



Kildare Local Authorities Second Noise Action Plan

July 2013

**Kildare County Council,
Áras Chill Dara,
Devoy Park,
Naas,
Co. Kildare**

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Kildare Local Authorities

Noise Action Plan

**For the second round of noise action planning under the
Environmental Noise Regulations 2006**

Published by Kildare County Council

**Kildare Local Authorities consist of Kildare County Council, Naas and
Athy Town Councils**

Acknowledgements

Kildare Local Authorities would like to thank iSoniq and AWN Consulting for their contribution in compiling the first Noise Action Plan on which this document is based.

Document Control

Change Record

Date	Author	Version	Change Reference
28/02/2013	GD	1.0	Draft for review
24/04/2013	GD	2.0	Final Draft
5/07/2013	GD	3.0	Final Report

EXECUTIVE SUMMARY

This Noise Action Plan has been prepared in accordance with the requirements of the Environmental Noise Regulations 2006, Statutory Instrument 140 of 2006. These Regulations give effect to the EU Directive 2002/49/EC relating to the assessment and management of environmental noise.

The aim of the document is to provide an overview of the requirements of the Regulations, to review the results of the strategic noise mapping within Kildare Local Authorities (Kildare County Council, Naas and Athy Town Councils) and to set out an approach to the strategic management and control of environmental noise over the next five years.

The objectives of the Kildare Local Authorities Noise Action Plan are to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, due to long term exposure to environmental noise. This will be achieved by taking a strategic approach to managing environmental noise and following a balanced approach in the context of sustainable development.

The Regulations set out a requirement for the assessment of noise impact during 2012 through the use of strategic noise maps. In Kildare, the noise maps for national roads were completed by the NRA, for non-national roads by Kildare County Council/NRA and for major rail by the Iarnród Éireann. The results of this noise assessment have been presented as maps and summary tables of statistics showing the estimated area, number of dwellings and people exposed to long term road and rail traffic noise within the area covered by the noise mapping.

This Noise Action Plan primarily considers the long term environmental noise impact from road and rail traffic noise sources, and sets out an approach to

review noise impact levels near to the major sources assessed during the strategic noise mapping in 2012 with a view to identifying locations where noise reduction is deemed necessary in the first instance. The process then goes on to undertake an assessment of potential noise mitigation measures which are then subject to a cost benefit analysis in order to result in recommendations for viable, cost effective, noise mitigation action.

The noise action plan proposes noise levels for the onset of this assessment of 70 dB L_{den} , and 57 dB L_{night} . An initial assessment indicates that there are an estimated 969 people above the L_{den} threshold for noise from road traffic sources, and an estimated 5564 people above the L_{night} threshold - 3674 from road traffic sources and 1890 from rail traffic sources.

In the interests of equality, and promotion of best practice, the action plan also sets out a number of proposals for the prevention and avoidance of increasing levels of environmental noise considered detrimental to human health, to be implemented through the planning process, which are to be applicable throughout County Kildare.

SUMMARY OF ACTIONS

Planning & Development

Increased levels of environmental noise will be prevented and avoided, where possible, within the requirements of the Development Plan, Local Area Plans and sustainable development, through the whole of County Kildare, by integration of noise management into the planning process for the development of new noise sensitive premises, or sources of long term environmental noise, such as road, railways and industrial sites.

- Review County Planning development and planning guidance regarding noise control

- Desire to see noise impact assessments of proposed developments which are below the scale associated with full EIA requirements
- Desire to see noise control measures incorporated into proposals for new developments of noise sensitive premises which attain appropriate internal noise targets
- Assess implementation and use of guidance on planning and noise
- Design regional roads in accordance with the NRA *Guidelines on Treatment of Noise*.

Noise Reduction of Existing Sources

In an ideal world, sufficient funding would be provided to mitigate the effects of adverse environmental noise across the county. In practice, the absence of funding means that any noise reduction from existing sources will most likely come from road maintenance activities which are prioritised on the basis of road condition, levels of traffic and road safety considerations rather than noise levels. It is therefore unlikely that a significant number of people will have an improved noise environment.

The assessment of relevant actions will use the following approach:

- Review strategic noise maps to identify priorities through use of a decision support matrix.
- Confirm the extent of the noise impact through refined noise modelling and/or noise monitoring
- Draw up list of areas for noise mitigation review
- Assess all identified sites

- Feasibility study for possible options for mitigation
- Cost benefit analysis for feasible measures
- Draw up list of cost effective interventions
- Undertake cost effective actions if funding is available.

Preservation of Quiet Areas

The preservation of relatively quiet areas in the vicinity of major noise sources, and quiet areas in the open countryside, will be considered and reviewed as part of the implementation of the noise action plan. Any possible designations which may be recommended by such a process would go to public consultation prior to submission to the Minister for adoption.

Planning for the Third Action Plan

- Prepare relevant information for 2017 strategic noise mapping
- Estimate extent of sources under 2017 strategic noise mapping
- Set out data requirements for 2017 strategic noise mapping
- Collate, capture and consolidate data required for 2017 strategic noise mapping
- Undertake an annual review of progress on implementation of the noise action plan.

Public Consultation & Draft Noise Action Plan

The Draft Action Plan went on public display and the public were invited to make submissions on its content between 26th April 2013 and 7th June 2013.

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1 Introduction

1.1 Background

This Second Noise Action Plan has been developed by Kildare Local Authorities (Kildare County Council, Naas and Athy Town Councils) in their role as designated Action Planning Authorities under the Environmental Noise Regulations 2006, Statutory Instrument Number 140 of 2006 (the Regulations).

It aims to provide an overview of the requirements of the Regulations, to review the results of the strategic noise mapping within County Kildare and to set out an approach to the strategic management and control of environmental noise over the next five years.

The Second Noise Action Plan is based on and follows the same approach as the first Noise Action Plan (2008)

A glossary of acoustic and technical terms used is set out in Appendix A.

1.2 Noise

Noise is typically defined as "unwanted sound", sound being pressure variations in the air which the human ear can detect. Sound levels are expressed in decibels (dB) on a logarithmic scale, where 0dB is nominally the "threshold of hearing" and 120dB is nominally the "threshold of pain".

One effect of using the decibel scale is that a doubling of the sound energy results in a 3 dB increase in the sound level. As illustrated in Figure 1.1 if one lawnmower produces a sound level of 60 dB, and we add a second one the same, we will measure a total of 63 dB. If we had 10 of these lawnmowers we would measure about 70 dB.

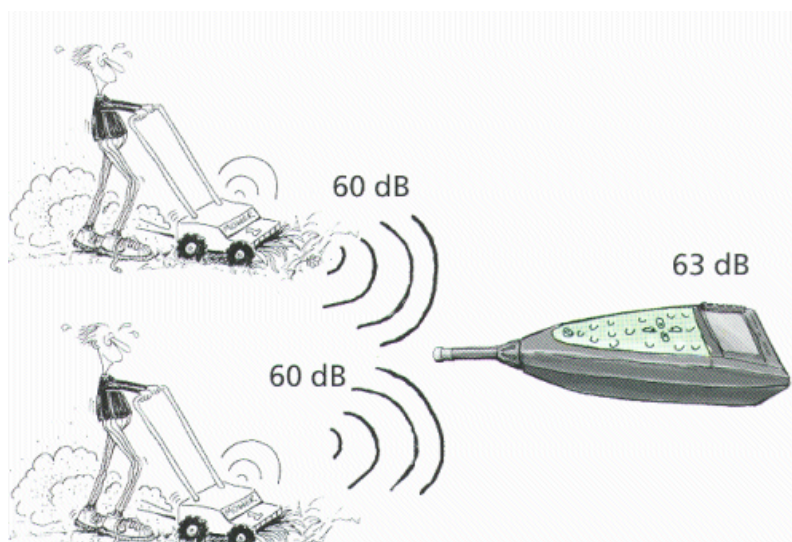


Figure 1.1: Twice the sound energy measures 3 dB more (Briel & Kjaer Environmental Noise Booklet, 2000)

Depending upon the circumstances and characteristics of the sound in question, a change in level of 3dB is just perceptible, whereas an increase of 10dB is perceived as a subjective doubling of loudness.

The frequency of sound is the rate at which a sound wave oscillates, and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. A mechanism known as "A-weighting" has been adopted in order to account for this nonlinearity of the human ear. Sound levels expressed using "A-weighting" are typically denoted dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 1.2, which shows a quiet bedroom at around 35 dB(A), a nearby noisy HGV at 90 dB(A) and a pneumatic drill at about 100 dB(A).

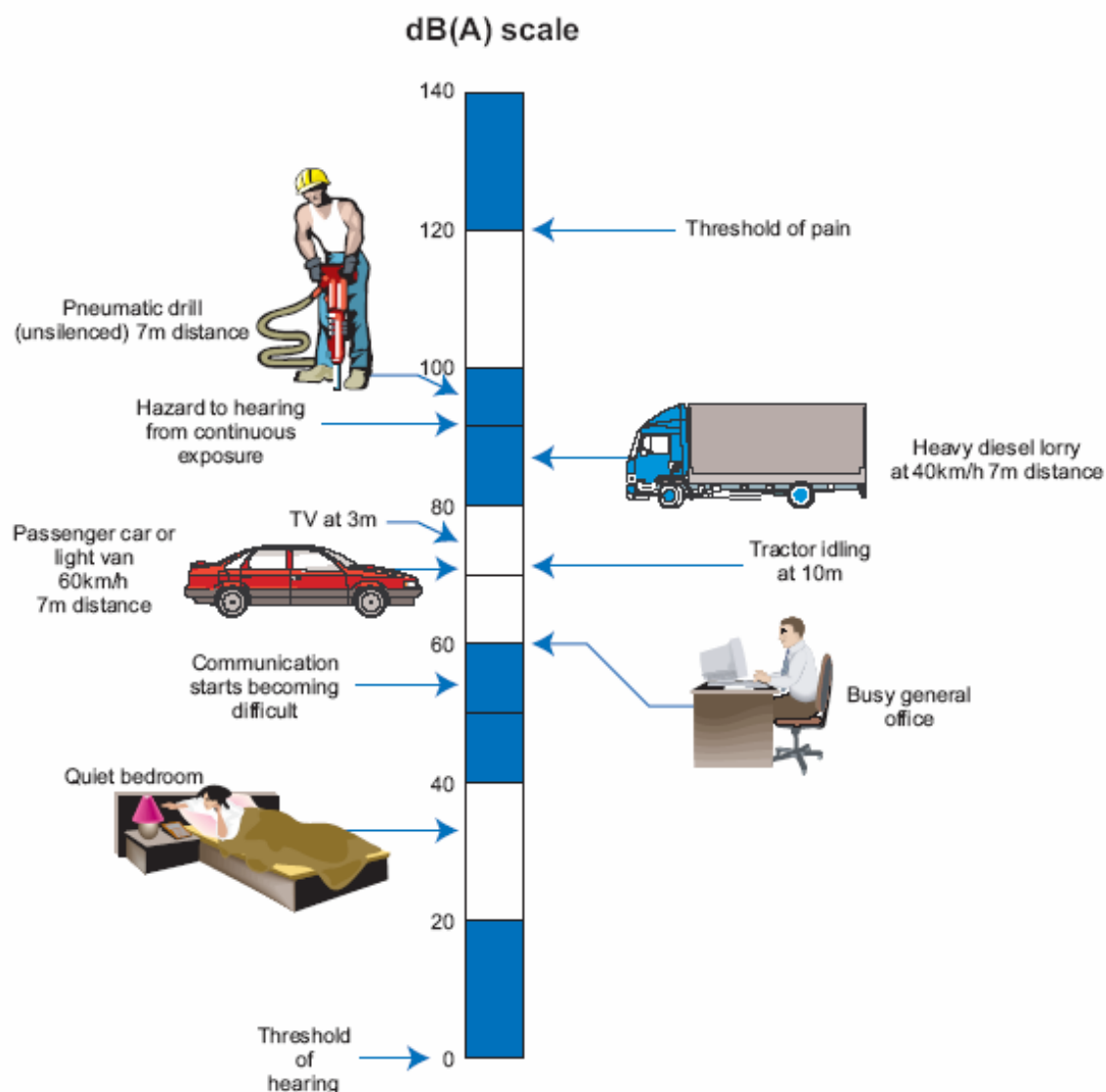


Figure 1.2: The level of typical common sounds on the dB(A) scale (NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004)

1.3 Noise Indicators

There are many ways of defining sound pressure levels through the use of statistical indicators. The choice of relevant indicator is often related to the type or nature of the sound being represented.

In order to provide a standardised approach to the description of long term environmental noise the Directive specifies the use of two noise level

indicators when preparing environmental noise maps and action plans; these two indicators are L_{den} and L_{night} . L_{den} is a noise rating indicator, rather than a sound level, and is based upon the day, evening and night time noise levels, with weightings applied for the different periods. L_{night} is typically used to assess sleep disturbance.

- L_{day} is the A-weighted long-term average sound level between 07.00 and 19.00
- $L_{evening}$ is the A-weighted long term-average sound level between 19.00 and 23.00
- L_{night} is the A-weighted long-term average sound level between 23.00 and 07.00
- L_{den} is the 24 hour noise rating level determined by the averaging of the L_{day} , with the $L_{evening}$ plus a 5 dB penalty, and the L_{night} plus a 10 dB penalty

The long term, annual average, day, evening and night values are determined and then combined to provide the indicated L_{den} yearly average. The penalties are applied to the evening and night time periods during the assessment of L_{den} to take into account evidence that response to noise levels is not uniform throughout the 24 hour period. For example a given indicated level of noise during the day may be deemed acceptable by the majority of people, however that same level of noise at night may be deemed less acceptable. The formula used to calculate L_{den} is presented in Appendix A.

1.4 Effects of Noise

There are many different effects of noise and individuals experience each of them to different degrees. It is known that noise can disturb human activity, by causing distraction or by physically interfering with it. WHO estimate that

at least one million healthy life years are lost from traffic related noise in Western European countries. The effects of noise can also include:

- General detection/distraction;
- Speech interference;
- Disruption of work/mental activity, and
- Sleep disturbance.

Any of these can lead to annoyance and possibly more overt reactions, including complaints.

In addition there are physiological effects that can occur, including stress and other health effects. The nature of these effects is much less certain, although it is known that noise can cause a variety of biological reflexes and responses referred to as stress reactions. Whether, over a period of time, these reactions could lead to clinically recognisable disease is unclear. The possibility that severe annoyance might itself induce stress cannot be ignored.

At the present state of technology, noise tends to be an inevitable consequence of a mature and busy society. People enjoy a benefit from road, rail and air transport and industrial processes, and this benefit manifests itself in terms of business, leisure, the movement of goods and employment. When managing the environmental noise that arises from transportation noise sources, a balance needs to be struck.

