

Summary: Intervention & Options

Department /Agency: Defra	Title: Impact Assessment of Environmental Noise Action Plans	
Stage: Final	Version: 1	Date: 19 June 2009
Related Publications: Environmental Noise (England) Regulations 2006 (as amended) http://www.defra.gov.uk/environment/noise/ambient.htm#2		

Available to view or download at:

<http://www.defra.gov.uk/corporate/consult/noise-action-plan/index.htm>

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What is the problem under consideration? Why is government intervention necessary?

Most people in the UK are affected by noise from transportation and/or industrial sources. Government intervention is necessary to manage and control this noise as exposure to it can have direct and indirect health effects and also adversely affect quality of life. As part of the management process, Directive 2002/49/EC has been transposed into English law through the Environmental Noise (England) Regulations 2006, as amended. These regulations require the production of strategic noise maps, the presentation of information to the public and the preparation of noise action plans based on the results of the maps.

What are the policy objectives and the intended effects?

The aim of the Action Plans is to use the strategic noise maps to identify important areas and to determine what further measures might be taken to manage better the noise impact at those locations and to reduce it if necessary. In addition, the action plans for agglomerations must include measures that aim to protect open spaces which provide significant and important benefits because they are quiet. The overall policy objective is to seek good health and good quality of life through the management of noise in the context of sustainable development.

What policy options have been considered? Please justify any preferred option.

The production of Action Plans is a legal requirement. The various options that have been considered revolve around the process for producing action plans and the identification of priorities. These are¹:

1. Information is passed to the relevant noise makers responsible for the sources that are causing the noise in the important areas. They will be given a timetable and expected to identify what measures they intend to take.
2. Local authorities in whose area the important areas are located take the lead and liaise with the relevant noise making authorities to determine what measures if any are to be taken.
3. Defra, as competent authority, would work with the relevant noise making authorities encouraging them to consider what further measures might be taken. At the same time Defra would facilitate liaison with local authorities. Under this option three approaches to identifying priority areas considered were:
 - a) Identify top 0.5% of populations exposed with priority given to exposure of 80dB(A) or over according to the noise maps;
 - b) Identify top 1% of populations exposed with priority given to exposure of 76dB(A) or over according to the noise maps; and
 - c) Identify the population with exposure of 65dB(A) or over according to the noise maps

The preferred option is (3b) it is seen to be a pragmatic approach to implementing the first round of Noise Action Plans. It is noted that this does not yield the highest potential net benefit, but it does provide the highest cost benefit ratio.

Options 1 and 2 are summarised in the body of the text and do not have summary analysis and evidence sheets.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The Regulations require noise maps to be produced every 5 years followed by the review of existing action plans and/or the preparation of new action plans. The next round of mapping is in 2012 with the action plans being prepared in the following year.

Ministerial Sign-off For Final Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Date:

Summary: Analysis & Evidence

Policy Option: 3a

Description: Important Areas are defined as the top 0.5 per cent of population with priority given to those exposed to 80dB(A) or more according to the noise maps.

COSTS	ANNUAL COSTS		Description and scale of key monetised costs by 'main affected groups' The key cost is the implementation of noise mitigation measures as appropriate. Once installed the ongoing maintenance costs are seen to be minimal.
	One-off (Transition)	Yrs	
	£ 0.4 million	1	
	Average Annual Cost		
	£ 0.003million		Total Cost (PV) £ 0.9 million
<p>Other key non-monetised costs by 'main affected groups'</p> <p>The key non-monetised costs include the costs for the investigation and evaluation of the important areas, central review of action plans and stakeholder liaison, and other impacts associated with the mitigation measures such as aesthetic impacts.</p>			

BENEFITS	ANNUAL BENEFITS		Description and scale of key monetised benefits by 'main affected groups' The benefits are assessed based on amenity value of reduced noise levels in affected households. This valuation is an approximation of the additional cost that the general public would be willing to pay to secure a reduction in noise.
	One-off	Yrs	
	£ 0		
	Average Annual Benefit		
	£ 0.09m		Total Benefit (PV) £ 1.7 million
<p>Other key non-monetised benefits by 'main affected groups'</p> <p>Noise imposes a wide range of impacts on human health, amenity, productivity and ecosystems. The above figures only relate to amenity effects and therefore exclude these other impacts. The Interdepartmental Group on Costs and Benefits noise subject group is developing methodologies to enable the inclusion of these wider impacts, but these are not available yet.</p>			

Key Assumptions/Sensitivities/Risks

The key assumptions are: that the marginal impact of mitigation measures is constant across the different locations; and that no significant impacts occur with regard to rail sources and the protection of quiet areas. A key risk is that the important areas identified do not justify additional noise mitigation action in the context of sustainable development. To take of this into account, the realised impacts have been based on assuming that 2% of the identified households would attract mitigation (see para 7.18).

Price Base Year 2008	Time Period Years 30	Net Benefit Range (NPV) £ -0.5 million¹ - £6.4 million²	NET BENEFIT (NPV Best estimate) £ 0.8 million
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¹ Where no additional noise mitigation is undertaken ² Assuming action taken for 10% of identified households.

Summary: Analysis & Evidence

Policy Option: 3b

Description: Important Areas are defined as the top 1 per cent of population with priority given to those exposed to 76dB(A) or more according to the noise maps.

