overall costs and benefits need to be considered. Account should also be taken of any accompanying benefits that might occur.

Implementation of Round 1 Noise Action Plans

- 9.8 Just over 100 Important Areas associated with the Round 1 major railways were identified during the first round noise action planning process. These were located throughout England and were associated with just over 2,000 people.

10. The Implementation of this Action Plan

- 10.1 Defra will liaise with, and provide information to, rail authorities about the Important Areas identified in Section 7 above.
- 10.2 For the purposes of this Action Plan, the Relevant Rail Authorities are the Department for Transport and the Office of Rail Regulation. In developing plans for managing rail related noise, the Relevant Rail Authorities will consult and be advised by a cross-industry group. This group will be facilitated by the Rail Safety and Standards Board (RSSB) and involve Network Rail, the Association of Train Operating Companies (ATOC), train owners, the rail supply industry and passenger and freight operators.
- 10.3 Concurrently, the relevant local authorities will be provided with similar information. This information will go to the departments with primarily environmental health responsibilities, thereby enabling them to participate in the detailed identification of any noise management measures. The information will be provided through the Noise Action Plan Support Tool, devised and produced by Defra for the Round 1 action planning to provide cost-efficient information exchange.
- 10.4 As with Round 1, rail authorities will be asked to examine the Important Areas and form a view about what measures, if any, might be taken in order to assist with the implementation of the Government's policy on noise.
- 10.5 More details of the process are set out below:

- 10.6 For each Important Area, rail authorities will consider what, if any, actions might be taken.
- 10.7 If a certain length of railway is associated with several Important Areas rail authorities should consider measures that could address the noise issues at all the locations concurrently.
- 10.8 Rail authorities should also take account of any existing plans (e.g. any local transport plans or land-use plans) or any specific noise mitigation schemes that are already in preparation that may affect the Important Areas.
- 10.9 For each Important Area, rail authorities will identify proposed actions that will meet the vision and aims set out in the Government's policy on noise, or state why, in their view, no further action can or needs to be taken in order to meet this objective.
- 10.10 In forming their view about possible action, rail authorities should take account of any benefit that might also be achieved for any other noise sensitive premises either in the vicinity of the Important Area being investigated or elsewhere. Furthermore, consideration should be given to integrating noise management actions at an Important Area with the concurrent implementation of other environmental or related initiatives for example in managing air quality, or protecting any formally identified quiet areas.
- 10.11 It is expected that these deliberations will result in six general outcomes and actions:
- A: It is possible to be able to implement an action and there are financial resources immediately available to do so.
- Action:** If it is clear that the proposed action will provide the expected benefit, then rail authorities will determine a timetable for implementation. Outcome A also covers work that may have started before the Round 2 mapping was carried out but not finished at the time of the mapping.
- B: It is possible to be able to implement an action but there are no immediately available financial resources to do so.
- Action:** Rail authorities will make arrangements to secure financial resources to carry out this work in the future. This might be achieved by either:
- securing new resources for this work; or
 - re-prioritising existing budgets to enable the funds for the action to become available
- Once the budget has been secured, rail authorities will determine a timetable for implementation.

C: It is not possible to implement any action because there is no scope for doing so, or there is some overriding technical issue that prevents implementation.

Action: Rail authorities will inform Defra and the relevant local authority that this is the case, appropriately justified.

D: It is not possible to implement any action because there would be large adverse non-acoustics effects that could not be accommodated by the proposed measure.

Action: The rail authorities will inform Defra and the relevant local authority that this is the case, appropriately justified.

E: Nothing further needs to be done as the noise level at each dwelling in the Important Area is below 65 dB(A), $L_{Aeq,18h}$, ignoring the effect of reflection from the facade of the relevant dwelling.

Action: The rail authorities will demonstrate to Defra and the relevant local authority that this is the case.

A/B: Both Outcomes A and B apply

11. Liaison with relevant local authorities

11.1 The rail authorities will liaise with the relevant local authorities as appropriate about progress and, in the end, the outcomes. This liaison should cover information about the proposed schedule of investigation, and proposed timing of any implementation of possible actions. The Noise Action Plan Support Tool provides a mechanism to assist with this liaison.