1.5 Purpose and Scope of the Directive

Directive 2002/49/EC of the European Parliament and of the Council relates to the assessment and management of environmental noise, and is commonly referred to as the Environmental Noise Directive or END.

The aim of the Directive is to establish a common approach across Europe intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise.

The Directive addresses the management of environmental noise issues and effects which arise from road traffic, railways, major industrial sites and aircraft departing from and arriving at airports.

The Directive does not apply to noise caused by an exposed person, noise from domestic activities, noise created by neighbours, noise at places of work, noise inside means of transport, or noise due to military activities in military areas.

In support of its aims, the Directive sets out a three stage approach:

- Undertake strategic noise mapping to determine exposure to environmental noise;
- Ensure information on environmental noise and its effects is made available to the public;
- Adopt action plans, based upon the noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good.

The END requires all European Union (EU) Member States to produce strategic noise maps for the main sources of environmental noise, i.e. major roads, major railways, major airports and all sources within agglomerations with a population of more than 100,000 persons in 2012 and subsequent rounds.

Strategic noise mapping was undertaken in Ireland during 2012 by the designated noise mapping bodies. They were required to undertake the assessment of noise levels from major roads, railways and airports across Ireland.

Using these noise level results with population distribution information the noise exposure of the population living within the assessment areas was estimated. The Environmental Protection Agency (EPA) was required to report to the European Commission relevant information on population exposure to noise. This information was delivered to the European Commission (EC) in December 2012.

Information on environmental noise and its effects, including the results of the strategic noise mapping and its effects, is available to the public from the EPA. This helps towards achieving the aims of the second stage of the Directive.

The third phase of the work under the Directive requires designated Action Planning Authorities to produce Action Plans for the second round in 2013 and every five years thereafter.

1.6 Purpose and Scope of the Regulations

The Environmental Noise Regulations 2006 were brought into effect by the Minister for the Environment, Heritage and Local Government to provide implementation of the Directive in Irish law.

The scope of the Regulations is the same as for the Directive and as such they do not have regard to neighbourhood noise, nuisance or noise from machinery used outdoors, which are addressed under separate legislation.

The Regulations designate certain organisations as responsible for the production of the strategic noise maps in the first stage and certain organisations as responsible for the development of action plans in the third stage of executing the requirements of the Directive.

1.7 Roles and Responsibilities of Designated Bodies

The Regulations designate the EPA as the national authority responsible for overseeing the implementation of the Regulations. The EPA is required to provide advice and guidance to the relevant noise mapping bodies and action planning authorities. The EPA is responsible for reporting to the European Commission the information relating to strategic noise mapping and action planning.

1.7.1 Noise mapping bodies

Under the Regulations the following organisations have been designated as noise-mapping bodies:

For the agglomeration of Cork - Cork City Council and Cork County Council;

For the agglomeration of Dublin - Dublin City Council and the County

Councils of Dun Laoghaire/Rathdown,

Fingal and South Dublin;

For major railways - Iarnród Éireann or the Railway Procurement Agency, as appropriate;

For major roads - The National Roads Authority, for national roads classified in accordance with Section 10 of the Roads Act 1993 (No.14 of 1993), and

The relevant road authority, or authorities, for major roads not classified as national roads;

For major airports - The relevant airport authority, on behalf of the action planning authority or authorities concerned.

1.7.1.1 Responsibilities

The Regulations state that the designated noise mapping bodies are required to make a strategic noise map no later than 30 June 2012, for each of the following areas, in respect of the calendar year 2011:

- An agglomeration with more than 100,000 inhabitants;
- Any major road with more than 3 million vehicle passages per year (approximately 8,220 per day);
- Any major railway with more than 30,000 train passages per year (approximately 82 per day); and
- Any major airport with more than 50,000 aircraft take-off or landing movements per year (approximately 137 per day).

The noise mapping bodies are to repeat the 2012 strategic noise mapping exercise each 5 years.

1.7.2 Action Planning Authorities

Under the Regulations the following organisations have been designated as action planning authorities:

For the agglomeration of Cork - Cork City Council and Cork County Council;

For the agglomeration of Dublin - Dublin City Council and the County Councils of Dun Laoghaire / Rathdown, Fingal, and South Dublin;

For major railways - The local authority or local authorities within whose functional area or areas the railway is located;

For major roads - The relevant local authority or local authorities within whose functional area or areas the road is located; and

For major airports - The local authority or local authorities within whose functional area the airport is located;

Accordingly, Local Authorities are designated as the Action Planning Authorities for all sections of major roads within their functional area which experience a volume of traffic greater than 3 million vehicle passages per year.

1.7.2.1 Responsibilities

Action planning authorities are responsible for the making and approving of action plans, in consultation with the EPA and the noise mapping body for the relevant noise map. Action plans must satisfy the minimum requirements set out in the Fourth Schedule of the Regulations which is based upon Annex V of the Directive.

Action planning authorities are required to ensure that:

- The public are consulted on proposals for action plans;
- The public are given early and effective opportunities to participate in the preparation and review of action plans;
- The results of public participation are taken into account in finalising action plans or reviews of action plans;
- The public are informed of the decisions taken in relation to action plans;
- Reasonable time-frames are adopted to allow sufficient time for each stage of public participation.

Summaries of the action plans are to be submitted to the EPA by 18 July 2013.

As with the strategic noise maps, the action plans are to be reviewed at least every 5 years after the date of their approval.

1.8 Key Phases

The Directive sets out a process design to provide a means of managing environmental noise in a consistent manner across the EU. The Regulations set out the approach to meeting the requirements of the Directive within Ireland. Responsibility for undertaking the phases of work required under the Regulations is shared between the noise mapping bodies and the action planning authorities.

The phases of the process may be considered a continuous cycle for which the current strategic noise maps and actions plans constitute the second pass through the process. Below is set out an overview of how the work has been undertaken.

1.8.1 Identification of areas required to be mapped

Section 3.2 describes how the noise mapping areas were identified and which areas were mapped within County Kildare.

1.8.2 Preparation of strategic noise maps

The approach set out within the Regulations is to first undertake strategic noise mapping within cities, then consider major sources outside cities and then assess the numbers of people exposed to noise within 5 dB noise level bands.

Section 5.1 describes the development of the strategic noise maps.

1.8.3 Publication of the extent of noise impact

Section 5 of this Action Plan presents a summary of the results of the noise mapping and the exposure analysis for the noise mapping undertaken within County Kildare.

1.8.4 Development of the noise action plans

In line with the Regulations, Kildare Local Authorities are responsible for developing a noise action plan as there are sections of major roads and major railways within the County area. Section 3 of this Noise Action Plan describes the sections of major road and major railway. There are no major airports within the county.

Section 9 sets out the approach to public consultation on the Noise Action plan which aims to provide members of the public and key stakeholders with an important opportunity to review, inform and affect the final approach set out within the Action Plan. The Action Plan will also include a review of the responses from the public consultation and information about how the process affected the proposed approach.

1.8.5 Implementation of the action plan

Section 10 of this Action Plan sets out the proposed approach to implementation of the action plan between 2013 and 2018. However, any action proposed is subject to the availability of funding.

2 Existing Noise Management

The Directive aims to prevent and reduce, where necessary, environmental noise through the adoption of action plans. The action plans are a means of managing environmental noise.

Within environmental noise there are a number of individual items which require consideration and management:

- New roads, railways, airports, industry or recreational activities adjacent to residential properties or noise sensitive premises such as schools, hospitals or recreational spaces;
- New residential properties or noise sensitive premises such as schools or hospitals, adjacent to existing roads, railways, airports, industry or recreational activities;
- The development of mixed residential/commercial use buildings, and multi-part residential buildings;
- The management of noise levels within noise sensitive properties, such as schools and hospitals, to address external noise break-in, as well as room to room transmission and noise levels within public spaces;
- Noisy neighbours, barking dogs;
- Gardening machinery, construction activities, ice cream vans and street cleaning;
- Air-conditioning equipment;
- Public house, night clubs, restaurants, hotels or other recreational activities; and
- Industrial operations, workshops and factories.

Many of the above aspects may be addressed in some way through the planning process for new or altered developments; however others may need to be addressed as noise nuisance issues where best practical means or best available technology approaches could be appropriate.

2.1 EU legislation

The EC is responsible for a number of important elements of legislation which contribute to the overall management of environmental noise. Below is a brief overview of the other key EC Directives relating to noise which are primarily related to the control of noise emission. Any noise control measures considered desirable which relate to emission from sources within the scope of these directives would require the EC to amend the relevant Directive, and then each Member State to adopt the amendment, before the desired effect would be experienced.

In this context it is important to note that Kildare Local Authorities will not be able to effect changes to this legislation.

2.1.1 Aircraft noise

2.1.1.1 Noise operation restrictions at EU airports – Directive 2002/30/EC

This Directive established rules and procedures with respect to the introduction of noise related operating restrictions at EC airports. This Directive implemented in EC legislation the so called “balanced approach” to managing aircraft agreed and recommended by International Civil Aviation Organisation (ICAO) since October 2001. The approach comprises four principal elements, including reduction of aircraft noise at source, land-use planning and management measures, noise abatement operational procedures and operating restrictions. In February 2008 the Commission adopted a report on the implementation of Directive 2002/30/EC.

2.1.2 Outdoor machinery – Directive 2000/14/EC

This Directive relates to the noise emission by equipment for use outdoors. It covers a wide range of hand operated equipment for use on construction sites or in gardens, such as lawnmowers and compressors, through to large construction machinery such as drilling rigs and loaders. There was an amendment issued as Directive 2005/88/EC which brought about a reduction in the noise limits for some types of machinery. The Directive has been enacted in Ireland as S.I. No. 632 of 2001, and the Amendment as S.I. No. 241 of 2006.

2.1.3 Railway noise

The management of railway noise by the EC is not via obligatory Directives, rather by non-obligatory Commission Decisions connected with the Directive 2001/16/EC on the interoperability of the trans-European conventional rail system. The decisions relate to the Technical Specification for Interoperability (TSI) which aims to enable movement of railway vehicles and carriages across national boundaries between Member States and provide for a uniform level of performance. In 2002 the EC adopted a decision relating to a TSI for high speed trains which included noise limit values, whilst it was in 2006 that noise limit values for rolling stock, including freight wagons, were first introduced.

2.1.4 Recreational craft – Directive 2003/44/EC

This Directive is an amendment to Directive 94/25/EC regarding the regulations relating to recreational craft, such as motorboats and powered water craft with an engine and exhaust system. The Directive sets out maximum permissible sound emission levels and describes a test procedure.

2.1.5 Road traffic noise

2.1.5.1 Motor vehicles - Directive 70/157/EEC

Permissible sound level and the exhaust system of motor vehicles, Directive 70/157/EEC, was originally brought into force in 1970, and has been amended on a number of occasions, the most recent being in June 2007 to

bring into force the new drive by noise test procedure and noise emission limits. Vehicle type approvals were presently carried out according to the test procedures specified in Directive 92/97/EC, which itself was an amendment of Directive 70/157/EEC. The test procedure involves driving an unladen vehicle over a specifically designed test surface laid in an open area, with the vehicle rapidly accelerating from a low speed in a low gear. The test has been criticised on the basis that full throttle acceleration is not representative of normal driving conditions. This led to a revised testing procedure being developed by the United Nations Economic Commission for Europe (UNECE) based upon noise emissions at approximately 75% of maximum engine speed. The new test procedure was adopted by the EC in 2007 and introduced into force by an amendment to Directive 70/157/EC in June 2007, setting a deadline of July 2008 for Member states to adopt the Directive as Regulations and bring them into force.

2.1.5.2 Motor cycles - Directive 97/24/EC

Annex I of the Directive sets out permissible noise limits for two and three wheel motor vehicles, including motorcycles and mopeds. There have been a number of amendments to the Directive, but none to date have altered the maximum permissible noise emission levels.

2.1.5.3 Type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor - Regulation No 661/2009

Under the framework of Directive 2007/46/EC this regulation establishes new maximum permissible rolling noise limits for tyres available on the market across Europe. This noise limits replace the previous limits set out within Directive 2001/43/EC. The new Regulation requires tyres to comply with more stringent limits on rolling noise emissions. Compliance with these new noise limits is mandated from 1st November 2012 for new types of tyre, from 1st November 2013 for new types of vehicle and from 1st November 2016 for all new tyres and vehicles. The new rolling noise limits are between 3 and 4 dB(A) lower than the previous limits.

2.1.5.4 Labelling of tyres with respect to fuel efficiency and other essential parameters – Regulation 1222/2009

In support of Regulation 661/2009 this Regulation establishes a framework for the provision of harmonised information on tyre parameters through labelling, allowing end-users to make informed choice when purchasing tyres.

As from 1 November 2012 the EU Energy labels for tyres must be available at point of sale and show information on fuel consumption, wet grip and rolling noise levels, as shown in Figure 2.1.

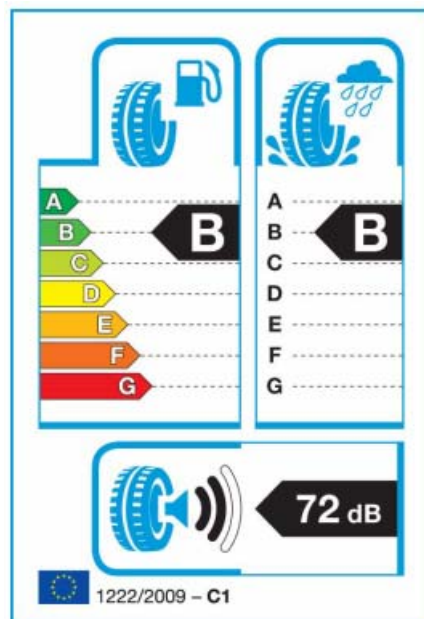


Figure 2.1: Example of EU Energy label for tyres

2.2 National legislation or guidance

Legislation and guidance within Ireland reflects the requirements of the EC Directives discussed above. As mentioned, many have been adopted into Irish statutory instruments to produce Regulations. In addition to these EC driven regulations, there are a number of other pieces of national legislation or guidance which relate to the management and control of environmental noise.

2.2.1 Environmental Protection Agency Act 1992

The existing statutory provisions have primarily come about on foot of the Environmental Protection Agency Act of 1992. The Act identifies noise as a form of environmental pollution and contains provisions for dealing with noise “which is a nuisance, or would endanger human health or damage property or harm the environment.” Sections 106 to 108 of the Act are of direct relevance to noise, and may be summarised as follows:

- Section 106 gives the relevant Minister certain powers to regulate noise that may give rise to a nuisance or be harmful to health or property. These powers may include imposing noise limits, either exceedance values or emission values, controlling sources of noise and the imposition of charges for noise pollution;
- Section 107 gives powers to local authorities and the EPA to serve notice to take steps to control noise from any premises, process or work;
- Section 108 sets out a process whereby noise issues may be taken to the District Court, which may make an order requiring that the person or body responsible for the noise takes steps to eliminate or ameliorate the noise in question.