COSTS	ANNUAL COSTS		Description and scale of key monetised costs by 'main affected groups' The key cost is the implementation of noise mitigation measures as appropriate. Once installed the ongoing maintenance costs are seen to be minimal.
	One-off (Transition)	Yrs	
	£ 3.5 million	1	
	Average Annual Cost		
	£ 0.03m		Total Cost (PV) Up to £ 3.9 million
<p>Other key non-monetised costs by 'main affected groups'</p> <p>The key non-monetised costs include the costs for the investigation and evaluation of the important areas, central review of action plans and stakeholder liaison, and other impacts associated with the mitigation measures such as aesthetic impacts.</p>			

BENEFITS	ANNUAL BENEFITS		Description and scale of key monetised benefits by 'main affected groups' The benefits are assessed based on amenity value of reduced noise levels in affected households. This valuation is an approximation of the additional cost that the general public would be willing to pay to secure a reduction in noise.
	One-off	Yrs	
	£ 0		
	Average Annual Benefit		
	£ 0.92m		Total Benefit (PV) Up to £ 17.5 million
<p>Other key non-monetised benefits by 'main affected groups'</p> <p>Noise imposes a wide range of impacts on human health, amenity, productivity and ecosystems. The above figures only relate to amenity effects and therefore exclude these other impacts. The Interdepartmental Group on Costs and Benefits noise subject group is developing methodologies to enable the inclusion of these wider impacts, but these are not available yet.</p>			

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The key assumptions are: that the marginal impact of mitigation measures is constant across the different locations; and that no significant impacts occur with regard to rail sources and the protection of quiet areas. A key risk is that the important areas identified do not justify additional noise mitigation action in the context of sustainable development. To take of this into account, the realised impacts have been based on assuming that 2% of the identified households would attract mitigation (see para 7.18).

Price Base Year 2008	Time Period Years 30	Net Benefit Range (NPV) £ - 1.0¹ - £73.1² million	NET BENEFIT (NPV Best estimate) £ 13.6 million
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¹ Where no additional noise mitigation is undertaken ² Assuming action taken for 10% of identified households.

Summary: Analysis & Evidence

Policy Option: 3c

Description: Important Areas are defined as the population with exposure of 65dB(A) or more according to the noise maps.

COSTS	ANNUAL COSTS		Description and scale of key monetised costs by 'main affected groups' The key cost is the implementation of noise mitigation measures as appropriate. Once installed the ongoing maintenance costs are seen to be minimal.
	One-off (Transition)	Yrs	
	£ 106m	1	
	Average Annual Cost		
	£ 0.1m		Total Cost (PV) Up to £ 107m
<p>Other key non-monetised costs by 'main affected groups'</p> <p>The key non-monetised costs include the costs for the investigation and evaluation of the important areas, central review of action plans and stakeholder liaison, and other impacts associated with the mitigation measures such as aesthetic impacts.</p>			

BENEFITS	ANNUAL BENEFITS		Description and scale of key monetised benefits by 'main affected groups' The benefits are assessed based on amenity value of reduced noise levels in affected households. This valuation is an approximation of the additional cost that the general public would be willing to pay to secure a reduction in noise.
	One-off	Yrs	
	£ 0		
	Average Annual Benefit		
	£ 23.7m		Total Benefit (PV) Up to £ 451m
<p>Other key non-monetised benefits by 'main affected groups'</p> <p>Noise imposes a wide range of impacts on human health, amenity, productivity and ecosystems. The above figures only relate to amenity effects and therefore exclude these other impacts. The Interdepartmental Group on Costs and Benefits noise subject group is developing methodologies to enable the inclusion of these wider impacts, but these are not available yet.</p>			

Key Assumptions/Sensitivities/Risks

The key assumptions are: that the marginal impact of mitigation measures is constant across the different locations; and that no significant impacts occur with regard to rail sources and the protection of quiet areas. A key risk is that the important areas identified do not justify additional noise mitigation action in the context of sustainable development. To take of this into account, the realised impacts have been based on assuming that 2% of the identified households would attract mitigation (see para 7.18).

Price Base Year 2008	Time Period Years 30	Net Benefit Range (NPV) £ -20 million¹ - £1,720² million	NET BENEFIT (NPV Best estimate) £ 344 million
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¹ Where no additional noise mitigation is undertaken ² Assuming action taken for 10% of identified households.

What is the geographic coverage of the policy/option?		England		
On what date will the policy be implemented?		Late 2009		
Which organisation(s) will enforce the policy?		Defra		
What is the total annual cost of enforcement for these organisations?		£ 0		
Does enforcement comply with Hampton principles?		N/A		
Will implementation go beyond minimum EU requirements?		No		
What is the value of the proposed offsetting measure per year?		£ N/A		
What is the value of changes in greenhouse gas emissions?		£ 0		
Will the proposal have a significant impact on competition?		No		
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?				

Impact on Admin Burdens Baseline (2005 Prices)		(Increase – Decrease)		
Increase of	£ 0	Decrease of	£ 0	Net Impact £ 0

Annual costs and benefits: Constant Prices (Net) Present Value

Evidence Base (for summary sheets)

1. Executive Summary

1.1 This impact assessment considers the costs and benefits of the various options for identifying important areas and investigating the need for implementing additional noise mitigation in the context of sustainable development. This is a key step in the process of fulfilling the Government's obligations under Directive 2002/49/EC as transposed by the Environmental Noise (England) Regulations 2006, as amended.

1.2 There are two elements to this assessment: Determining the process for identifying important areas; and determining the body or bodies who should lead the process.

1.3 It is recommended that the important areas are those where the top 1% of the population are affected by the highest levels of noise, but as a priority, attention being focussed on those locations with a noise exposure of 76 dB(A) or more ($L_{A10,18h}$ for road traffic) according to the noise maps¹.

1.4 It is recommended that the process would be led by Defra, as Competent Authority, encouraging the noise makers to investigate the important areas and to form a view over what further measures might be taken to improve the management of noise in the context of sustainable development. Concurrently, Defra will facilitate the involvement of the relevant local authorities to enable their participation in the process.