11.2 The relevant local authority may separately identify locations that have not currently been identified as Important Areas for possible further noise management actions and request that consideration be given by the rail authorities to including them in the action planning schedule. The rail authorities may also identify additional locations as Important Areas.

11.3 Given that one of the obligations regarding Action Plans for agglomerations is the aim to protect formally identified quiet areas in agglomerations, rail authorities will need to consider whether any element of the proposed measures might conflict with any such quiet areas within an agglomeration or any other spaces valued for their quiet or relative quiet.

12. Liaison with the Public

- 12.1 The rail authorities should, at the appropriate time, liaise with those members of the public who are likely to be most affected by any proposed new noise management proposal.

13. Reporting and Consultation

- 13.1 Defra will liaise with the rail authorities to prepare documentation setting out the results of these investigations, including the timetable for any proposed actions. Defra in conjunction with the rail authorities will consult with the relevant local authorities and any other relevant stakeholders as appropriate on these results.
- 13.2 Defra will liaise with the rail authorities and consider the responses to the consultation and with the rail authorities make any alterations to the proposals as they see fit.
- 13.3 Defra will liaise with rail authorities to finalise the documentation described above including appropriate information about the consultation.
- 13.4 The primary mechanism to be used for this aspect is the Noise Action Plan Support Tool.

14. Implementation and Monitoring

- 14.1 The Regulations state that any actions identified during this process are regarded as forming part of the policy of the relevant authority, and hence need to be implemented as indicated.
- 14.2 Defra will monitor the progress of this Action Plan through liaison with the relevant authorities. Defra will provide periodic updates on progress, as required, to the relevant local authorities via the Noise Action Plan Support Tool.

Part E: Long term strategy

15. Long term strategy

- 15.1 The Round 1 Noise Action Plans set the long term strategy regarding the management of railway noise. This section provides an update on progress and details of further actions to be carried out over the next five years.
- 15.2 Defra has worked with the Relevant Rail Authorities to establish a clear framework of responsibility so that noise from railways is managed in the context of the Government's policy on noise and such that the process is clearly understood by the public. Defra will continue to implement this framework including through
- the consultation on this Action Plan;
 - the dissemination of the results of the Round 2 mapping; and
 - monitoring the implementation of this Action Plan.
- 15.3 Defra recognises the need for a robust and reliable system of data collection, management and control to enable the strategic noise mapping to take fully into account all the input variables that affect the resulting noise levels generated. Consequently, Defra did liaise with the relevant bodies to improve data quality and coverage for the Round 2 mapping, for example by including data (where available) on any mitigation measures already in place (e.g. the effect of increased use of railhead grinding).
- 15.4 It is expected that for Round 3 the European Commission will introduce a European-wide common noise mapping methodology. Defra will continue to work closely with the European Commission so that the method is robust, proportionate and provides an appropriate level of strategic results.
- 15.5 Defra had recognised that for Round 1 it was possible to gain no more than an indication of the night noise impact from railways. For Round 2, more robust data were used to generate the results for the night period (23.00 – 07.00). Defra will continue to work with the relevant authorities to establish a mechanism that continues to secure robust input data that will support the common assessment method, including for the night period (23.00 – 07.00).
- 15.6 Defra has actively engaged, through colleagues in other Government departments, with the European Commission and other relevant organisations on initiatives that seek to reduce the noise from railways at source. Defra will continue to engage on the development of measures that are designed in general to manage the impact of noise from railways.
- 15.7 Defra has been actively involved in the process that has updated the land use planning policy set out in the National Planning Policy Framework. This framework

was published in 2012 and does recognise the impact that can be caused by noise. Defra has also been involved in developing additional guidance on noise, which encourages future land use planning policies at a national, regional and local level to reflect the processes set out in this Action Plan