The powers set out within the EPA Act largely relate to the control of noise nuisance, and therefore may be applicable to neighbourhood noise, music, industry or other such activities.

At present there is no statutory guidance on the application and use of the Act, however, within the framework of the Regulations the EPA does have the powers to develop such guidance.

2.2.2 The Roads Act 1993

The Roads Act 1993 grants powers to the Minister, under section 77, to make regulations requiring relevant road authorities to take measures to mitigate the effects of road traffic noise. The Act also empowers the Minister to specify

limits for road traffic noise which would lead to a requirement for mitigating measures by roads authorities if exceeded.

At present there are no limit values or standards for controlling road traffic noise, or its assessment on either new or existing roads.

2.2.3 National Roads Authority Guidelines

In the absence of a regulatory assessment method or limit values the NRA undertook to issue the document '*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*' in 2004, which sets out the procedure to be followed in respect of '*the planning and design of national road schemes*'.

The Guidelines review common practice in Ireland at the time, as well as the relevant approach within the UK. They go on to recommend an approach to measuring existing levels of environmental noise in areas near to proposed new or altered national roads, indicate an approach to undertaking an noise impact assessment of the proposed road, present a design goal for the introduction of mitigation measures to reduce the potential noise impact from the proposed road.

The design goal is set at 60 dB L_{den} , an earlier version also included a proposal for a 50 dB L_{night} criteria, however this was dropped ahead of the final publication mainly due to the calculation of future night time noise levels being shown to be less robust than desirable when actual night-time traffic flow data was not available.

It is important to consider that the design goal is not a statutory limit value, rather a target for best practice design where mitigation is feasible.

2.2.4 Planning

Local Authorities have it within their powers to set conditions relating to noise as part of a planning permission, however there is currently no national policy or guidance which addresses the issue of noise during planning.

The Department of the Environment, Heritage and Local Government (DEHLG) has published the following documents relating to sustainable development in the urban environment:

- Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities), September 2007;
- Sustainable Residential Development in Urban Areas: Guidelines for Planning Authorities, December 2008; and
- Urban Design Manual: A best practice guide (A companion document to the Draft Planning Guidelines on Sustainable Residential Development in Urban Areas), February 2008.

The document dealing with Design Standards for New Apartments calls for *'attention at the design and construction stages to prevent undue noise transmission between units'*. Unfortunately there is no guidance setting appropriate design goals, or the assessment methodology to be employed, other than reference to Part E of the Building Regulations (see section 2.2.8).

The Guidelines for Sustainable Residential Development highlight the need to *'Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience'*. They go on to state that *'Privacy is an important element of residential amenity'*. Whilst they are not mentioned specifically, it is appropriate to consider environmental noise and noise transfer between dwellings in respect of amenity and privacy.

The Urban Design Manual lists Privacy & Amenity as one of twelve key issues, with specific reference to the need to prevent sound transmission in homes by way of appropriate acoustic insulation or layout. There is some comment in relation to the use of appropriate building materials and also the zoning of dwellings to minimize the potential for excessive noise transfer.

2.2.5 IPPC Licensing

In 2012, the EPA published a Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). The updated guidance was intended to assist licensed sites with the assessment of their potential and actual noise impact on the local environment. It also recommended an evening limit and gave further advice in relation to appropriate noise limits in areas of low background noise.

2.2.6 Wind Energy

The DEHLG published a document *Wind Energy Planning Guidelines* which suggests a *'lower fixed limit of 45 dB(A) or a maximum increase of 5 dB(A) above background noise at nearby noise sensitive locations'*. The latter requirement may be relaxed in areas with low background levels. A fixed limit of 43 dB(A) at night-time is deemed appropriate by DEHLG as there is no requirement to protect external amenity.

The EPA also published a Guidance Note on Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3). It proposed a cumulative site and turbine noise limit of 55 dB $L_{A_{r,T}}$ for daytime, 45 dB $L_{A_{eq}}$ for night-time and the wind turbine noise not to exceed 45 dB $L_{A_{eq}}$ at any time or to contain any significant tonal components.

2.2.7 Quarries and Ancillary Activities

The EPA document also contains a discussion of the primary sources of noise associated with quarrying and offers guidance in relation to the correct approach to be followed in respect of assessment and mitigation. Suggested noise limit values are 55dB $L_{A_{eq,1hr}}$ and 45dB $L_{A_{eq,15min}}$ for daytime and night-time respectively, although it suggests that more onerous values may be considered appropriate in areas with low levels of pre-existing background noise. In respect of blasting, reference is made to EPA guidance to the effect that *'blasting should not give rise to air overpressure values at the nearest occupied dwelling in excess of 125 dB(Lin) maximum peak with a 95% confidence limit'*.

2.2.8 Building Regulations 1997 - 2007

The current Irish Building Regulations call for certain constructions to offer ‘reasonable resistance’ to both airborne and impact sound. In the absence of any form of objective criterion, reference is often made to the guidance values put forward in the ‘Similar Construction’ method described in Technical Guidance Document E. The Regulations apply to the transmission of sound between adjoining residential dwellings, such as within apartment blocks, or semi-detached properties, they do not relate to the transmission of sound from the outside environment into the living accommodation.

2.3 Regional or Local Legislation or Guidance

Within County Kildare and the wider Greater Dublin Region there are a number of relevant policy objectives and guidance documents which are relevant within the context of noise action planning. These are briefly reviewed below.

Firstly, the Council has regard to the ‘*Regional Planning Guidelines for the Greater Dublin Region*’. It seeks to influence county wide the impact of noise through the Kildare County Development Plan 2011-2017 and over a more limited area geographically through Local Area Plans and Action Area Plans.

2.3.1 Regional Guidance

The *Regional Planning Guidelines 2004-2016* lays down guidelines for proposed developments within the Greater Dublin Area. Section 9, which deals with the Preservation and Protection of the Environment and its Amenities, including the Archaeological, Architectural and Natural Heritage, states:

‘In relation to protecting the environment, the guidelines recommend that planning authorities give careful consideration to the ambient noise climate prior to the approval of noise sensitive developments. In a consideration of current trends, it notes that continuing reliance on private transport will result in greater

exposure to noise. In relation to Strategic Environmental Assessments, it seeks to improve the health and well being of the population through the creation of a safe, healthy and high quality environment and has as a target reducing population exposure to high levels of noise and vibration’.

2.3.2 Development Plan

In the Kildare County Development Plan 2011-2017, the Council sets out strategies in relation to transportation, environment and development control, which directly and/or indirectly influence the impact of noise.

In relation to the physical infrastructure strategy, the Plan includes the following objectives for transportation:

- To provide distributor/relief roads linking the arterial routes in all major towns
- To prepare an integrated transportation strategy for Kildare
- To ensure that all developments are accessible to sustainable modes of transport
- To encourage and facilitate safe walking and cycling routes as a valuable form of transport, as a healthy recreational activity and an alternative to the car
- To support the electrification and upgrading, including the twin tracking of the Maynooth and four tracking of the Kildare rail lines

The Plan proceeds to set out policy statements that directly and/or indirectly seek to influence the impact of noise from traffic in areas such as public transportation, cycling and walking, national roads, distributor relief roads, the Roads Programme and local roads.

In relation to Environmental Services, the objectives of the Council include

- To facilitate the implementation of the Kildare Noise Action Plan 2009 and any subsequent amendments.....

And the Development Plan policies include the following:

- To enforce where applicable, the provisions of the Environmental Noise Regulations 2006.
- To ensure that noise levels caused by new and existing developments throughout the country do not exceed normally accepted standards and that new developments shall incorporate measures to ensure compliance with the Environmental Noise Regulations 2006 and any subsequent revision of these Regulations.
- To regulate and control activities likely to give rise to excessive noise
- To require activities likely to give rise to excessive noise, to install noise mitigation measures and monitors.

Chapter 19, which deals with Development Management Standards, also includes a number of references to noise and noise mitigation.

2.3.3 Corporate Plan

In the Corporate Plan 2009-2014, the Council seeks to influence the impact of noise directly and indirectly by the adoption of strategies in relation to areas such as road safety campaigns, provision of traffic calming, road improvement schemes and maintenance of the road network.

2.3.4 Local Area Plans

The Council also produces local area plans in respect of developments located in certain towns. Historically, these did not include any explicit

reference to noise but did include maps showing land use zones, the development of which may impact on adjacent noise sensitive developments. Recent local area plans compel all new developments to comply with the requirements of the Kildare Noise Action Plan.

2.3.5 Action Area Plans

Action Area Plans are also produced but these are non-statutory and again historically the impact of noise on noise sensitive developments was not generally considered.

3 Description of the Action Planning Area

3.1 Introduction

The Kildare Local Authorities cover an area of approximately 1,693 km² and is populated by 209,955 people (2011 census). Within its boundaries there are approximately 157 km of motorway and national roads, and 2,371 km of regional and local roads. Figure C1 in Appendix C presents a map of County Kildare showing the main road infrastructure. There is also 103 km of railway which is shown in Figure D1 of Appendix D.

3.2 Extent of the action planning area

Kildare Local Authorities and the NRA identified the extent of major roads using traffic count data to identify any sections of motorways, national roads or regional roads with more than 3 million vehicle passages per year. The traffic counts used were undertaken for a typical year as opposed to a year when temporary non-typical conditions might apply.

Iarnród Éireann and the Railway Procurement Agency identified one section of major railway within the county on the Kildare line.

In County Kildare there are no major agglomerations or major airports.

In Kildare the motorways and major national roads identified and included within the strategic noise mapping were as follows:

- M4 between the boundary with South Dublin County Council at Leixlip and the boundary with Meath County Council at Ballynakill and between the boundary with Meath County Council at Martinstown and the boundary with Meath County Council at Clonard - at Maynooth East the annual average daily total vehicles was estimated at 49,680 vehicles (2011);

- M7/N7 between the boundary with South Dublin County Council at Castlewarden and the boundary with Laois County Council at Jamestown - at Kildare South the annual average daily total vehicles was estimated at 34,149 vehicles (2011);
- M9 between its junction with the M7 at Hillsborough and the boundary with Carlow County Council at Burtonhall - at Mullinavat the annual average daily total vehicles was estimated at 8,859 vehicles (2011);
- N78 between Athy and M9 at Mullamast Cross Roads – at Fox Hill the annual average daily total vehicles was estimated at 3,633 vehicles (2010);

In addition, the following regional roads were classified as major either in total or in part – R149, R149, R158, R403, R406, R407, R410, R413, R416, R445, R447, R448 and the R449.

There were also six local roads classified as major either in total or in part – L2036, L2038, L2039, L3011, L4079 and L5078.

Mapping involved estimating noise levels at and adjacent to the major roads detailed above. In the context of the noise action plan this refers to all areas exposed to noise from the major roads above a level of L_{den} 55 dB(A) or L_{night} 50 dB(A). Appendix C includes maps which show the extent of the areas of strategic noise mapping arising from road traffic.

The total length of identified major roads included within the strategic noise mapping was 258 km which amounts to 10.2% of the total road network which is relatively large compared to other counties. This broke down into 157 km of motorways and national roads, 94.4 km of regional roads and 6.4 km of local road.

Iarnród Éireann identified one section of major rail on the Kildare Line which is 39 km in length:

- Between the boundary with South Dublin County Council at Balscott and the Cherryville junction west of Kildare Town.

Iarnród Éireann/ Railway Procurement Agency developed the Noise Mapping. Appendix D includes maps which show the extent of the areas of strategic noise mapping arising from rail traffic.

Within the areas covered by the strategic noise mapping of road and rail traffic, the noise action plan sets out a proposed approach to undertaking a review of the requirement for any necessary noise reduction measures, and outlines a method by which noise mitigation measures will be assessed for feasibility. This is in line with the requirements of the Directive and Regulations.

In addition to this statutory requirement, Kildare Local Authorities may set in place measures aimed at preventing and avoiding an increase in the harmful effects of environmental noise, including annoyance, which shall be applicable throughout the County Kildare administrative area. These measures go beyond the objectives of the Regulations and are proposed in the context of sustainable development and the protection of residential amenity for all regions of the County and considered to be in line with the strategic objectives of the County Development Plan in offering a sustained or enhanced environment for all citizens of Kildare.

3.3 Description of the topography/ geographical location

The area covered by the strategic noise mapping includes a mixture of urban and rural settlements in the centre and northern eastern part of the county.

In addition, areas of natural beauty and recreational areas are included within the study. These include the National Stud, the Curragh, walks along the Grand Canal (the Naas - Corbally Branch) and along the Royal Canal near Moyvalley.

3.4 Description of the general population

There are twelve main population centres within the area covered by the strategic noise mapping and potentially exposed to noise from major roads. They are the towns of Leixip, Maynooth, Kilcock, Kill, Johnstown, Naas, Newbridge, Kildare, Celbridge, Clane, Prosperous and Kilcullen.

There is generally minimal exposure to environmental noise from motorways at adjacent residential property where the design of the motorway preceded adjacent development. However, there are a few significant cases where estates have been developed after the planning/construction of the motorway which give rise to complaints from residents.

Similarly, ribbon development along the N7 and N78 national roads may have given rise to complaints in the past but the N7 road widening scheme and the construction of the M9 included noise mitigation measures in the design process.

The major rail line affects the towns of Sallins, Newbridge and Kildare.

3.5 Location of noise sensitive groups

Certain locations and building uses are considered to be more sensitive to environmental noise pollution than others. The main priority of the Directive is to manage environmental noise exposure in residential areas. The Directive, Regulations and EPA guidance all indicate that the Action Planning Authority should take due consideration of the noise sensitive locations, if any, in addition to residential dwellings.

Following consideration it has been determined that for the purpose of the assessment of potential noise mitigation measures under the Action Plan the following are considered noise sensitive locations:

- Residential properties;
- Hospitals; and
- Schools.

Arising from road traffic, the following hospitals and schools are identified as noise sensitive:

Leixlip	San Carlo Junior National School
	San Carlo Senior National School
Maynooth	St. Mary's Boys School,
	Gaelscoil Uí Fhiaich
Clane	Clane Hospital
	St. Patrick's Boys School
	Scoil Naisiunta Bhríde
Prosperous	Scoil an Linbh Iosa
Kilcullen	Cross and Passion College
	St. Brigids National School
Newbridge	Holy Family National School
	St. Conleth's Infants National School
	Holy Family Secondary School

There are no hospitals and schools identified as noise sensitive arising from rail traffic.