1.5 This assessment gives an indication of the value of benefits that are expected from this process. The precise value will depend on exactly how many of the important areas are identified for further noise mitigation.

2. Scope of this IA

2.1 This impact assessment concerns the process to be adopted for developing noise action plans under the terms of the Environmental Noise (England) Regulations 2006, as amended. The Secretary of State is the competent authority for developing action plans for the 23 first round agglomerations, for major roads and for major railways. It is designed to accompany the formal publication for consultation of these draft noise action plans and considers the costs and benefits associated with the implementation of these Action Plans.

2.2 As the draft Action Plans set out a strategic approach, the IA focuses on the options for examining and identifying important areas and determining what, if any, further measures might be taken to manage better the noise impact in the context of sustainable development. For any measure that is identified, it is presumed that the valuation outcome will be positive and at worst cost neutral.

3. Background

3.1 Directive 2002/49/EC was adopted by the European Parliament and the Council of the European Union on 25 June 2002 and transposed into UK law through the Environmental Noise (England) Regulations 2006 (as amended). This legislation looks to establish a strategic approach to environmental noise, through the compiling of noise maps for agglomerations (urban areas), major transport routes and major airports.

3.2 'Environmental noise' is defined in the Directive as: 'unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and noise from sites of industrial activity. The Directive applies to environmental noise to which humans are exposed, but it specifically excludes noise created by the exposed person, noise from domestic activities, neighbour noise, noise at workplaces, noise inside means of transport and noise from military activity in military areas.

3.3 The first round of noise mapping was completed, on time, in 2007 and the results submitted to the Commission at the end of that year. The results can be seen at: <http://www.defra.gov.uk/noisemapping>.

3.4 The next stage of the process is the preparation and implementation of noise action plans. The regulations have designated the relevant airport operator as competent authority for preparing and implementing noise action plans for airports and they are proceeding with that process. This assessment concerns the actions plans for the first round agglomerations, the major roads and major railways for which the Secretary of State is the competent authority. The procedure involves the identification of important areas from the results of the noise mapping and relevant authorities will consider what further measures, if any, might be taken to manage better the noise environment at those locations in the context of sustainable development. As indicated above, when considering specific measures a cost benefit assessment will be carried out and it is anticipated that no measure will be implemented unless it can be shown to have a positive benefit or at worst be cost neutral.

3.5 The Regulations also require the identification of quiet areas in agglomerations and for the action plans to include measures that aim to protect these areas from an increase in noise.

3.6 The Directive requires the competent authorities, as designated by the Member States, to develop and adopt Action Plans 'designed to manage, within their territories, noise issues and effects, including noise reduction

¹ The equivalent threshold for railways is 73 dB(A), $L_{Aeq,18h}$

if necessary' (Article 8, paragraph 1). Annex V of the Directive sets out the minimum contents of the noise action plans. These include:

- a description of the agglomeration or major noise source to be considered;
- the authority responsible;
- the legal context; any limit values in place;
- a summary of the results of the noise mapping;
- an evaluation of the estimated number of people exposed to noise, identification of problems and situations which need to be improved;
- a record of the public consultation;
- current noise reduction measures in force or in preparation;
- actions which the competent authorities intend to take in the next five years (including preservation of quiet areas);
- long-term strategy;
- financial information (this includes cost effectiveness); and
- provisions for evaluation of the action plans.

4. Main Affected Groups

4.1 This policy will affect a number of different groups:

- The Secretary of State, who is responsible for developing and adopting the Action Plans;
- Those parties who are responsible for the sources that generate the noise affecting those locations in the identified important areas. These include the Highways Agency, local Highway Authorities and relevant rail authorities.
- Local Authorities, who will have the opportunity to work with the above parties to assist in the action planning process and ensure that local priorities are properly taken into account;
- The general population, especially those located in the important areas and who might benefit from any additional measures to improve the noise management.
- Local Authorities would also be expected to be part of the process of identifying quiet areas that might warrant additional protection with the aim of avoiding an increase in noise.

5. Objective

5.1 The objective of the action planning process is to manage, and to reduce where necessary, the environmental noise exposure for people in England. This would be carried out in the context of sustainable development to achieve the overall policy objective of seeking to achieve good health and good quality of life through the management of noise in the context of sustainable development.

6. Options

6.1 Three options have been considered in this IA. These are:

1. On the Polluter Pays Principle, information is passed to the relevant noise makers responsible for the sources that are causing the noise in the important areas. They will be given a timetable and expected to identify what measures they intend to take.
2. Local authorities in whose area the important areas are located will be asked to take the lead and liaise with the relevant noise making authorities to determine what measures if any are to be taken.
3. Defra, as competent authority, would work with the relevant noise making authorities encouraging them to consider what further measures might be taken. At the same time Defra would facilitate liaison with local authorities. Under this option three approaches to identifying the important areas were considered:
 - a) Identify top 0.5% of populations exposed with priority given to exposure to 80dB(A) or more according to the noise maps;
 - b) Identify top 1% of populations exposed with priority given to exposure to 76dB(A) or more according to the noise maps; and
 - c) Identify the population with exposure to 65dB(A) or more according to the noise maps

Prioritisation Methodology

6.2 The prioritisation methodology will influence how much work has to be undertaken in the initial period. The costs are:

- Defra producing information for relevant authorities (has to be done – no option regardless of approach). Only the quantity is a variable.
- Examining the important areas
- Evaluating what is to be done
- Consultation (at a local level)
- Writing up

6.3 The smaller the number of important areas, the smaller the cost but the greater the accusation of not enough being done.