- 15.8 Defra will continue to liaise with relevant national and local policy making bodies to encourage proper consideration of noise management issues in policy development.
- 15.9 Defra has worked closely with the Department of Health and Public Health England to have noise recognised as a wider determinate of health in the Public Health Outcomes Framework Indicators¹⁴. Defra will update the relevant part of the indicator with the results from the Round 2 mapping. Defra will continue to disseminate this information via the relevant authorities.
- 15.10 Defra will continue to liaise with the Relevant Rail Authorities to explore the extent to which the current complaint system operated by Network Rail does provide a robust and easily accessible complaints handling system for railway noise issues.
- 15.11 Defra will continue to encourage research into improved building envelope sound insulation and related ventilation issues.
- 15.12 Defra will continue to liaise with the Department for Transport to explore a range of issues including:
- the current overall community response to railway noise, including whether or not further survey work required;
 - the importance and relevance to people of the potentially quiet gaps between train movements; and
 - the role that sound from railways might play as a feature of soundscape.
- 15.13 Defra will keep under review the definition of Important Areas used in this Action Plan.
- 15.14 Defra will continue to develop, agree and disseminate good practice approaches and methodologies through the Interdepartmental Group on Costs and Benefits noise subject group (IGCB(N)) to support the policy appraisal of noise. Further information is available from <https://www.gov.uk/noise-pollution-economic-analysis>.
- 15.15 Defra will keep under review the issues raised in this Section and will report progress as part of the Round 3 action planning.

¹⁴ Public Health Outcomes Framework: <http://www.phoutcomes.info/>

Part F: Consultation

16. Informal consultation

16.1 During the development of this Action Plan, Defra held informal discussions with various bodies including:

- Representatives of the Rail Industry;
- Transport for London;
- Relevant Government Departments ; authorities and local authorities; and
- Relevant Stakeholders

17. Formal public consultation

17.1 To be completed when consultation completed and responses reviewed.

Appendices

Appendix A: Glossary of acoustic and technical terms

Term	Definition
Agglomeration	An area having a population in excess of 100,000 persons and a population density equal to or greater than 500 people per km ² and which is considered to be urbanised
dB(A)	A measure of sound pressure level (“A” weighted) in decibels as specified in British Standard BS EN 61672-2:2003
L _{Aeq,T}	The A-weighted equivalent continuous sound pressure level which is a notional continuous level that, at a given position and over the defined time period, T, contains the same sound energy as the actual fluctuating sound that occurred at the given position over the same time period, T
L _{day}	The L _{Aeq} over the period 0700 – 1900, local time (for strategic noise mapping this is an annual average)
L _{evening}	The L _{Aeq} over the period 1900 – 2300, local time (for strategic noise mapping this is an annual average)
L _{night}	The L _{Aeq} over the period 2300 – 0700, local time (for strategic noise mapping this is an annual average)
L _{Aeq,16h}	The L _{Aeq} over the period 0700 – 2300, local time (for strategic noise mapping this is an annual average)
L _{den}	The L _{Aeq} over the period 0000 – 2400, but with the evening values (1900 – 2300) weighted by the addition of 5 dB(A), and the night values (2300 – 0700) weighted by the addition of 10 dB(A).
L _{Aeq,18h}	The L _{Aeq} over the period 0600 – 2400, local time (for strategic noise mapping this is an annual average)
L _{Aeq,6h}	The L _{Aeq} over the period 2400 – 0600, local time (for strategic noise mapping this is an annual average)