It is important to note that only properties with these uses which are located within the area of strategic noise mapping near to the major roads and rail lines will be considered in the review of potential noise mitigation measures. Within the county area there will be many more such properties which are not

in close proximity to the major roads and rail lines under review, and will thus not be included within the noise mitigation assessment under the action plan.

The locations considered to be noise sensitive in close proximity to the major roads may, subject to funding, be provided with some protection from further erosion of the noise climate through the measures set out within the action plan to prevent and avoid high levels of environmental noise exposure in the future.

4 The Responsible Authority for Action Planning

4.1 Name and contact details for the Responsible Authority

Kildare Local Authorities are the designated Action Planning Authorities under the Regulations and responsible for the production and implementation of the action plan for County Kildare.

The address of each authority is given below:

Athy Town Council	Kildare County Council	Naas Town Council
Rathstewart	Aras Chill Dara	Aras Chill Dara
Athy	Devoy Park	Devoy Park
Co. Kildare	Naas	Naas
	Co. Kildare	Co. Kildare

Any communication in relation to the Noise Action Plan should be addressed to:

Senior Executive Officer,
Transportation Department,
Kildare County Council
Telephone: 045 980200
Fax: 045 980240
Email: noise@kildarecoco.ie

4.2 Description of any noise-reduction measures already in force within the action planning area, or projects in preparation

4.2.1 Noise limit values

There are no specific noise limit values currently in place within the County except for those previously discussed in section 2 above.

4.2.2 Existing local policies

In the case of planning applications by third parties for industrial or commercial developments close to residential areas, the Council would normally apply the following maximum limits:

Daytime	55 dB(A) Leq
Night-time	45 dB(A) Leq (or exceptionally 40 dB(A) Leq)

In the case of other planning applications, a general requirement may be added such as '*Noise is to be kept to a minimum, in so far as is practical*' during the construction phase of the development.

Where an environmental impact assessment is required as part of the planning process, noise would normally be one of the impacts considered but any noise limits or planning conditions is decided on a case by case basis.

In relation to outdoor events licensed under the Planning and Development Act 2000, the Council would normally apply a maximum permissible limit of 65 dB L_{Aeq} at noise sensitive locations.

In the case of national roads proposed by the Council, the assessment of noise impact is undertaken in accordance with the NRA Guidelines from 2004 as specified in section 2.2.3. All new national roads are designed, where feasible, to meet the following criteria

Free field residential façade criteria	60dB L _{den}
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which is applied both to the year of opening and the design year of the scheme, i.e. 15 years after opening. Kildare Local Authorities apply the same criteria to the design of new regional roads.

In addition, contract documents generally specify the following maximum noise limits during the construction phase of infrastructure projects:

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Day	Working Hours	Level (dB L_{Aeq})	Maximum (dB L_{Amax})
Monday-Friday	07:00 – 19:00	70	80
Monday-Friday	19:00 – 22:00	60	65
Saturday	08:00 – 16:30	65	75
Sundays & Bank Holidays	08:00 – 16:30	60	65

In relation to the position of structures relative to roads, the Development Plan prohibits new developments within a specified distance depending on road type. The road classifications and associated distances are as follows:

Road Classification	Distance
Motorways/national roads	91.0m
Regional Roads	31.0m
Urban/County Road/Distributor	18.5m

To date, the Council has not specified any minimum level of noise insulation for proposed developments.

As part of their work, the road maintenance section resurfaces roads and fills in potholes. Where resurfacing is undertaken in urban areas and where existing carriageways are narrow, an appropriate thin layer surfacing which produces less noise when trafficked than alternatives is used. Where carriageways are relatively wide and where an Authority receives noise complaints arising from traffic, its use would also be considered in resurfacing. The website fixmystreet.ie is a new interface by which the public can bring

potholes to the attention of the Local Authorities. All repairs to potholes lead to a reduction in traffic noise.

With regard to the assessment of noise nuisance in the context of the EPA Act, Kildare Local Authorities did not develop a documented policy statement during the time span of the current Noise Action Plan, but may consider developing one in the future.

4.2.3 Current noise mitigation plans

The Authorities have multi-annual programmes for the construction of national, regional and local roads, promotion of public transport and sustainable transport and traffic management in towns within the County as detailed below.

4.2.3.1 Construction of Roads within the County

Progress on the schemes listed below is dependent on the availability of funding or alternatively private developers taking the lead role in the provision of same.

- Naas
 - Dublin Road / Tipper Road/ Blessington Road
 - Devoy Link Road
 - Kilcullen Road Improvement Scheme
 - R411 - Ballymore Road Improvement Scheme
 - M7 Naas Newbridge By Pass Upgrade
- Clane
 - Capdoo Inner Relief Road
- Newbridge
 - Outer Relief Road
 - Link Road
- Maynooth
 - Straffan Road / Celbridge Road

- Celbridge Road / Dublin Road
- Athy
 - Southern Distributor Road
 - Northern Distributor Road
- Kildare Town
 - South Green Road Infrastructure
 - Dunmurray Road
- Rathangan Relief Road
- M7 Interchange and Sallins Bypass

As each of these schemes advances through the design process the relevant environmental impact assessments will be undertaken, including noise, and the noise management guidelines within the noise action plan will be followed to help minimise potential noise impact.

4.2.3.2 Sustainable Modes/ Promotion of Public Transport

In accordance with the principles of sustainability and the National Spatial Strategy, Kildare Local Authorities promote modal shift by policies and actions encouraging the greater use of sustainable modes and public transport. Actions include the designs for the provision of cycle facilities at Straffan Road Maynooth and the Sallins Road & Dublin Road Naas, implementation of mobility impaired schemes and the footpath construction. The '*It's Your Time*' initiative also supports this strategy by facilitating the location of business in proximity to a skilled workforce, thereby reducing the need for commuting.

4.2.3.3 Traffic Management Plans

Traffic Management Plans have been developed for the towns of Maynooth, Celbridge, Kilcock, Clane, Naas, Athy, Monasterevin, Kildare and Newbridge. They are designed to make best use of existing road space especially in existing town centres. In addition to promoting modal shift and encouraging sustainable modes, the Traffic Management Plans seek to improve the environment in general and the noise environment in particular by calming

traffic and, where applicable, by diverting traffic away from town centres. The Traffic Management Plans are also designed to improve junction efficiency thereby reducing delays to motorised traffic.

5 Summary of the Results of Noise Mapping

5.1 Overview of the preparation of the noise map

The strategic noise mapping process is a predominantly technical process requiring an array of different input datasets across large geographical areas. For example, assessment of noise levels from major roads requires information on traffic flow level, percentage of traffic flow which is heavy goods vehicles, mean traffic speed, road gradient, road surface type and texture depth, location of noise barriers and bridges, location and height of buildings, landscape topography and type of ground cover. The assessment of noise levels from major railways employs an equivalent range of data. These datasets are combined to form 3D computer models, through which an assessment of noise propagation is undertaken using specialist computer software systems.

The noise level is assessed on a regular grid pattern across the model, and these results are used with a model of estimated population distribution to assess the numbers of people exposed. The nature and extent of the various datasets required, inevitably means that the results provide a best estimate, rather than a complete and wholly accurate account.

Within the context of the Directive and its requirement for the strategic noise maps to *'provide a representation of the noise levels perceived within that area'* (Paragraph 10), and the development of strategic policy, it is important to understand the scale of the uncertainties inherent within the results at this stage, rather than strive for an unachievable goal of total accuracy. Knowledge of the strategic noise mapping process and uncertainties are beneficial during the development and execution of noise action plans.

The results of the strategic noise mapping process help to gain an understanding of:

- Where environmental noise is located;
- The approximate magnitude of noise levels within the assessment area; and
- Approximately how many people are exposed to differing levels of environmental noise.

For major national roads in Kildare the strategic noise mapping and modelling was undertaken by the NRA. For non-national roads, Kildare Local Authorities prepared the data sets and the mapping and modelling was undertaken by RPS Consulting Engineers in conjunction with the NRA.

The strategic noise mapping resulted in grids of calculated noise levels at 10m intervals within the Dublin and Cork agglomerations, and near to major roads, major railways and the major airport. The strategic noise maps were assessed using the calculation methods set out within the Regulations using computer software. At this stage the measurement of noise levels using sound level meters has not played an extensive role in the development of the strategic noise maps, although some measurements have been undertaken within the Dublin City Council area to help assess the validity of the computer calculations.

5.2 Presentation of results

Grids of noise levels for major roads and for major railways were produced for an annual average 24 hour day, using two different noise indicators, L_{den} and L_{night} . These grids of noise level results were then categorised into 5 dB wide noise level bands above 50 dB L_{den} and 45 dB L_{night} . These noise level bands may then be displayed as coloured areas on noise level maps, and used as the basis for statistical analysis to estimate the extent of exposed areas, and the number of exposed dwellings and number of exposed people. These statistical exposure results were submitted to the EC in December 2012 by the EPA.

5.2.1 Strategic noise maps

The results of the strategic noise mapping within County Kildare are presented in Appendices C and D as a series of coloured 5 dB(A) wide noise level bands above 55 dB L_{den} and 50 dB L_{night} .

5.2.2 Road Noise - Summary exposure statistics

Table 5.1 summarises the estimated total number of people exposed in each 5 dB(A) L_{den} noise level band within County Kildare over an average 24 hour period.

L_{den} Noise Band	Approx Number of People	Approx Number of People as % of Total Population in Kildare
<55	108,561	76.3%
55-59	18,687	13.2%
60-64	9,075	6.4%
65-69	4,775	3.4%
70-74	963	0.7%
≥ 75	6	0.0%
Total	142,067	100%

Table 5.1: Weighted 24 Hour Road Traffic Flow (L_{den}) - Estimated Number Of People in dB Bands and as Percentage of Overall Population

L_{den} Noise Band	Approx Area Km^2	Approx No. of Dwellings	Approx No. of People
>55	133	13,080	33,506
>65	34	2,510	5,744
>75	7	2	6

Table 5.2: Weighted 24 Hour Road Traffic Flow (L_{den}) – Estimate of Area, No. of Dwellings and People in dB Bands

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Table 5.2 above summarises the approximate number of people, dwellings and area above listed thresholds within County Kildare over an average day.

Table 5.3 below summarises the estimated total number of people exposed in each 5 dB(A) L_{night} noise level band within County Kildare over an average 24 hour period.

L_{night} Noise Band	Approx No. of People	Approx Number of People as % of Total Population in Kildare
<50	124,355	87.5%
50-54	10,232	7.2%
55-59	6,343	4.5%
60-64	1,114	0.8%
65-69	23	0.0%
>70	0	0.0%

Table 5.3: Weighted 24 Hour Road Traffic Flow (L_{night}) - Estimated Number Of People in dB Bands and as Percentage of Overall Population

L_{night} Noise Band	Approximate Area Km^2	Approx No. of Dwellings	Approx No. of People
>50	83	7,089	17,712
>60	18	585	1,137
>70	2	0	0

Table 5.4: Weighted 24 Hour Road Traffic Flow (L_{night}) – Estimate of Area, Number of Dwellings and People in dB Bands

Table 5.4 above summarises the approximate number of people, dwellings and area above listed thresholds within County Kildare over an average day arising from road traffic.

5.2.3 Rail Noise - Summary exposure statistics

Table 5.5 summarises the estimated total number of people exposed in each 5 dB(A) L_{den} noise level band within County Kildare over an average 24 hour period.

L_{den} Noise Band	Approx Number of People	Approx Number of People as % of Total Population in Kildare
<45	203,800	97.0%
45-49	2,300	1.1%
50-54	1,900	0.9%
55-59	900	0.4%
60-64	600	0.3%
65-69	600	0.3%
70-74	0	0%
≥ 75	0	0%
Total	210,100	100%

Table 5.5: Weighted 24 Hour Rail Traffic Flow (L_{den}) - Estimated Number Of People in dB Bands and as Percentage of Overall Population

Table 5.6 below summarises the approximate number of people, dwellings and area above listed thresholds within County Kildare over an average day.

L_{den} Noise Band	Approx Area Km^2	Approx No. of Dwellings	Approx No. of People
>55	5.91	800	2200

>65	1.5	300	700
>70	0.51	0	0
>75	0.01	0	0

Table 5.6: Weighted 24 Hour Rail Traffic Flow (L_{den}) – Estimate of Area, No. of Dwellings and People in dB Bands

Table 5.7 below summarises the estimated total number of people exposed in each 5 dB(A) L_{night} noise level band within County Kildare over an average 24 hour period.

L_{night} Noise Band	Approx Number of People	Approx Number of People as % of Total Population in Kildare
<45	25,700	12.2%
45-49	1,000	0.5%
50-54	600	0.3%
55-59	700	0.3%
60-64	0	0%
65-69	0	0%
70-74	0	0%
≥ 75	0	0%

Table 5.7: Weighted 24 Hour Rail Traffic Flow (L_{night}) - Estimated Number Of People in dB Bands and as Percentage of Overall Population

The results clearly show that noise from road traffic, as opposed to rail, is the dominant source of noise affecting people.

6 Identification of Areas to be subject to Noise Management Activities

The results of the strategic noise maps help to provide an indication of the extent of environmental noise exposure within the area of the assessment. As for the previous round of action planning, the proposed approach is to identify locations where noise mitigation measures are necessary, feasible and cost effective.

The priority decision support matrix which was previously developed and which takes into account factors such as the noise exposure level, type of noise receptor, the type of noise source and the number of people affected will be used. It enables a number of different factors to be examined and facilitates the assessment of the relative importance of each. The decision support matrix is shown in Appendix F.

In order to understand the development of the decision support matrix, some of the underlying principles which have shaped the development of the decision support matrix are reviewed.

6.1 Estimation of Population above Assessment Thresholds

The beginning of this process required some form of noise level value, or values, for the onset of the process of assessment of need. The noise levels used do not constitute any form of design guideline for noise management, nor do they necessarily indicate that at or above such levels the environmental noise should be considered undesirable. They are set out as a starting point in a process which seeks to identify locations exposed to existing levels of environmental noise for which it may be considered appropriate to address the exposure through mitigation measures.

The existing guidance and policies reviewed in Section 2, along with an understanding of current best practice, were used to inform the selection of threshold levels. In Kildare, the proposed onset levels, for assessment of noise mitigation measures due to exposure to road and rail traffic noise, are:

- 70 dB, L_{den}
- 57 dB, L_{night}

Using these thresholds for L_{den} and the figures given in Tables 5.1 – 5.7, it is estimated that there is a population of 969 people in 423 residences who experience road traffic noise levels in excess of the assessment thresholds. There are no people experiencing similar levels of L_{den} noise from rail traffic.