7. Analysis of the Costs and Benefits

Methodology for Assessing the Costs and Benefits

7.1 For clarity the choices of how to implement noise action plans has been separated into two key decisions.

- The first decision relates to who will take the lead in co-ordinating the implementation of noise action plans. The three potential options identified were the relevant noise makers, Local Authorities or Defra working with both the noise makers and affected local authorities.
- The development of a methodology to identify the important areas.²

7.2 Given the differing nature of these two decisions different approaches were adopted to considering the options identified. In relation to the choice for responsibility, this work does not lend itself to a quantitative analysis and therefore the different options were considered qualitatively. To inform this decision the strengths and weaknesses of the different potential routes were identified. These considerations are presented below in the costs and benefits sections.

7.3 In relation to establishing a methodology for identifying important areas, the noise maps provides a key tool by allowing the identification of areas either by sound levels or by the corresponding population exposure. In fact the Regulation require that the maps be used for this purpose. Each of these measures provides a key incite to the situation in an area with noise levels providing an absolute picture while relative levels can be used to consider differentials within an area. To reflect fully this information it was decided to use a combination of both the absolute and relative levels to prioritise areas. Therefore the key variable in prioritisation became setting the relevant thresholds to identify areas both on the absolute and relative noise levels within agglomerations.

7.4 The cost of Action Plans can be broadly separated into two key categories: the central costs to set up the Action Plan framework; and the variable costs to investigate priority areas. With regard to any subsequent actions, it is presumed that no measure will be implemented unless it can be shown to have a positive benefit or at worst be cost neutral.

7.5 The central costs are incurred irrespective of the parameters used to prioritise areas as long as action planning is pursued. Therefore these costs do not change with these parameters and therefore are constant between the different implementation options. These costs include the consultancy and time cost to the Secretary of State of identifying and distributing information regarding the important areas.

7.6 Owing to these location specific features of the areas it will only be possible to undertake a detailed assessment of any areas once they have been identified and the potential mitigation options appraised. When investigating the important areas identified for action planning there are a range of impacts that will need to be assessed including:

- Investigating identified priority sites – Those bodies identified in the Action Plans will assist the competent authority in this stage of the process. This may entail visiting identified sites and forming a view regarding what further noise mitigation might be implemented in the context of sustainable development. The cost of this will be the time costs of carrying out investigations, reporting back the results, and available capacity.
- Consideration and assessment of potential mitigation options – This will be a time cost for the bodies identified in the Action Plans. This will be the time associated with carrying out the assessment and considering different mitigation options.
- Implementation of any identified mitigation measures – The decision to undertake mitigation measures will be taken locally, based upon some assessment of the costs and benefits of the measures. As the decision

² The consideration of this element assumes that Defra take the lead role. If this was not the preferred option, this element of identifying important areas would still have to be implemented and it is likely that Defra would have some role to play in guiding the other parties..

will be taken locally, we assume that measures will only be undertaken if they are of net benefit to the local community (or at worst cost neutral). Box 1 below does contain an example of a noise mitigation measure and how the costs and benefits might be assessed.

- The main potential benefit is being certain that noise management is being properly implemented and where necessary, there is a reduction in exposure to noise as a result of noise mitigation measures being implemented. The competent authority will liaise with the local bodies identified in the Action Plans on the investigation and assessment of important areas and possible actions, and of any actions which are ultimately taken. These assessments, and the documentation prepared to accompany them, will enable the competent authority to evaluate the measures undertaken and assess the resulting benefits. The box below indicates how these mitigation measures might be assessed.

Box 1 – Local assessment of noise mitigation measures

There are a number of different options for mitigating noise from an existing source¹. These fall into three broad categories:

- Reducing noise at source, such as, for road traffic noise, the installation of low noise road surfaces or seeking the greater use of low noise tyres
- Reducing propagation of noise, such as the installation of noise barriers
- Reducing noise at the receiver, such as the installation of specific sound insulation measures at the affected property

The benefits of noise mitigation projects can be quantified and valued by estimating the reduction in the annoyance that is caused by the noise. The Interdepartmental Group on Costs and Benefits – Noise subject group (IGCB(N))² is looking to develop a methodology for valuing noise pollution. The Webtag³ guidance provides a relationship between noise and annoyance and attaches a monetary valuation to noise reductions. There are a number of other impacts from environmental noise which are not currently valued, such as direct health effects. (Defra is currently undertaking research looking at the strength of evidence in this area). There may also be effects on productivity as a result of sleep disturbance and effects on the natural environment and ecosystems. There is currently no means of monetorising these effects, although an outcome of sleep disturbance may be reflected in the extent of annoyance felt.

An example of monetorising a noise mitigation action is given below:

Providing specific sound insulation measures for a single property

Measure	Installing a single leaf 3m barrier timber reflective noise barrier to protect
Cost of Measure	Approximately £2,800 per dwelling
Acoustic Effect	Benefit (approximately) 10 dB(A)
Monetised benefit (30 years) based on Webtag for a single dwelling ¹	80 to 70 dB(A) £16,400 76 to 66 dB(A): £14,400 65 to 55 dB(A): £9,900
Net Benefit (30 years) for a single dwelling	£7,100 - £13,600.

¹ The presented figures only provide key noise levels however the same analysis has been undertaken for all relevant noise levels

Sources:

1. "Inventory of Noise Mitigation Measures", 2002, European Commission
2. IGCB(N) website - <http://www.defra.gov.uk/environment/noise/igcb/index.htm>
3. http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

7.7 To provide a broad approximation of the impacts of setting different thresholds, analysis has been undertaken to estimate the potential scale of the options.