Appendix B: Current approach to railway noise management

Control of Noise at Source

- B1 Noise from individual railway vehicles is increasingly being controlled through legislation which sets limits for noise emissions from rail vehicles and other equipment used on the railway.
- B2 Technical Specifications for Interoperability (TSIs) are a suite of binding European Commission common, harmonised, technical standards required to satisfy the essential requirements of interoperability which include safety, reliability and availability, health, environmental protection and technical compatibility. The EC first adopted a TSI, containing noise requirements in 2002, in the High Speed Rolling Stock TSI 2002/735/EC, which was superseded in 2008 by a revised version 2008/232/EC. A Conventional Rail Noise TSI, 2006/66/EC, was introduced in 2006 and revised in 2011 as 2011/229/EC. The 2011 TSI states in its implementation section (Chapter 7) that the European Commission (the Commission) will consider options for retrofitting of existing freight wagons for noise reduction with stakeholders and the rail industry. The possibility of such an initiative is also reflected in the Commission's Communication on rail noise abatement (COM(2008)432) in which a combination of measures including noise-differentiated access charges for freight vehicles and noise emission limits for all vehicles was proposed. The Commission propose to implement the access aspects through a future recast of Directive 2001/14/EC, which provides for general requirements on access to and charging for the use of railway infrastructure. The noise-related TSIs include limits for starting noise, noise from stationary vehicles and pass-by noise. Many vehicles have already been introduced that meet these limits. A new, combined, High Speed and Conventional Rail Noise TSI is currently under development, and is expected to be in force by 2015 at the latest.
- B3 Further research managed by RSSB (formerly the Rail Safety and Standards Board) has produced a long term trend line for the United Kingdom rail fleet in terms of its noise outputs, measured using the TSI criteria¹⁵. The TSIs covering conventional and high speed rolling stock currently adopt a two-step approach to reduce the noise emission limits over time. Furthermore, disc brakes or composite brake blocks, which result in smoother wheels and hence lower rolling noise than that emitted from stock with cast-iron brake blocks, are installed on many passenger vehicles and freight vehicles.

¹⁵ T835 Trends in GB rolling stock noise levels
(www.rssb.co.uk/research/rail_industry_research_programme.asp)

- B4 Routinely, railhead grinding occurs as part of the general maintenance of the track. Such grinding has been found to reduce the rolling noise emitted from the wheel and track and hence, has the benefit of providing environmental noise reduction.

Planning controls

- B5 When proposing the construction of a new railway, or additional lines to an existing rail corridor, a noise impact assessment must be carried out. The process to be followed is set out in relevant Environmental Impact Assessment Regulations¹⁶. Mitigation such as optimising the track construction and alignment and the use of noise barriers, either through landscaping or purpose built walls or fences, are included in the design to minimise any adverse noise impact.
- B6 Once the basic data regarding the potential impact of the proposals has been obtained (including predicting the noise from the new or altered railway), an estimate of the likely numbers of people to be affected is made. In addition, through the Transport Appraisal Guidance¹⁷, the noise impact can be monetised as a means of evaluating the overall merits of the proposal.
- B7 Through the operation of the land use planning system, a noise assessment would normally be carried out for any proposed residential development that may be affected by railway noise. The National Planning Policy Framework sets out the overall policy to be applied by local planning authorities in their plan making and decision taking. Those policies are consistent with the Government's policy on noise as set out in the NPSE. Guidance is available through relevant British Standards (e.g. British Standard 8233:1999¹⁸ (BS8233)) about the type of mitigation that might be needed in order to achieve the internal noise levels within homes that comply with the policy. The approaches used to achieve these levels include designing appropriate façade insulation or optimising the proposed layout of the buildings.
- B8 BS 8233 also provides design advice for other various buildings in order to mitigate the effects of noise from railways.
- B9 Advice is also available regarding acoustics in schools, including target noise levels for the indoor and outdoor environment in order to secure an appropriate acoustic environment for teaching.

¹⁶ For example: The Transport and Works (Assessment of Environmental Effects) Regulations 2006

¹⁷ Department for Transport, Transport Analysis Guidance, Unit 3.3.2 Noise Sub-Objective (November 2006)

¹⁸ BS8233:1999, Sound insulation and noise reduction in buildings – Code of Practice. This BS is currently being revised.

Compensation and insulation

- B10 For new, additional or altered works to a railway system, the Land Compensation Act 1973 allowed regulations to be promulgated to provide compensation for dwellings affected by increased noise. These regulations are the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996¹⁹. If certain criteria are met, the promoter of the scheme must offer secondary glazing and alternative ventilation for habitable rooms of dwellings so affected.
- B11 In addition, Part 1 of the Land Compensation Act provides for monetary compensation to those home owners affected by the new or altered railway recognising any loss in value of the home that has occurred by the opening of the new or improved railway. This assessment is purely subjective, carried out by surveyors, and claims have to be made within a certain time period.