Using the above thresholds for L_{night} and the figures given in Tables 5.1 – 5.7, it is estimated that there is a population of 3674 people in 1890 residences who experience road traffic noise levels in excess of the assessment thresholds. In relation to rail traffic noise, it is estimated that there is a population of 420 people in 164 residences who experience noise levels in excess of the assessment thresholds.

In comparison, the results of the first round of noise mapping found that arising from road traffic an estimated population of 46 experienced noise levels in excess of the assessment thresholds for L_{den} and a population of 1450 experienced noise levels in excess of the assessment thresholds for L_{night} . Although this indicates a significant increase in the numbers affected since 2008, it is considered that the increase is not due to deterioration in the noise environment per se but due to an increase in the extent of major roads from 89km to 258km.

The levels chosen are not necessarily in line with the reviewed guidance as they are to be used for the retrospective assessment of noise from existing roads. This is a different situation than, for example, the NRA Guidelines,

which are concerned with an assessment of a proposed road development within the context of planning for future situations. Until the introduction of the Regulations, there had not previously been any requirement to assess existing noise sources with a view to mitigation.

6.2 Protection Thresholds for Quiet Areas

Under the Regulations it is required to delimit quiet areas within agglomerations. As there is no qualifying agglomeration within County Kildare, there is no statutory requirement to identify quiet areas within Kildare.

Within the coverage of the strategic noise mapping there may be public open space or recreational areas where it is deemed desirable to have relatively quiet noise levels. As the identification and delimiting of quiet areas is a means of ensuring that noise levels are preserved where they are good, it is considered appropriate to consider using the concept of quiet areas within the action plan.

To this end, initially it is considered appropriate to propose onset noise levels for the assessment of noise level preservation where they are good, at:

- 55 dB, L_{den}
- 45 dB, L_{night}

During the implementation of the action plan it is proposed to identify locations in the vicinity of the major roads which have noise levels below these criteria and review their use. If appropriate or necessary locations could be identified as quiet areas where the existing noise levels are to be preserved or reduced if possible.

The types of public open spaces which could be considered appropriate to include within the assessment include areas such as:

- Recreation areas;
- Playing fields;
- Playgrounds;
- Public parks and gardens;
- Nature reserves;
- Cemeteries;
- River banks; and
- Canals.

And possibly extend to locations such as:

- Places of worship;
- Hospitals, including nursing and convalescence homes;
- Educational institutions;
- Childcare/crèche facilities;
- Offices; and
- Some livestock farms.

It is also relevant to consider that some public open spaces may currently have low levels of environmental noise as indicated by the strategic noise mapping, yet have much higher existing noise levels due to other noise sources not considered within the scope of the mapping, such as recreation, entertainment, neighbourhood noise, smaller roads, railways or industry. Similarly there may be other areas which it may be desirable to identify and designate, due to usage and utility, despite having a reasonably high level of environmental noise as indicated by the strategic noise mapping.

In the future, it is proposed in conjunction with the Environment Department to consider the designation of Lakelands Naas and Carton Walk Maynooth as quiet areas in the vicinity of a major road. A report on the noise environment will be prepared to ascertain the existing noise environment.

6.3 Quiet Areas in Open Country

The Environmental Noise Regulations define an area in open country as '*an area, delimited by an action planning authority following consultation with the Agency and approval by the Minister, that is undisturbed by noise from traffic, industry or recreational activities*'.

By definition the areas covered by the strategic noise mapping will not include any areas which may be considered undisturbed by noise, and it would be more appropriate to consider recent research work undertaken on tranquillity which addresses the interaction between noise and other factors such as visual amenity, cultural, historic, ecological, landscape and presence of natural sounds.

In support of this aspect of the regulations the EPA commissioned research work undertaken by Waugh and Durcan to evaluate baseline noise levels in areas of rural Ireland.

The complex interrelationships between the various factors which build up an impression of tranquillity means that the classification of quiet areas in open countryside may not be defined on acoustic measurement alone but should incorporate criteria which balance the various associated aspects.

During the implementation of the action plan a review may be undertaken of the research in this area, and the findings referenced across to the County Kildare policies set out in the Development Plan on landscape character areas, protected views and scenic routes and heritage conservation. These

would have to be balanced against the projected demands for rural development, tourism and the extractive industries. As appropriate, the authorities may then identify quiet areas in open countryside and undertake public consultation prior to any recommendation for approval by the Minister.

6.4 Application of the Criteria

With the definition of thresholds for onset of assessment for noise mitigation and onset of assessment for noise preservation, the priority decision support matrix will provide a rating scheme which will initially help to identify locations beyond the assessment thresholds, but also assist in the process of ranking the locations to help develop an initial prioritisation for further investigation.

The priority decision support matrix will then be used to draw up a short list of potential areas for action, both above the onset values, and below the level for preservation to help identify Quiet Areas. The shortlists will then be mapped within a GIS system to look for any clusters which could be considered “hot spots”. As necessary a second shortlist will be drawn up to take into account the presence of any “hot spots”.

The decision support matrix is designed such that a score of approximately 17 or above indicates that the location in question should be included in a shortlist for further assessment.

The decision support matrix will also be used to assess all noise sensitive locations within the strategic noise mapping area during the implementation of the action plan.

6.5 Results of the analysis

The implementation plan proposes to undertake the analysis during the second year of the action plan, i.e. 2015, and present the results in the annual review report.

7 Mitigation and Protection Measures

7.1 General Principle of Action Plan

Kildare Local Authorities have drawn up a number of general principles which it considers the Noise Action Plan aims to support.

Kildare Local Authorities' Noise Action Plan aims to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, due to long term exposure to environmental noise;

Kildare Local Authorities will adopt a strategic approach to managing environmental noise by following a balanced approach which promotes:

- Noise reduction at source
- Land use planning adapted to noise targets
- Procedures to reduce noise impact, and
- Operating restrictions to reduce noise emission.

Kildare Local Authorities' Noise Action Plan will have regard to the principles of sustainable development and integrate with other strategic policy objectives of Kildare Local Authorities;

Kildare Local Authorities will seek to be a facilitator of change and will strive to be a model of best practice that in turn can influence other bodies.

7.2 Processing Areas above Onset of Assessment Criteria

Following the prioritisation exercise based upon the results of the strategic noise mapping, an ordered shortlist of areas will be drawn up which will

proceed to the next stage in the process. The aim of this stage is to confirm that the noise levels assessed by the strategic noise mapping are experienced by the properties and population within the areas being addressed.

It must be pointed out that up to this stage the Noise Action Plan will be implemented using in-house resources. However, the next step - confirming noise levels on site - will involve outsourcing work. While some monitoring has been carried out under the first Noise Action Plan it has not led to any mitigation in the noise environment for various reasons. Furthermore, there is little point in confirming noise levels at multiple sites if there is then no funding to carry out remedial works. Therefore before committing to carrying out any confirmation of noise levels on site, an assessment will be made about the likelihood of success in procuring funding for mitigation works and unless there is a reasonable likelihood of funding, confirmation of noise levels will not proceed.

The confirmation of noise levels indicated by the strategic noise maps may be undertaken in two ways. The first is to undertake field survey work to measure noise levels prior to the commencement of any works. The second approach would be to undertake a review of the strategic noise models and then refining if appropriate. In a best practice situation the aim would be to undertake both approaches, with measurements repeated after any actions are carried out in order to confirm the delivered results.

The review and possible refinement of the strategic noise model may help to reduce the uncertainty in the calculated noise levels within the area under review, and will benefit any subsequent use of the model to assess the potential level of noise reduction benefit which may be delivered to the residents by potential mitigation measures. Field survey work would help with calibration of the strategic noise map, as well as provide information on whether the properties being assessed had noise sensitive rooms located on

the most exposed facades, or whether noise mitigation measures were already present which may not be indicated within the calculation model.

Once the extent of the existing noise impact has been confirmed for the locations under review, the potential noise mitigation measures would then be investigated, and a cost benefit analysis undertaken for each, with the aim of developing a selection matrix which leads towards a recommendation for action.

This staged approach helps to ensure that any work undertaken will be cost effective, will deliver genuine benefit to the residents, and will be undertaken in a prioritised manner which is objectively based.

7.3 Preservation of Areas below Protection Threshold

Where areas are identified as being below the onset of preservation threshold, they will be considered for review in the context of the review for quiet areas. In addition to this, if the locations identified have cultural or amenity value then the planning process will be used to help preserve the nature and level of the existing sound environment. More details on the proposed use of planning are set out below (Section 7.7).

7.4 Management of Areas between the Thresholds

For sustainable development to be delivered over the long term, careful consideration of environmental noise pollution when planning for new developments will be a key factor in the management of the noise environment. Setting out clear planning policy relating to noise, and incorporating environmental noise strategies into the development, planning and zoning processes will help to ensure that the existing noise climate is preserved where appropriate.

With the twin focus on mitigation of noise for the most exposed residents, and preservation through designated quiet areas of the least exposed areas, there is a risk that the majority of households, which sit between these two categories, are not provided for within the action planning process. It is acknowledge that the action plan needs to provide a means of preventing and avoiding detrimental levels of long term noise exposure, and the development of planning guidance plays a key role in support of this target. Details on the proposed use of planning are set out in Section 7.7.

7.5 Overview of possible mitigation measures

Where the decision support matrix analysis identifies locations for which noise mitigation measures may be considered appropriate a review of available measures will then be undertaken.

As discussed previously it is the view of Kildare Local Authorities that a balanced approach needs to be taken to help sustainably manage the interests of the residents, the aims of the noise action plan and the development plan.

There are a wide range of potential noise mitigation measures, some of which may act at a national or regional level, others which may be purely localised. Likewise there are a number of levels of authority which may be capable of making actions. Some examples of measures which may be considered include:

- At EU level, vehicle noise emissions and tyre noise regulations would be set.
- At national level, national planning guidance or noise regulations would be set.
- At regional level transport policy objectives may be set such as;

- Improved public transport;
- Getting people out of cars; and
- Increasing bus, train, bicycle journeys.
- At local authority level there are powers to
 - Replace council owned diesel vehicles with compressed natural gas / electric;
 - Designate truck routes;
 - Restrict night time delivery or limits;
 - Grant planning permissions;
 - Reduce speed limits including establish 30kph zones;
 - Introduce road closures / traffic routing;
 - Resurface roads
 - Smooth broken surfaces;
 - Use low noise road surfaces on higher speed routes;
 - Define planning zones:
 - Locate noise sources and population with consideration to potential for noise impact;
 - Require façade insulation:
 - Require secondary or triple glazing as a mitigation measure;
 - Specify building construction details for new developments exposed to environmental noise;
 - Specify noise barriers;

- Liaise with the public groups; and
 - Set long term targets
- Roads authorities could undertake the following:
 - Traffic management – routes and HGVs;
 - New road construction (bypass);
 - Re-surfacing of roads;
 - Vehicle speed management;
 - Noise screening measures; and

From the above list it is apparent that the Authorities only have powers to act within a number of the possible mitigation scenarios. For others Kildare Local Authorities will seek to engage with the relevant authority and encourage actions to be undertaken to benefit the citizens of Kildare.

Research has been undertaken within EC funded projects looking into the design of noise mitigation measures, and estimates of the extent of costs and benefits. The conclusion is often that there is no single solution which provides the optimal solution, rather a range of measures, each of which may provide an incremental improvement in the situation.

These actions against noise will be considered during the assessment of possible noise mitigation for sites identified through the decision support matrix, but through the noise action plan they should be encouraged to be considered within local and regional development plans, road maintenance proposals and the planning process.

7.6 Assessment of Options

For the locations under review a list of potential noise mitigation actions will be drawn up. In order to undertake an assessment of feasibility and develop a prioritised list of actions, a cost-benefit analysis will be undertaken in order to maximise value for money and deliver benefit from investment.

The cost-benefit analysis will address lifetime construction and maintenance cost against noise reduction benefit. The extent of noise reduction may be a reasonably simple assessment if global source related measures are being considered, or may be more detailed and complex if specific local measures are being reviewed. Assessment of noise benefit may involve the use of the strategic noise models to undertake scenario testing to determine estimates of the noise reduction from identified design options. However there are a number of potential noise reduction measures which can be difficult to assess within the current calculation models, such as enhanced barrier design and many quiet pavement surfaces for example.

The benefit of noise reduction may be viewed in terms of decibels / people / time, and may be considered using an assessment of changes in estimated levels of annoyance or sleep disturbance, or could be monetised to fully process the analysis. Monetisation of noise is becoming increasingly common. The monetary assessments of noise levels tends to take two differing approaches, (i) impact upon property market value and (ii) willingness to pay by residents exposed to noise to produce a reduction. As may be expected these tend to lead to somewhat differing suggested levels of financial benefit. The appropriate metrics and valuations will be reviewed at the time of the analysis, using the best available research data.

The best information available at present comes from an EC working group position paper from 2003 *“Working Group on Health and Socio-Economic Valuation of Noise”* which proposes a median value in noise perceived by households of €25 per dB L_{den} , per household, per year based upon the noise

level change compared to the initial situation. As an example, a noise barrier benefiting 25 houses, by 5 dB L_{den} , with a 20 year design would provide an estimated benefit of €25 x 25 houses x 5 dB x 20 years = €62,500. The cost of a new noise barrier could be €200 per m², so a 100 m long, 3 m high noise barrier may cost €60,000.

7.7 Planning for Noise Management

The planning system has the potential to exercise a significant influence on the control of future exposure to environmental noise, and may play a key role in the improvement of amenity. The appropriate use of the planning system can help avoid, or minimise, the adverse impacts of noise without placing unreasonable restrictions on development.

There are two main scenarios in development where noise could be viewed as a material consideration:

A. Bringing People to Noise

- New housing, hospital, school, nursing home etc. developments near to existing road, rail, industrial or airport noise;
- Noise levels outside the façade, in gardens, in public open spaces;
- Noise levels inside the building.

B. Bringing Noise to People

- New or altered roads, railways, industrial sites or airports or commercial developments which would alter the noise environment in the vicinity of noise sensitive locations.

Experience in other EU countries suggests that the guidance and/or limit values for the two types of scenarios are not necessarily the same, and that extent of change may be as relevant to the consideration of impact as the actual level of noise.

In order to successfully use the planning process to help avoid, or minimise, noise exposure in a consistent manner it is considered appropriate for guidance on noise exposure levels to be considered within the proposal and design stage of planning applications.