7.8 In undertaking such an analysis the two key factors that need to be estimated are the number of areas where investigations will occur under each threshold and the potential impacts in each area.

7.9 To estimate the number of areas where investigations would occur noise mapping data have been used to estimate the number of households that would be identified as being an important area under the different thresholds. The noise mapping data used are taken from the strategic noise maps produced for the Secretary of State, and for this impact assessment, those maps relating to road traffic noise in particular, both as a major source, as defined by the regulations and in first round agglomerations. More information on the noise mapping is available from <http://noisemapping.defra.gov.uk/cara/wps/portal/noise/>.

7.10 . The numbers shown have been calculated by first identifying the proportion of the affected population (0.5% and 1% for options 3(a) and 3(b) and respectively) and then of those people those that are exposed to noise levels above the set threshold (80dB(A), 76dB(A) for options 3(a) and 3 (b) respectively and for Option 3 (c) 65dB(A) respectively).

7.11 These figures have been limited to the impacts of in connection with road traffic noise. This is because the potential number of important areas for road traffic is much larger than for railway noise.. Furthermore, as rail noise is recognised to affect a much smaller proportion of the population, its exclusion would not change the scale of the impacts of these decisions.

7.12 In reviewing the consequences of different threshold levels, it has not been possible to take account of the detailed geographical distribution of the locations above the threshold. Instead the focus has been on the number of people affected and not their detailed location. It could be that the people above the threshold in an area could be in relatively close proximity and affected by a particular source. The investigation of this area would be easier, simpler (and less costly) than if the people above the threshold are geographically dispersed. Under this situation the time involved in investigating the locations would be longer and hence costlier. Where there are a large number of households in a small area that is affected by the same noise source it is more likely that any mitigation measures would have benefits that outweigh the costs.

7.13 In order to take account of this aspect of the process an estimate has been made of the possible costs of investigating the various locations, forming a view regarding what measures, if any, might be taken, liaising and consulting with relevant stakeholders and drawing a conclusion. The process would follow the elements set up in para 7.6 above. It has been assumed that for the various noise making authorities, the various important areas are not far from their regional or local offices. It has been estimated that this process would cost of around £6,000 to consider the situations covering 600 dwellings . This gives a cost of around £10 per dwelling investigated.. This is the figure that has been used in the assessment.

7.14 Overall, there are a number of factors which will affect whether mitigation has a net benefit but this factor has been highlighted as the costs and benefits calculated below will not take it into account.

7.15 While these figures provide an estimate of the potential action it is important to reflect that in practice not all the identified important areas will lead to action. There are many reasons why an important area might not warrant action including

- There is no scope for implementing additional noise mitigation measures within the context of sustainable development;
- The cost of mitigation is disproportionate to the potential benefits; and
- Fiscal constraints on the body required to undertake the mitigation actions.

7.16 Having identified the potential number of households affected it is then necessary to estimate the potential impacts. The impacts will depend on a range of local factors and so cannot be robustly estimated at this stage. However, the range of potential benefit can be derived by making assumptions regarding the proportion of important areas that will attract mitigation measures and using the data in Box 1 to quantify them. This assessment was only applied to the favoured option (3(b)).

7.17 Table 1 below shows the net benefit over 30 years of applying mitigation to 2%, 5% and 10% of the dwellings that were identified as being important areas (exposed to 76 dB(A) or over) in option 3 (b).

Table 1
Indication of potential net benefit over 30 years

Case	Approx No of Dwellings	Net Benefit (£m)
2%	1150	13.5
5%	2875	34
10%	5750	67.5

7.18 The reason why it is expected that not all locations will attract new mitigation is that for the last 35 years, existing noise management policies have been in place. For example, the Noise Insulation Regulations 1975 (amended 1988) provided compensation for those dwellings affected by new or improved highways subject to certain criteria. A similar set of regulations were implemented in 1996 for railways. Since 1973, planning circulars have provided guidance on the suitability of sites for noise sensitive premises, requiring that sound insulation or other mitigation is provided based on the prevailing noise levels. Consequently, it is expected that many locations close to major sources experiencing the higher noise levels will have already benefited from noise mitigation measures. However, it is known that this is not always the case, and the implementation of the Environmental Noise (England) Regulations 2006 puts in place a process to address those locations experiencing the higher noise as a first priority where further noise management is required.

7.19 In addition to the impacts of actions to mitigate noise, the cost of preparing the associated data should also be considered. The consultancy and time cost to the Secretary of State of preparing the action plans are currently estimated to be in the range of £400,000 to £500,000, with a central value of £470,000³.

Cost Benefit analysis

7.20 The consideration of the various options have been based on the following principles:

Throughout the implementation of these Regulations, there has been a wish by some stakeholders that the overall approach should be less centralised. The basis for this desire is the consideration that local solutions for local problems is the best approach. However, given that implementation of the Directive is a legal requirement, it has been felt that maintaining central government control would ensure that the process is implemented in a timely and effective manner. This was proven during the noise mapping phase whereby the centralised approach delivered the noise maps on time. In fact the UK is one of only 4 Member States to have fully reported the results of the noise mapping to the satisfaction of the European Commission. Other Member states who devolved the relevant responsibilities have encountered delays. Maintaining a centralised approach in the action planning is likely to encounter similar criticisms, but as will be seen there are compelling arguments for continuing with this approach

With a centralised approach, there is a risk that local councils will feel excluded from the process. Adopting the option that gives them the opportunity for involvement will address this fear and to an extent mitigate the consequences of keeping a centralised approach

Option 1 – Noise makers made responsible for addressing the sources

7.21 Providing responsibility to noise makers to deliver noise action plans has a range of potential advantages and disadvantages. These are presented below.