Maintenance

- B12 As mentioned in B4, railhead grinding occurs as part of the general maintenance of the track. Such grinding, provided it is regularly repeated, has been found to reduce maintenance costs, extend rail life and reduce the rolling noise emitted from the wheel and track. Consequently, this process has the benefit of providing noise reduction at the wheel/rail interface and through reduced railway maintenance activities involving rail replacement. Defra previously commissioned research to understand the potential acoustic benefits of railhead grinding²⁰.

General Policy

- B13 The Office of Rail Regulation has adopted as part of its sustainable development and environmental duties an undertaking to address the issue of the management of operational noise from train services.

Limit values

- B14 There are no relevant formal noise limit values in force in England with regard to environmental noise levels from railway systems. However, the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996²¹ define a threshold level as part of the eligibility criteria. The TSIs include limit values at

¹⁹ The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (SI 1996/428)

²⁰ "Rail and wheel roughness – implications for noise mapping based on the Calculation of Railway Noise procedure" (DEFRA, March 2004)

²¹ Statutory Instrument 1996 No. 428 -The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996

source for new railway vehicles, and occupational noise limits apply through general Health & Safety legislation for workplaces.

Specific initiatives

- B15 The use of continuously welded rail has been found to help reduce operational noise although switch and crossing noise cannot be eliminated by continuous welding. Modern switch and crossing units are manufactured to much finer tolerances meaning that gaps at joints are much smaller and are therefore quieter in use.
- B16 Although not directly related to operational noise, the noise from train horns has been addressed over recent years. The national Railway Group Standard for horns now specifies a maximum noise level (in addition to a minimum level). Furthermore, the Rule Book has been amended to reduce the number of occasions on which the sounding of the horn is mandatory.
- B17 In a similar vein, there has been improved management of the noise from station Public Address systems, with the sound level of these announcements being deliberately reduced and with the number of announcements in the early morning being reduced.
- B18 The Network Rail National Helpline is operated 24 hours a day, every day, to answer questions from the public and to assist with any issues arising from the operation of the railway, including noise. The Helpline number is 08457 114141. Alternatively, the helpline can be reached via: www.networkrail.co.uk.

Noise Action Plans

- B19 The implementation of the Environmental Noise Directive resulted in the generation of Noise Action Plans for Round 1. Two types of plan related to railway noise: the plan for Major Railways, and the plans for the first round agglomerations. As required by the Directive and the corresponding regulations, Important Areas were defined. These were where the 1% of the population are located that are affected by the highest noise levels from those railways mapped in each agglomeration and from the major railways according to the results of the first round of strategic noise mapping. This approach was taken because the population at those locations are likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life as a result of their exposure to railway noise.
- B20 Across railways in England, just over 600 locations were identified. Through the use of an integrated, password protected computer-based tool, information about these locations was provided to the rail authorities and the relevant local authorities in whose area the Important Areas were located.
- B21 The rail authorities were asked to investigate each of the Important Areas and form a view about what measures, if any, might be taken at those locations in order to

assist the management of environmental noise in the context of Government policy on sustainable development (Stage 1 of the process).

B22 Having completed that initial investigation, the rail authorities were asked to liaise with the relevant local authority about the decision they reached (Stage 2). Following that liaison, the rail authorities would finalise their decision and implement it (Stage 3).

B23 Six possible outcomes are available:

These are:

- A: It is possible to be able to implement an action and there are financial resources immediately available to do so.
- B: It is possible to be able to implement an action but there are no immediately available financial resources to do so.
- C: It is not possible to implement any action because there is no scope for doing so or there is some overriding technical issue that prevents implementation.
- D: It is not possible to implement any action because there would be large adverse non-acoustics effects that could not be accommodated by the proposed measure.
- E: Nothing further needs to be done as the noise level at each dwelling in the Important Area is below 65 dB(A), $L_{Aeq,18h}$, ignoring the effect of reflection from the facade of the relevant dwelling.

A/B: Both Outcomes A and B apply

The adopted first round Noise Action Plans included just four of these outcomes (A, B, C & D). As the Action Plan implementation was taken forward, feedback from rail authorities indicated a desire to have two more outcomes (E and A/B). These outcomes were subsequently included and have been used in the implementation process.

B24 At the time of adoption of this plan, no locations had reached Stage 3, nearly 600 had reached Stage 2 and one had reached Stage 1.