In the scenario where new residential properties, or other noise sensitive premises, are introduced into an existing climate of environmental noise, there is currently no clear guidance. Until specific planning guidance on noise is forthcoming from DEHLG, Kildare Local Authorities may develop and publish its own set of guidance on noise assessment and control which would be applicable throughout the County. In the interim, Kildare Local Authorities will require quantifiable noise assessments to be carried where any part of the residential developments is located within 150m of a rail corridor. The quantifiable assessment of environmental noise shall include the situation internally with open windows and externally in amenity areas of the development.

In the scenario where new, or altered, sources of noise are introduced to existing residential properties, or other noise sensitive locations, there are currently a number of guidance documents which cover some of the situations which may arise, as discussed above. Where existing guidance does not cover the situation under consideration, Kildare Local Authorities will determine the format of assessment that it would consider appropriate.

It is currently envisaged that the guidance is likely to formalise the approaches to noise impact assessment which already appear commonly within Ireland. These are frequently based upon assessment methods within the UK, such as

National Planning Policy Framework (NPPF) in England and Wales; Planning Advice Note (PAN 1/2011) and Technical Advice Note (TAN): Assessment of Noise in Scotland; or BS 4142 for the assessment of industrial noise.

Whilst the control of external levels of environmental noise constitutes one aspect of noise management within planning, and aims to provide benefit to amenity spaces, the control of noise levels within residential properties, and other noise sensitive premises, also plays an important role.

In the scenario where new noise sensitive premises are introduced to locations already exposed to significant levels of long term environmental noise as set out in the Environmental Noise Regulations, i.e. 70 dB L_{den} and 57 dB L_{night} , it is considered appropriate to consider aiming to achieve target internal noise levels within noise sensitive rooms, such as living rooms and bedrooms.

In the case of new development, or conversions, these targets could be introduced through the use of appropriate planning conditions, and possibly some form of pre-completion testing as used in a number of other EU countries. The choice of targets for internal noise levels could be informed by the WHO Guidelines for Community Noise (2000) and Night Noise Guidelines for Europe (2009) or BS 8233.

8 Implementation of First Noise Action Plan

8.1 Report on Outcome of Actions

The first Noise Action Plan in 2008 set out a number of actions to be implemented over the time span of the plan. The following tables report on their outcomes:

Year 1 (2009)

Action Description	Outcome
Review strategic noise maps to identify priorities	Confirmed number and Identified location of properties adversely affected by environmental noise.
Decision support matrix	Completed – decision support matrix confirmed.
Confirmation of extent of impact	The number of residences in various noise bands were identified.
Draw up list of areas for noise mitigation review	Completed – Some residences were grouped into geographical areas.
Estimate extent of sources under 2012 strategic noise mapping	Completed - Details were passed to the EPA for collation.
Review County Planning development and planning guidance regarding noise control	Noise Action Plan incorporated into local area plans and review of County Development Plan.

Year 2 (2010)

Action Description	Outcome
Noise mitigation review	Not done – as no budget was provided for the mitigation of environmental noise, this action was premature.
Assess all identified sites	Not done – as no budget was provided for the mitigation of environmental noise, this action was premature.
Feasibility study for possible mitigation measures	Not done – as no budget was provided for the mitigation of environmental noise, this action was premature.
Cost benefit analysis for feasible measures	Not done – as no budget was provided for the mitigation of environmental noise, this action was premature.
Draw up list of cost effective interventions	Not done – as no budget was provided for the mitigation of environmental noise, this action was premature.
Set out data requirements for 2012 strategic noise mapping	Completed
Publish County planning guidance on noise assessment and control	Not done

Year 3 - 5 (2011 – 2013)

Action Description	Outcome
Commence implementation of the relevant actions – Action 1 (2011)	Monitoring noise levels at property on M4 (Maynooth). Endeavoured to put funding in place to bring forward solutions.
Commence implementation of the relevant actions – Action 2 (2011)	Further monitoring at two estates in Newbridge adjacent to M7, residential property adjacent to M7 outside Kildare and resident property in Kilcock adjacent to M4. Endeavoured to put funding in place to bring forward solutions.
Collate, capture and consolidate data required for 2012 strategic noise mapping	Completed – major roads identified traffic data collated
Assess implementation and use of guidance on planning and noise	Not Done

Year 4 (2012)

Action Description	Outcome
Produce new strategic noise maps for 2011 assessment year	Completed - Noise mapping was produced and forwarded to the EU by the end of the year.
Additional Action 1	Quantum of major roads extended to include urban areas which had been omitted and of some rural roads declassified as major roads due to

	reduction in traffic levels.
Additional Action 2	Kildare County Council became lead partner in engagement of consultant to carry out the noise mapping of non-national roads,

Year 5 (2013)

Action Description	Outcome
Review impact of Action Plan and amend where appropriate	Completed - Undertaken as part of revision of Second Noise Action Plan
Public consultation and finalisation of 2013 to 2018 Action Plan	Ongoing
Ongoing requirements	Oversaw completion of contract to carry out the noise mapping of non-national roads and reporting to the EPA.
Annual review of progress against milestone	For completion by end of year

8.2 Report on Reduction in Number of People affected by Environmental Noise

It is estimated that there has been no reduction in the number of people affected by environmental noise. There are a number of other reasons for this which include:

- Although the reduction in economic activity over the last few years has resulted in a decrease in traffic levels, this has been more than offset by the threshold level for a major road being reduced by 50%.
- The change in the modal split from private cars to more sustainable modes, if any, has been insignificant.
- Despite investment in public transport, the number of people using public transport is falling.
- No significant traffic management measures have been introduced. The function of the most critical roads, the M4 and M7, are for movement at a strategic level. It is therefore not feasible to introduce traffic management measures to reduce traffic levels.
- There have been some changes in speed limits but as previous, it is not feasible to reduce the speed limit on the M4 and M7.
- During the life span of the previous plan, no bypass or relief road was constructed to reduce the noise levels in areas significantly affected by traffic noise. Just prior to preparing the first Noise Action Plan, a number of bypass/relief roads were constructed throughout the County. Since then, with the economic situation, no similar roads have been completed.
- The Council has continued to resurface roads albeit with reduced budgets so potholes are not repaired as quickly as previously.
- The relevant sections of the M4 and the M7 motorways have not reached the stage where they are a priority for replacement of their pavement.
- The Council has no funding to replace diesel vehicles with electric or other quieter forms of vehicles.

- Due to the reduced development activities, development contributions which would allow infrastructural improvement works have been significantly reduced compared to previous years.

9 Public Participation

9.1 Public Consultation

In developing the Noise Action Plan and in accordance with the Regulations and the EPA document *Guidance Note for Noise Action Planning for the first round of the Environmental Noise Regulations 2006* (July 2009), Kildare Local Authorities published a Draft Noise Action Plan and sought responses and feedback from statutory bodies and the general public inviting submissions by 7th June 2013.

In addition, a number of stakeholder organisations were approached directly and asked to provide review and feedback on the proposals set out within the Draft Noise Action Plan. Appendix G gives a full list of stakeholders approached in this way.

As part of the wider public consultation Kildare Local Authorities made copies of the Draft Noise Action Plan available to access by the public within all Public Libraries in County Kildare, and by placing an electronic version on the County Council website.

9.2 Response to the public consultation

Appendix H details the results and outcomes of public consultation.

9.3 Handling the responses

Respondents were asked to complete an Information Form in order to ensure that the Authorities would treat their response appropriately. Where respondents asked for their response not to be published the Authorities have regarded it as confidential and will treat it accordingly. However all respondents were made aware that Kildare Local Authorities are subject to the provisions of the Freedom of Information Act 1997 and if asked the

Council may have no option but to release the information in accordance with the requirements of the said legislation.

9.4 Next step in the process

After the Noise Action Plan has been amended, the final report will go to the County Manager for approval. At that stage, copies of the Noise Action Plan will be made available to access by the public within all Public Libraries across County Kildare, and by placing an electronic version on the County Council website. Copies will also be available at a reasonable cost from the Senior Executive Officer (See Section 4.1 for contact details).

10 IMPLEMENTATION OF PLAN

This Noise Action Plan proposes a staged approach to the assessment of any requirement for the mitigation of existing levels of environmental noise due to major roads and major rail within the County.

10.1 Roles and Responsibilities

Kildare Local Authorities are the designated Action Planning Authority as set out within the Environmental Noise Regulations 2006. The Local Authorities are responsible for developing the action plan, and ensuring that the implementation timetable set out below is progressed and reviewed.

The National Roads Authority remains the primary external stakeholder to the Council during the implementation of the action plan, as they are the body responsible for the planning and supervision of works for the construction and maintenance of national roads. Approximately 60% of the major roads within County Kildare are national roads.

Iarnród Éireann with responsibility for the planning and the maintenance of rail network are the secondary external stakeholder.

10.2 Objectives

It is the Authorities' goal to adopt a strategic approach to the management of environmental noise with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health. The Authorities aim to promote a high level of protection and environmental health.

This goal will be considered within the context of sustainable development and how it relates to the strategic objectives of the Council.

The strategy of the Council is to promote all forms of transport in County Kildare and improve access both within the county and to the county by integrating land use planning with an integrated transport system based on sustainability of resources and the development of additional transport infrastructure.

The objective of constructing national roads/motorways is to improve accessibility and journey times consistent with increased levels of road safety.

The objective of constructing other roads, promoting public transport and sustainable modes and development of traffic management plans is to reduce noise and congestion in town centres and in the interests of road safety to remove through traffic especially heavy goods vehicles from accessing town centres, several of which are historic and not designed for such vehicles.

10.3 Programme of Works

The Second Noise Action Plan is to be implemented through a staged process over 5 years, such that the works undertaken within the Action Plan will feed into the third round of strategic noise mapping in 2017. The implementation of the Action Plan will be reviewed and reported within the third round noise action plan due to be completed in 2018.

Year 1 (2014)

- Review strategic noise maps to identify priorities
- Confirmation of extent of impact
- Draw up list of areas for noise mitigation review
- Review the decision support matrix
- Estimate extent of sources under 2017 strategic noise mapping
- Endeavour to put appropriate funding in place to proceed with
(1) the design and (2) the implementation of mitigation.

- Annual report of progress against milestones to Transportation Strategic Policy Committee

Year 2 (2015)

- Noise mitigation review
- Assess identified sites
- Feasibility study for possible mitigation measures
- Cost benefit analysis for feasible measures
- Consider Lakelands Naas and Carton Walk Maynooth as quiet areas in the vicinity of a major road
- Set out data requirements for 2017 strategic noise mapping
- Review County planning development and planning guidance on noise assessment and control
- Annual report of progress against milestones to Transportation Strategic Policy Committee

Year 3 (2016)

- If funding provided, commence implementation of the relevant actions
- Collate, capture and consolidate data required for 2017 strategic noise mapping
- Annual report of progress against milestones to Transportation Strategic Policy Committee

Year 4 (2017)

- Assess implementation and use of guidance on planning and noise

- Produce new strategic noise maps for 2017 assessment year
- Consider Quiet Areas in Open Country
- Annual report of progress against milestones to Transportation Strategic Policy Committee

Year 5 (2018)

- Review impact of Action Plan and amend where appropriate
- Public consultation and finalisation of 2018 to 2023 Action Plan
- Annual report of progress against milestones to Transportation Strategic Policy Committee

10.4 Evaluation, Review and Corrective Action Programmes

The Council will review the effectiveness of noise action planning activities and the budgetary position on an ongoing basis. This will be done by performing an annual review of the progress made in relation to planned activities and reporting on same to the Strategic Policy Committee for Transportation. The effectiveness of these measures at combating local environmental noise exposure will also be considered. If necessary, adjustments may be made to the schedule and nature of planned activities in order to better meet the goals of the action plan.

In 2018 the Council will carry out a review of the program of works implemented under this action plan. Progress and results will be evaluated using information gathered through local assessment of environmental noise exposure. This will include “before and after” evaluations of any noise mitigation measures where appropriate. A review of new noise maps will also be carried out, giving an indication of the change in environmental noise levels and the numbers of people exposed.

11 Summary and Conclusions

This Noise Action Plan has been prepared as required by the Environmental Noise Regulations 2006, Statutory Instrument 140 of 2006. These Regulations give effect to EU Directive 2002/49/EC relating to the assessment and management of environmental noise.

It aims to provide an overview of the requirements of the Regulations, a review of the results of the strategic noise mapping within County Kildare, and set out an approach to the strategic management and control of environmental noise over the next five years.

The objectives of the Kildare Local Authorities noise action plan are to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, due to long term exposure to environmental noise. This will be achieved by taking a strategic approach to managing environmental noise and following a balanced approach in the context of sustainable development. This approach promotes action on environmental noise through four avenues, these being

- Noise reduction at source,
- Land use planning adapted to noise goals,
- Procedures to reduce noise impact and
- Operating restrictions to reduce noise emissions.

This Noise Action Plan primarily considers the long term environmental noise impact from road traffic and rail noise sources, and sets out an approach to review noise impact levels near to the major sources assessed during the strategic noise mapping in 2012. In the interests of equality and promotion of best practice the action plan also sets out a number of proposals for the prevention and avoidance of environmental noise levels detrimental to human

health to be implemented through the planning process, these being applicable throughout County Kildare.

11.1 Summary of Actions

Planning & Development

Increased levels of environmental noise will be prevented and avoided, where possible, within the requirements of the Development Plan, Local Area Plans and sustainable development, through the whole of County Kildare, by integration of noise management into the planning process for the development of new noise sensitive premises, or sources of long term environmental noise, such as road, railways and industrial sites.

- Review County Planning development and planning guidance regarding noise control
- Desire to see noise impact assessments of proposed developments which are below the scale associated with full EIA requirements
- Desire to see noise control measures incorporated into proposals for new developments of noise sensitive premises which attain appropriate internal noise targets
- Assess implementation and use of guidance on planning and noise

Noise Reduction of Existing Sources

In an ideal world, sufficient funding would be provided to mitigate the effects of adverse environmental noise across the county. In practice, the absence of funding means that any noise reduction from existing sources will most likely come from road maintenance activities which are prioritised on the basis of road condition, levels of traffic and road safety

considerations rather than noise levels. It is therefore unlikely that a significant number of people will have an improved noise environment.

Noise reduction of existing sources of long term environmental noise, where necessary, will be considered within the area covered by the strategic noise mapping undertaken by the noise mapping bodies in 2012. The assessment of relevant actions will use the following approach:

- Review strategic noise maps to identify priorities through use of a decision support matrix.
- Confirm the extent of the noise impact through refined noise modelling and/or noise monitoring
- Draw up list of areas for noise mitigation review
- Assess all identified sites
- Feasibility study for possible mitigation measures
- Cost benefit analysis for feasible measures
- Draw up list of cost effective interventions
- Undertake cost effective actions if funding is available.