Advantages

- Noise making authorities have the responsibility to address important areas and already have the power to identify and promote noise management measures.
- Polluter Pays Principle followed. It can be argued that the authorities responsible for the transport network are the polluters.
- Responsibility devolved away from central Government.

Disadvantages

³ Cost estimate is based upon estimates of consultancy and staff time cost to central government. This is based upon an 8 month call off contract with expert consultants plus internal staff costs. Internal staff costs based upon assumption of 70% FTE of a Grade 7, 75% of two SEOs, 40% of an HEO and 30% of an AO

- No central control over the timeliness of the process. The Secretary of State is the Competent Authority. Adopting this approach would mean that the Competent Authority would not have control over the timeliness of the process.
- Local council involvement not guaranteed. Local councils should have the opportunity to be involved in the process, commenting on the proposals and possibly lobbying for alternative or additional measures.
- Some noise making authorities may not prioritise this work sufficiently to enable it to be completed in a timely manner.. The Secretary of State is the Competent Authority and adopting this approach would mean that the Competent Authority would not have control over the effective implementation of the process.
- Could be delays that could lead to infraction. Preparing and adopting action plans according to a timetable is a legal duty under European Law. Failure to do so could lead to infraction.

Summary

7.22 . This option was rejected because despite the desirability of the advantages identified, the disadvantages, especially the uncertainty of whether the noise making authorities would fulfil their obligations, and the lack of guaranteed local authority involvement ,outweighed them.

Option 2 – Local Authorities take lead and liaise with the relevant noise making authorities

7.23 Providing responsibility to Local Authorities to deliver noise action plans has a range of potential advantages and disadvantages. These are presented below.

Advantages

- Much more local council involvement.
- Noise making authorities have to address important areas and already have the power to identify and promote noise management measures.
- Polluter Pays Principle followed. It can be argued that the authorities responsible for the transport network are the polluters.
- Responsibility devolved away from central Government

Disadvantages

- A clear additional burden on local councils. Placing the responsibility on local authorities to lead this process would be an additional burden.
- Local councils have to rely on co-operation from noise making authorities.
- No central control over the timeliness of the process. The Secretary of State is the Competent Authority and adopting this approach would mean that the Competent Authority would not have control over the timeliness of the process.
- Some local councils may not prioritise this work sufficiently to enable it to be completed in a timely manner. The Secretary of State is the Competent Authority and adopting this approach would mean that the Competent Authority would not have control over effective implementation of the process.
- Could be delays that could lead to infraction. Preparing and adopting action plans according to a timetable is a legal duty under European Law. Failure to do so could lead to infraction.

Summary

7.24 This option was rejected because despite the desirability of the advantages identified, the disadvantages, especially the additional burden that would be placed on local authorities and the uncertainty over the timeliness of the process, outweighed them.

Option 3 – Defra liaise with noise making authorities and Local Authorities

7.25 Providing a co-ordinating role to Defra to help deliver noise action plans has a range of potential advantages and disadvantages. These are presented below.

Advantages

- Defra is the competent authority and with this involvement can monitor timeliness of progress. The Secretary of State is the Competent Authority. Adopting this approach would mean that the Competent Authority would have control over the timeliness of the process.
- Noise making authorities have to address important areas and already have the power to identify and promote noise management measures.
- Polluter Pays Principle followed. It can be argued that the authorities responsible for the transport network are the polluters.
- Local council involvement facilitated at a minimal extra burden. Reviewing proposals by third parties is part of the everyday function of local councils. Thus local councils have the ability to become involved but not in the form of a specific additional burden
- Much reduced risk of delay and infraction. Preparing and adopting action plans according to a timetable is a legal duty under European Law. Failure to do so could lead to infraction.

Disadvantages

- More centralised approach. However, the Secretary of State is the Competent Authority and adopting this approach would mean that the Competent Authority would have control over the timeliness and effective implementation of the process.

Summary

7.26 This option addresses all the disadvantages of the other options at the cost of additional central Government involvement. However, as the Secretary of State is the Competent Authority, this is judged to be acceptable.

Conclusion

7.27 It can be seen that Option 3 is the preferred option regarding the process of developing Noise Action Plans. Informal discussions have occurred with representatives of the noise making authorities and local councils and they were content with this approach.

7.28 As indicated above, noise making authorities all have an underlying duty to consider noise issues as part of their overall responsibility. The process described here merely focuses that aspect of their duty to this particular activity. Within the Environmental Noise (England) Regulations 2006, Regulation 21 requires the relevant public authority to treat any action arising from an action plan as policy insofar as it relates to that action.

Option 3a – Low protection (noisiest 0.5% in agglomeration with priority for those locations exposed to 80dB(A) or more according to the noise maps)

7.29 This option would identify the top 0.5% of the population as priority areas with additional emphasis placed on areas with noise exposure of 80dB(A) or more according to the noise maps. This prioritisation would focus resources extremely tightly on the areas with the very highest noise exposure.

7.30 Table 2 below provides the estimate of the population and number of dwellings that would be identified as important areas for noise action plans.

7.31 (In Tables 2,3 and 4 below:

The number of dwellings has been rounded to the nearest 50, except when the number of dwellings is greater than zero but less than 50, in which case the total has been shown as “<50”.

The associated population has been rounded to the nearest 100, except when the associated population is greater than zero but less than 100, in which case the total has been shown as “<100”.

The totals may not appear to add up due to rounding.)

Table 2: Estimated number of households identified as priorities by agglomeration and for major roads outside agglomerations.

Agglomerations	Number of dwellings	Number of people
Birkenhead	<50	<100
Blackpool	0	0
Bournemouth	0	0
Brighton	100	200
Bristol	<50	<100
Coventry	<50	<100
Kingston Upon Hull	0	0
Leicester	<50	<100
Liverpool	50	<100
Manchester	600	1000
Nottingham	<50	<100
Portsmouth	100	200
Potteries	0	0
Preston	<50	<100
Reading	50	<100
Southend	0	0
Sheffield	<50	<100
Southampton	100	200
Teesside	<50	<100
Tyneside	<50	100
West Midlands	150	300
West Yorkshire	<50	<100
Greater London Urban Area	650	1,400
Major Roads outside Agglomerations	3,150	7,500
Total	5,100	11,300

7.32 Under this option around about 5,000 dwellings affecting around 11,000 people would be prioritised. If action were undertaken for all these properties as indicated in Box 1 it would generate a net benefit of around £69.2m over 30 years.

7.33 However, in practice it is likely that the realised impacts would be substantially below this figure. There are many reasons for this including:

- There is no scope for implementing additional noise mitigation measures at particular locations within the context of sustainable development;
- The cost of mitigation is disproportionate to the potential benefits; and
- Fiscal constraints on the body required to undertake the mitigation actions.

7.34 In addition to the impacts of actions to mitigate noise the cost of preparing the associated data should also be considered. The consultancy and time cost to the Secretary of State of preparing the action plans are currently estimated to be in the range of £400,000 to £500,000, with a central value of £470,000⁴. Furthermore based on para 7.13, the cost of investigating the important areas under this option is just over £50,000. Given the small potential benefits of these criteria it is unlikely that such criteria would provide a reasonable return on this investment.

7.35 For the reasons given the impact estimates have been produced assuming action occurs at 2 per cent or 10 per cent of dwellings. For the central case presented in the cover sheets 2 per cent has been assumed, no additional mitigation and 10 per cent is then included as a sensitivities. The impacts of these actions over 30 years are presented in table 3 below.

⁴ Cost estimate is based upon estimates of consultancy and staff time cost to central government. This is based upon an 8 month call off contract with expert consultants plus internal staff costs. Internal staff costs based upon assumption of 70% FTE of a Grade 7, 75% of two SEOs, 40% of an HEO and 30% of an AO

Table 3: Estimated mitigation impacts by proportion of dwellings requiring noise mitigation (above 80dB(A)).

	Net benefit (£ million)	Benefit (£ million)	Cost (£ million)
No additional mitigation	-£0.5	£0	£0.5
Two per cent action	£0.8	£1.7	£0.9
Ten per cent mitigation	£6.4	£8.3	£1.9
One hundred per cent mitigation	£68.7	£83.4	£14.7

Option 3b – Central protection (noisiest 1% in agglomeration with priority for those locations exposed to 76dB(A) or more according to the noise maps)

7.36 This option expands the criteria for inclusion to include the top 1 per cent of those exposed with priority given to people exposed to levels of 76 dB(A) or more according to the noise maps. Table 4 below provides the estimates of the population and number of dwellings that would be identified by these criteria as important areas.

Table 4: Estimated number of households identified as priorities by agglomeration.

Agglomerations	Number of dwellings	Number of people
Birkenhead	150	300
Blackpool	0	0
Bournemouth	50	100
Brighton	2,150	3,900
Bristol	500	900
Coventry	350	800
Kingston Upon Hull	100	100
Leicester	250	700
Liverpool	2,850	5,700
Manchester	8,700	16,500
Nottingham	1,400	2,600
Portsmouth	1,400	3,000
Potteries	150	300
Preston	100	200
Reading	950	1,600
Southend	150	300
Sheffield	250	500
Southampton	800	1,800
Teesside	<50	<100
Tyneside	400	900
West Midlands	2,150	4,700
West Yorkshire	850	1,800
Greater London Urban Area	13,300	27,100
Major Sources outside Agglomerations	20,550	48,600
Total	57,500	122,500

7.37 These changes in the criteria significantly increase the scope of the important areas. In total over 57,000 dwellings would be identified as priorities for consideration. If all these dwellings after inspection did justify noise mitigation activity the net benefit, based on the data in Box 1 would be £730m over 30 years. .

7.38 Again in practice it is likely that the realised impacts would be substantially below this figure. There are many reasons for this including:

- There is no scope for implementing additional noise mitigation measures at particular locations within the context of sustainable development;
- The cost of mitigation is disproportionate to the potential benefits; and
- Fiscal constraints on the body required to undertake the mitigation actions.

7.39 In addition to the impacts of actions to mitigate noise the cost of preparing the associated data should also be considered. The consultancy and time cost to the Secretary of State of preparing the action plans are currently

estimated to be in the range of £400,000 to £500,000, with a central value of £470,000⁵. Furthermore based on para 7.13, the cost of investigating the important areas under this option is just over £0.5 million. However, given the potential benefits set out above it seems likely that the resultant noise management action would provide a reasonable return on this investment.

7.40 For the reasons given the impact estimates have been produced assuming action occurs at 2 per cent or 10 per cent of dwellings. For the central case presented in the cover sheets 2 per cent has been assumed and 10 per cent is then included as a sensitivity. The impacts of these actions over 30 years are presented in table 3 below.

Table 5: Estimated mitigation impacts by proportion of dwellings requiring noise mitigation (above 76dB(A)).