Preservation of Quiet Areas

The preservation of relatively quiet areas in the vicinity of major noise sources, and quiet areas in the open countryside, will be considered and reviewed as part of the implementation of the noise action plan. Any possible designations which may be recommended by such a process would go to public consultation prior to submission to the Minister for adoption.

Planning for the Third Action Plan

- Prepare relevant information for 2017 strategic noise mapping
- Estimate extent of sources under 2017 strategic noise mapping
- Set out data requirements for 2017 strategic noise mapping
- Collate, capture and consolidate data required for 2017 strategic noise mapping
- Undertake an annual review of progress on implementation of the noise action plan.

Appendix A: Glossary of acoustic and technical terms

Term	Definition
Agglomeration	Major Continuous Urban Area as set out within the Regulations
Attribute Data	A trait, quality, or property describing a geographical feature, e.g. vehicle flow or building height
Attributing (Data)	The linking of attribute data to spatial geometric data
CRN	The Calculation of Railway Noise 1995. The railway prediction methodology published by the UK Department of Transport.
CRTN	The Calculation of Road Traffic Noise 1988. The road traffic prediction methodology published by the UK Department of Transport.
Data	Data comprises information required to generate the outputs specified, and the results specified
dB	Decibel
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
EC	European Commission
END	Environmental Noise Directive (2002/49/EC)
ESRI	Environmental Systems Research Institute
EU	European Union
GIS	Geographic Information System
INM	Integrated Noise Model
Irish National Grid (ING)	The official spatial referencing system of Ireland
ISO	International Standards Organisation
Metadata	Descriptive information summarising data
NA	Not Applicable

Term	Definition
Noise Bands	Areas lying between contours of the following levels (dB): L_{den} <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_d <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_e <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_n <50, 50 – 54, 55 – 59, 60 – 64, 65 – 69, >70
Noise Levels	Free-field values of L_{den} , L_d , L_e , L_n , and $L_{A10,18h}$ at a height of 4m above local ground level
Noise Level - L_d - Daytime	L_d (or L_{day}) = $L_{Aeq,12h}$ (07:00 to 19:00)
Noise Level - L_e - Evening	L_e (or $L_{evening}$) = $L_{Aeq,4h}$ (19:00 to 23:00)
Noise Level - L_n - Night	L_n (or L_{night}) = $L_{Aeq,8h}$ (23:00 to 07:00)
Noise Level - L_{den} - Day/Evening/Night	A combination of L_d , L_e and L_n as follows: $L_{den} = 10 \cdot \log \frac{1}{24} \{ 12 \cdot 10^{((L_{day})/10)} + 4 \cdot 10^{((L_{evening}+5)/10)} + 8 \cdot 10^{((L_{night}+10)/10)} \}$
Noise Level – $L_{A10,18h}$	$L_{A10,18h} = L_{A10,18h}$ (06:00 to 24:00)
Noise Level – $L_{Ar,T}$	$L_{Ar,T}$ = The equivalent continuous A- weighted sound pressure level during a specified time interval, T, plus specified adjustments for tonal character and impulsiveness of the sound.
Noise Level – $L_{eq,T}$	The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T.
Noise Level – $L_{Aeq,T}$	The A-weighted equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. It is used to describe many different types of noise and can be measured directly with an integrating sound level meter.

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Term	Definition
Noise Mapping (Input) Data	Two broad categories: (1) Spatial (e.g. road centre lines, building outlines). (2) Attribute (e.g. vehicle flow, building height – assigned to specific spatial data)
Noise Mapping Software	Computer program that calculates required noise levels based on relevant input data
Noise Model	All the input data collated and held within a computer program to enable noise levels to be calculated.
Noise Model File	The (proprietary software specific) project file(s) comprising the noise model
Output Data	The noise outputs generated by the noise model
OSI	Ordnance Survey for Ireland
Processing Data	Any form of manipulation, correction, adjustment factoring, correcting, or other adjustment of data to make it fit for purpose. (Includes operations sometimes referred to as 'cleaning' of data)
QA	Quality Assurance
RMR	The railway noise calculation method published in the Netherlands in 'Reken- en Meetvoorschrift Railverkeerslawaaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996'.
Spatial (Input) Data	Information about the location, shape, and relationships among geographic features, for example road centre lines and buildings.
WG - AEN	Working Group – Assessment of Exposure to Noise
XPS	The French road traffic noise calculation method published in 'NMPB-Routes-96 (SETRA-CERTULCPC-CSTB)', referred to in 'Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6' and in the French standard 'XPS 31-133'.

Appendix B: Bibliography and references

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Appendix C: Road Strategic Noise Mapping

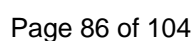


Figure C3: Roads - Strategic Noise Mapping for L_{DEN}

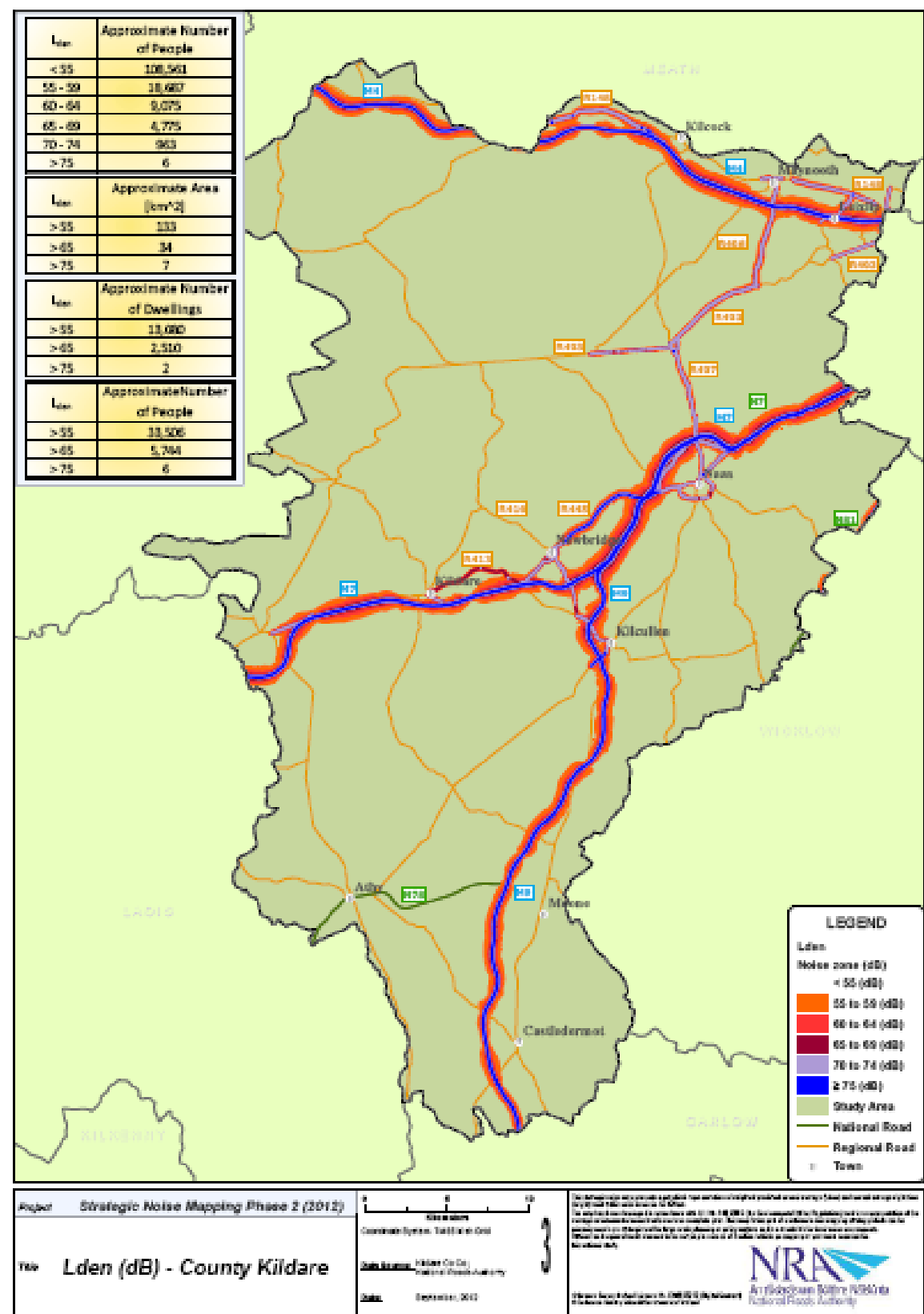
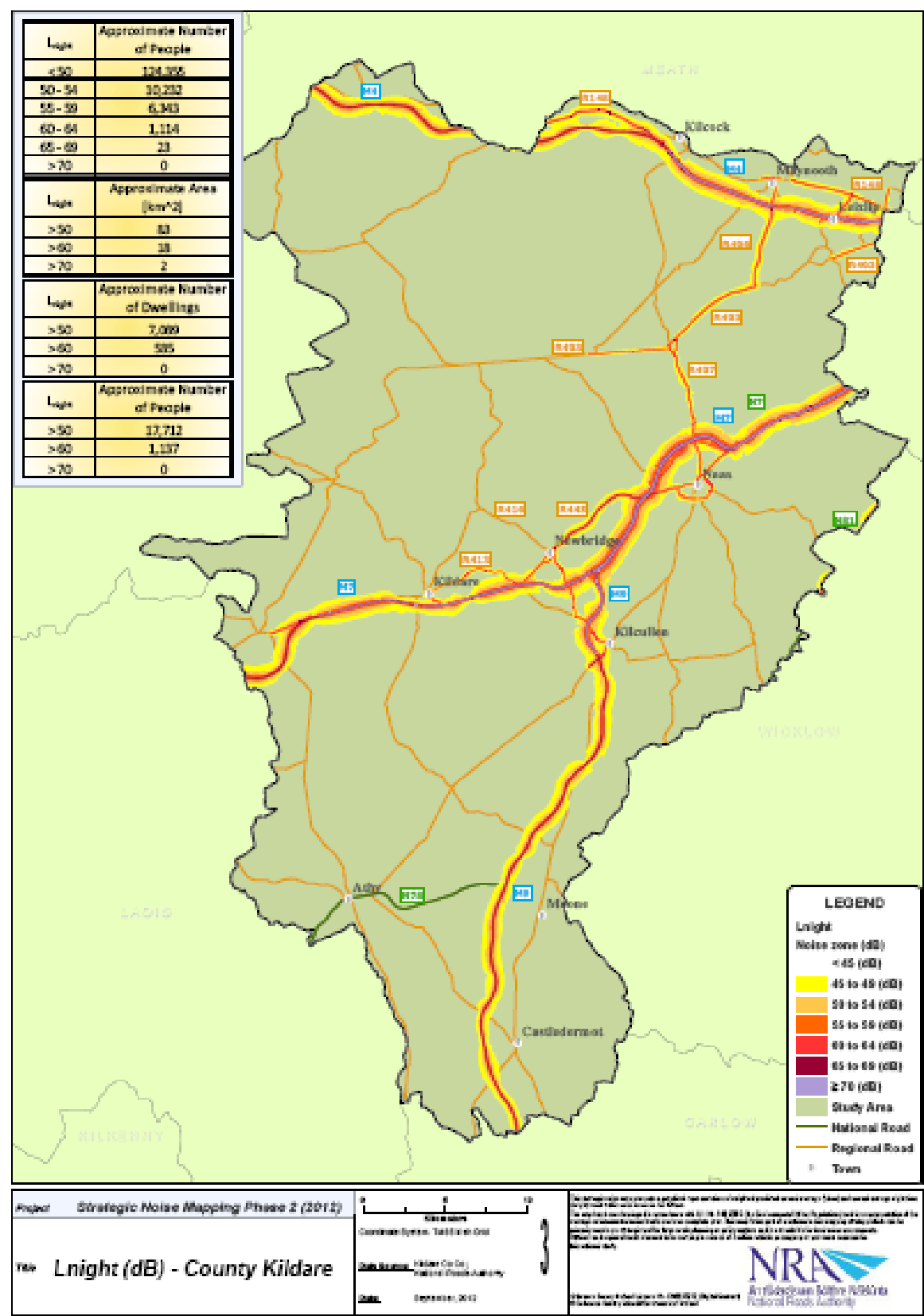


Figure C4: Roads - Strategic Noise Mapping for L_{NIGHT}



Appendix D: Rail Strategic Noise Mapping

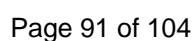
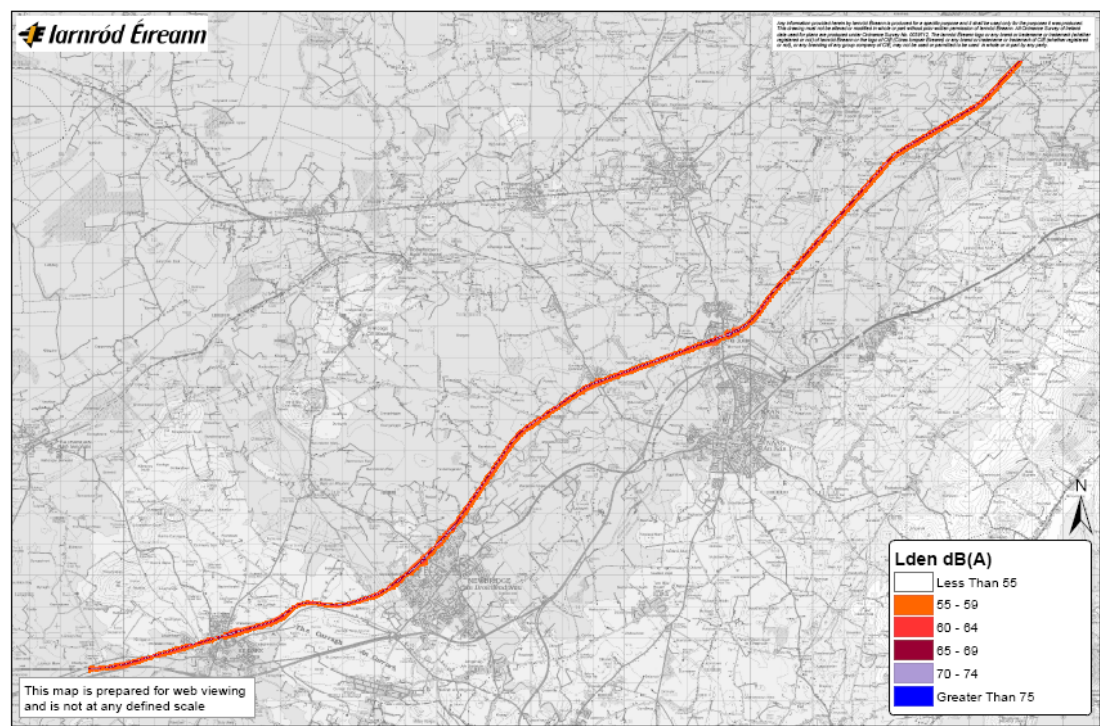