	Net benefit (£ million)	Benefit (£ million)	Cost (£ million)
No additional mitigation	-£1.0	£0	£1.0
Two per cent action	£13.6	£17.5	£3.9
Ten per cent mitigation	£73.1	£87.7	£15.7
One hundred per cent mitigation	£730.5	£877.2	£147.7

Option 3c – High protection (priority for those exposed to 65dB(A) or more according to the noise maps)

7.41 The final option would expand the important areas to include population exposed to noise levels of 65 dB(A) or more, according to the noise maps. Table 4 below provides estimates of the total number of dwellings that would be identified as important areas given these criteria.

Table 4: Estimated number of households identified as priorities by agglomeration.

Agglomerations	Number of dwellings	Number of people
Birkenhead	15,000	31,300
Blackpool	7,450	16,500
Bournemouth	12,400	24,400
Brighton	54,900	115,800
Bristol	20,750	41,300
Coventry	6,000	13,900
Kingston Upon Hull	5,550	11,300
Leicester	13,050	30,000
Liverpool	50,200	107,500
Manchester	176,900	368,400
Nottingham	22,300	48,400
Portsmouth	38,000	83,900
Potteries	8,600	18,000
Preston	8,800	19,100
Reading	29,300	68,000
Southend	8,600	16,800
Sheffield	18,400	38,800
Southampton	24,000	55,100
Teesside	7,650	16,800
Tyneside	24,950	51,100
West Midlands	74,800	162,300
West Yorkshire	44,100	96,700
Greater London Urban Area	585,800	1,302,000
Major Sources outside Agglomerations	606,200	1,398,700
Total	1,863,550	4,136,100

7.42 Table 4 shows that using these criteria a total of just under 1.9m dwellings involving over 4m people would be identified as important areas for investigation for noise action plans. If action were undertaken for all these properties as indicated in Box 1 it would generate a net benefit of around £17.3 billion over 30 years.

⁵ Cost estimate is based upon estimates of consultancy and staff time cost to central government. This is based upon an 8 month call off contract with expert consultants plus internal staff costs. Internal staff costs based upon assumption of 70% FTE of a Grade 7, 75% of two SEOs, 40% of an HEO and 30% of an AO

7.43 However, in practice it is likely that the realised impacts would be substantially below this figure. There are many reasons for this including:

- There is no scope for implementing additional noise mitigation measures at particular locations within the context of sustainable development;
- The cost of mitigation is disproportionate to the potential benefits; and
- Fiscal constraints on the body required to undertake the mitigation actions.

7.44 For the reasons given the impact estimates have been produced assuming action occurs at 2 per cent or 10 per cent of dwellings. For the central case presented in the cover sheets 2 per cent has been assumed and 10 per cent is then included as a sensitivity. The impacts of these actions over 30 years are presented in table 3 below.

Table 3: Estimated mitigation impacts by proportion of dwellings requiring noise mitigation (above 80dB(A)).

	Net benefit (£ billion)	Benefit (£ billion)	Cost (£ billion)
No additional mitigation	-£0.02	£0	£0.02
Two per cent action	£0.3 ¹	£0.5	£0.1
Ten per cent mitigation	£1.7	£2.3	£0.5
One hundred per cent mitigation	£17.3	£22.5	£5.2

¹ This figure does not add up in this table owing to the level of rounding

7.45 The cost of investigating this number of locations would £19m. This is felt to be an aspirational goal based on the numbers involved, and the associated investigatory costs. Furthermore, given that the Regulations effectively operate on a 5 yearly cycle, there would be an expectation that this round of investigations would be completed in this timescale. This is not felt to be possible. It is anticipated that once the work has been completed as set out in option 3b, the next round of action planning would consider lower noise levels.

8. Conclusion

8.1 It is recommended that the important areas are those where the top 1% of the population are affected by the highest levels of noise, but as a priority, attention being focussed on those locations with a noise exposure of 76 dB(A) or more ($L_{A10,18h}$ for road traffic) according to the noise maps⁶. This is seen to be a pragmatic and practicable approach to identifying important areas.

8.2 It is recommended that the process would be lead by Defra, as Competent Authority, encouraging the noise makers to investigate the important areas and to form a view over what further measures might be taken to improve the management of noise in the context of sustainable development. Concurrently, Defra will facilitate the involvement of the relevant local councils to enable their participation in the process.

⁶ The equivalent threshold for railways is 73 dB(A), $L_{Aeq,18h}$

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	<i>Results in Evidence Base?</i>	<i>Results annexed?</i>
Competition Assessment	No	No
Small Firms Impact Test	No	No
Legal Aid	No	No
Sustainable Development	No	No
Carbon Assessment	No	No
Other Environment	Yes	No
Health Impact Assessment	No	No
Race Equality	No	No
Disability Equality	No	No
Gender Equality	No	No
Human Rights	No	No
Rural Proofing	No	No

Annex 1: Specific Impact Tests

Competition Assessment

A.1 The decision to introduce an action plan should pass the competition filter for not having a distortive impact

Small Firms Impact Test

A.2 There is no real distinction between business based on size and so this should be a no

Legal Aid

A.3 Unlikely to be a legal aid implications

Sustainable Development

A.4 Sustainable development is included (or will be) in the main analysis

Carbon Assessment

A.5 Carbon assessment will be insignificant

Health Impact Assessment

A.6 Health impact should be negligible excluding any direct impacts of noise on health

Race Equality

A.7 The equity issues should be positive as disadvantaged people typically suffer disproportionately from environmental pollution

Disability Equality

A.8 The equity issues should be positive as disadvantaged people typically suffer disproportionately from environmental pollution

Gender Equality

A.9 Noise is unlikely to have a particular impact on different genders.

Human Rights

A.10 Improvements in noise levels should contribute to promoting human welfare and therefore should not have an averse impact on human rights.

Rural Proofing

A.11 Rural proofing should not be a problem as they have low noise levels