Figure D2: Extent of Major Railways



Figure D3: Rail - Strategic Noise Mapping for LDEN



Average 24 Hour Sound Values (Lden) from Kildare Irish Rail Line

L _{den} dB	Approx Number of People
<45*	21500
45-49	2300
50-54	1900
55-59	900
60-64	600
65-69	600
70-74	0
>75	0

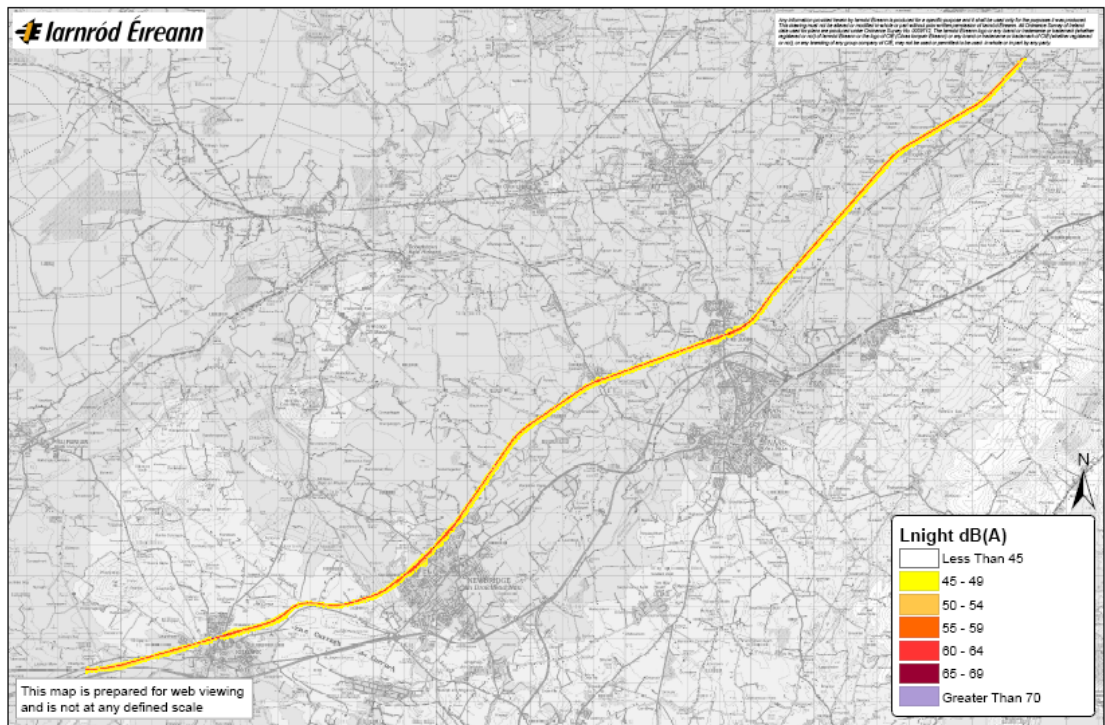
L _{den} dB	Approx Area km ²
>55	5.91
>65	1.5
>70	0.51
>75	0.01

* Approximate number of people within the noise mapping area

L _{den} dB	Approx Number of People
>55	2200
>65	700
>70	0

L _{den} dB	Approx Number of Dwellings
>55	800
>65	300
>70	0

Figure D4: Rail - Strategic Noise Mapping for L_{NIGHT}



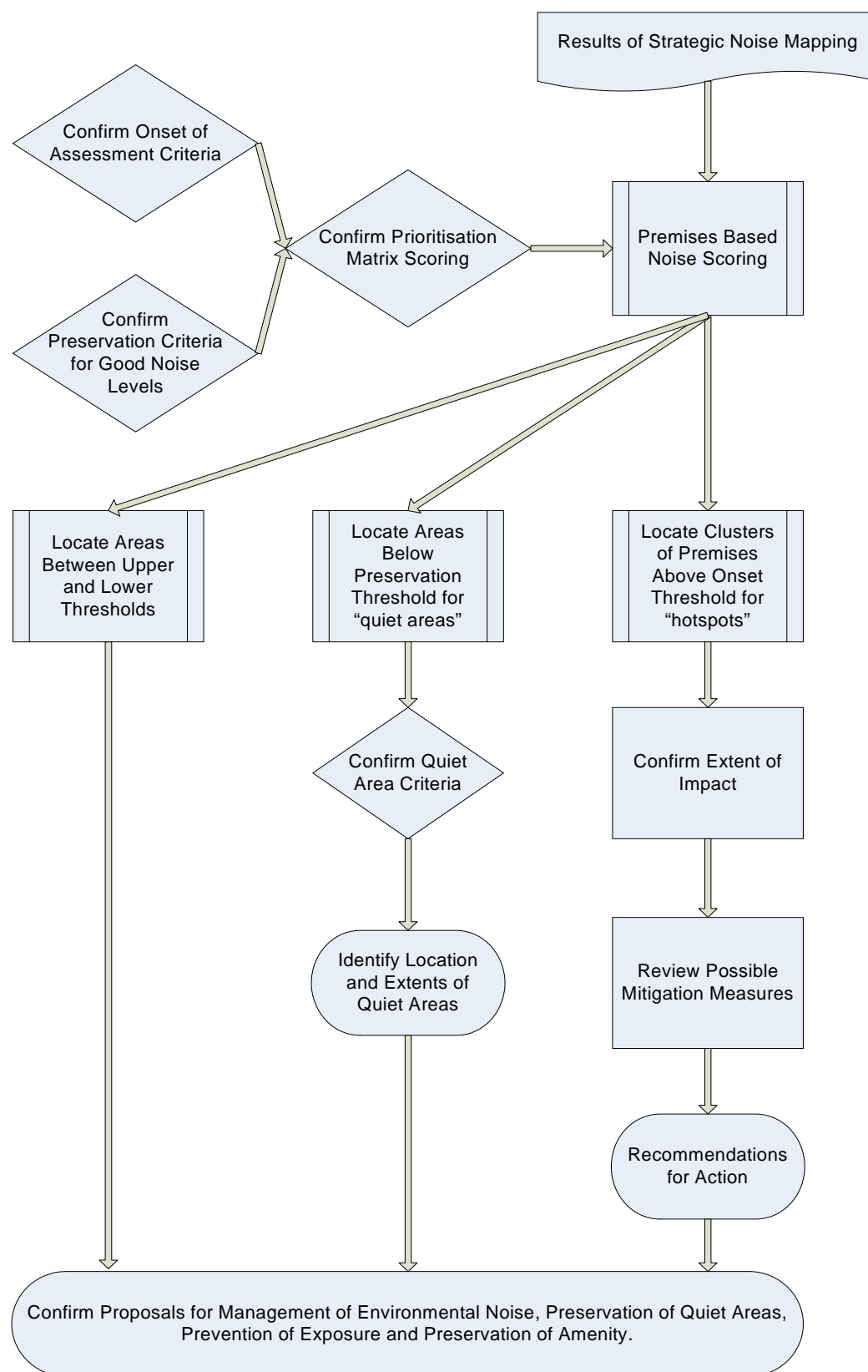
Average 24 Hour Sound Values (L_{NIGHT}) from Kildare Irish Rail Line

L _{NIGHT} dB	Approx Number of People
<45*	25700
45-49	1000
50-54	600
55-59	700
60-64	0
65-69	0
70-74	0
>75	0

* Approximate number of people within the noise mapping area

L _{NIGHT} dB	Approx Number of People
>55	700
>65	0
>70	0

Appendix E: Overview / flow diagram of process for action planning decision making



Appendix F: Decision Support Matrix

A decision support matrix is a chart which enables identification, analysis and rating of the strength of relationships between various sets of information. It enables a number of different factors to be examined and facilitates the assessment of the relative importance of each.

Table F1 presents the prioritisation decision support matrix to be used to support the action planning decision making process.

PRIORITY DECISION SUPPORT MATRIX				
Location				
Decision Selection Criteria		Score Range Lden	Score Range Lnight	Subtotal
Noise Band (dB(A))	<45	5	6	
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75-79	4	6	
	>=80	5	7	
Type of Location	City Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	3	3	
	School	3	1	
	Quiet Area	3	3	
	Recreational Open Space	2	2	
Type of Noise Source	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			Total Score	

Table F1: Example decision support matrix

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Each noise sensitive premises is allocated to one of the “Type of Location” categories, and the noise level at the most exposed façade scored as per the “Noise Band” and the source scored as per the “Type of Noise Source”.

An example of the use of the matrix for a residential property exposed to road traffic noise levels of 71 dB L_{den} and 63 dB L_{night} is shown in Table E2.

Table F2: Example of use of decision support matrix

PRIORITY DECISION SUPPORT				
MATRIX				
Location: 99 Green Road				
Decision Selection Criteria		Score Range L_{den}	Score Range L_{night}	Subtotal
Noise Band (dB(A))	<45	5	6	
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	3
	65-69	2	4	
	70-74	3	5	3
	75-79	4	6	
	≥ 80	5	7	
Type of Location	City Centre	1	1	
	Commercial	1	2	
	Residential	2	3	5
	Noise Sensitive Location	3	3	
	School	3	1	
	Quiet Area	3	3	
Type of Noise Source	Recreational Open Space	2	2	
	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	7
			Total Score	18

A score of approximately 17 or above indicates that the threshold levels have been exceeded and the location should be included in the shortlist for further assessment.

Similarly a location with low noise levels may also score above 17, which then indicates that it should be short listed for consideration as a location where environmental noise levels are currently considered good.

Appendix G: Consultation - Specified Stakeholders

As part of the consultation process, Kildare Local Authorities forwarded a copy of the Draft Noise Action Plan to the following statutory bodies and stakeholder organisations and asked for their comments on the draft plan.

Departments

Department of the Environment, Heritage and Local Government

Department of Transport

Department of Education

Environment Protection Agency

Adjacent Action Planning Authorities

Carlow County Council

Fingal County Council

Laois County Council

Meath County Council

Offaly County Council

South Dublin County Council

Westmeath County Council

Wicklow County Council

Regional Authorities

Dublin Regional Authority

Dublin Transportation Authority

Mid-East Regional Authority

Local and National Pressure Groups

An Taisce

NGO & PROFESSIONAL BODIES

Iarnrod Eireann

Institute of Acoustics

Institute of Public Health

National Roads Authority

National Roads Design Office – Kildare

Waterways Ireland (Dublin)

Appendix H: Consultation – General Public

As part of the public consultation process, Kildare Local Authorities advertised in the local press that the Draft Noise Action Plan was available for comment and made a copy available in all Public Libraries within County Kildare, and on the County Council website.

H.1 Response

There were four responses to the Draft Noise Action Plan as follows:

1. Cllr John McGinley
2. Joe Kelly on behalf of the Kildare Road Design Office
3. Teresa Keating on behalf of the Institute of Public Health in Ireland
4. William Pierce on behalf of Irish Rail

Submission from Cllr. John McGinley

Main Points of Submission

1. Questions point of having a plan if noise environment unlikely to be improved for a significant number of people.
2. Questions whether an increase in numbers affected is due to an increase in the extent of major roads or to deterioration of road surfacing.
3. Proposes that the M4 should be resurfaced with a low noise emitting asphalt.

Response

1. There are two main objectives of a Noise Action Plan. The primary objective is to prevent the occurrence of future noise problems. The secondary objective is to improve the noise environment for people affected by existing high levels. At present, neither central government nor Kildare County Council has allocated funding for the amelioration of environmental noise.

2. Under future actions, the location of residential properties in various noise bands will be determined. At that time, it will be clear whether an increase in the number of people affected is due to an increase in the extent of major roads or to deterioration of road surfacing. Until then, it will be a matter of judgement.
3. While the M4 is not a priority for the resurfacing, it is coming to the end of its design life. At that time, the National Roads Authority will decide on the appropriate resurfacing material taking all factors into consideration.

Submission from Joe Kelly on behalf of the Kildare Road Design Office

Main Points of Submission

1. Proposes changes in wording from “All national roads are designed...” to “All new national roads are designed...” and from “Sallins ByPass” to “M7 Interchange and Sallins ByPass”.
2. Addition of “M7 Naas Newbridge By Pass Upgrade” under Naas

Response

1. Agreed
2. Agreed

Submission from Teresa Keating on behalf of the Institute of Public Health in Ireland

Main Points of Submission

1. The noise mapping results presented commenced at 55dB Lden and 50dB Lnight whereas WHO (2009) acknowledge that adverse health impacts at noise exposure levels above 40dB.
2. Queries the selection of thresholds

Response

1. The noise mapping was carried out in accordance with the specification set out in the S.I No.140 Environmental Noise Regulations, specifically the Fifth Schedule which requires an estimation of people exposed to noise above 50 dB Lnight.
2. There are no statutory noise limits in Ireland for environmental noise. The selection of Lden 70dB and Lnight 57dB as thresholds for assessment of noise mitigation measures was agreed as a compromise between local authorities and the National Roads Authority at the time of the first noise action planning and was not revisited for the second round of noise mapping. In the absence of funding for noise mitigation measures, the likelihood of widespread noise remedial measure is remote.

Submission by William Pierce on behalf of Irish Rail

Main Observations

1. Iarnród Éireann queries the number of people above the Lnight threshold level of 57dB for assessment of noise mitigation arising from rail traffic.
2. Iarnród Éireann supports making the developer responsible for quantifying environmental noise. Quantified assessment should include the predicted noise level (a) within the development with windows closed (b) within the development with windows open and (c) in development amenity areas. It is suggested that a quantified noise assessments should be required for any proposed development within 150m of a railway corridor.
3. Iarnród Éireann suggests permission for residential development should not be granted where noise levels are above 66dB LAeq, 16 hr and 59dB Lnight.
4. Iarnród Éireann expresses their concern that inappropriate developments will impact negatively on the operation of the rail network and highlights that it is a notifiable body for planning

applications where a development might have an impact on rail based transports.

Response

1. The estimated number of people above the Lnight assessment threshold at 1660 was incorrect. It should have read 420 with a corresponding reduction in the number of premises.
2. Kildare County Council has amended the noise action plan to require developers to carry out a quantifiable assessment of the noise environment where a proposed residential or sensitive development is within 150m of a rail corridor and defines some elements of a quantifiable assessment.
3. Kildare Local Authorities notes the proposed thresholds but does not proposed to incorporate them into the Noise Action Plan at this time. However, it will review the decision in reviewing the county guidance on noise assessment and control.
4. Kildare Local Authorities notes the concerns and confirms that one of the principal objectives of a noise action plan is to prevent inappropriate development.