

County Meath Noise Action Plan

2019



Meath County Council

Document Information

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Executive Summary

This Noise Action Plan has been prepared as required by Statutory Instrument 140 of 2006, known as the Environmental Noise Regulations. These Regulations give effect to the EU Directive 2002/49/EC relating to the assessment and management of environmental noise. This Noise Action Plan is aimed at strategic long term management of environmental noise from transport systems i.e. traffic noise.

This plan is being prepared by Meath County Council hereinafter to be known as the "Council" for major roads within their respective functional areas.

The actions detailed herein have been drawn up to assess noise exposure in priority areas, as indicated by strategic noise mapping located on the identified routes within the respective functional areas of the Council. It is envisaged that noise action planning should concentrate on planning strategic issues identified by the noise mapping process as provisions already exist to deal with noise nuisances, including neighbour, entertainment and construction noises.

This Action Plan gives an overview of the main requirements of the Environmental Noise Regulations and the authorities responsible. The methods used in production of strategic noise maps are outlined and summary results are presented. These results are analysed and several recommendations are made as to the best way to limit population exposure to environmental noise pollution.

The results of the strategic noise mapping and population exposure estimation processes indicate that approximately 11,911 people are located within the coverage area of the strategic noise maps. Approximately 11,911 people are indicated to experience traffic noise levels of greater than 55dB(A) L_{DEN} . Whilst approximately 2,232 people are predicted to be exposed to traffic noise levels of greater than 65dB(A) L_{DEN} and approximately 22 people are predicted to be exposed to traffic noise levels of greater than 75dB(A) L_{DEN} ab. Furthermore, less than 3% of people experience traffic noise levels of greater than 50 dB(A) L_{NIGHT} .

There are 15 locations in 4 population centres designated as being noise sensitive, comprising 14 schools and a nursing home. An assessment of the predicted noise exposure levels at these locations indicated that there were no exceedance of the upper limit values for noise assessment which showed a need for priority action based on decision support

criteria. There are a number of noise sensitive locations which should be prioritised for protection due to desirably low levels of traffic noise.

Noise Action Plan Policy Statement

The Council will adopt a strategic approach to managing environmental noise pollution and will aim to assess and prioritise the limitation of environmental noise levels where they are potentially harmful and protect areas which are considered to be desirably quiet or which offer a sense of tranquillity. The Council will take cognisance of acoustical planning in the planning process to endeavour to ensure that future developments include provisions to protect the population from the harmful effects of environmental noise in the interests of residential amenity and public health.

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1 Introduction

1.1 Sound and Noise

The difference between sound and noise can often depend on the perspective of the listener. A sound that is considered bothersome by one individual may not even be noticed by another. Whether it disrupts speech or simply reduces the enjoyment of a garden, noise is almost always undesirable. But how exactly is noise classified and measured? The human ear perceives sound by detecting pressure changes in the air caused by propagating sound waves. Sound, and noise, is measured on a logarithmic scale, to account for the fact that people can detect sounds over a wide range of pressures. These range from approximately $20\mu\text{Pa}$ (Micropascals) known as the Threshold of Hearing, to upwards of 100Pa (Pascals), commonly known as the Threshold of Pain. The ratio between the two is over a million to one. It is for this reason that sound pressure levels (SPLs) are measured in decibels, dB(SPL). The SPL is a logarithmic measure of the average sound pressure, relative to the Threshold of Hearing.

The scale in Figure 1 indicates the range of sound pressure levels which humans can hear and shows some examples of scenarios where they might be experienced. Within the range of audible sound, one must also consider the perception of sound. A doubling of the sound pressure results in a 6dB increase in sound pressure level, however, this does not mean that the sound appears twice as loud. But what level can be considered loud or annoying? The subjective nature of noise annoyance makes defining a specific value a complex task. Furthermore, not all types of sound are perceived in the same manner. The ear does not have a uniform response to all sounds and it is more responsive to certain frequencies. The frequency of the sound is similar to the pitch, low frequency sounds has a bass sound while very high frequency sound is high pitched. Humans can hear sounds with frequencies in the range 20Hz (Hertz) to 20kHz (kilohertz) approximately, but can hear some frequencies better than others. When measuring sound levels this is usually accounted for using frequency weighting. The most commonly used weighting filter is the A-weighting filter. A-weighting of noise levels accounts for the fact that the human ear is more responsive to certain types of sound than others. The A-weighting process applies weightings to different types of noise to better approximate the human perception of sounds. A-weighted sound pressure levels are measured in decibels, dB(A).

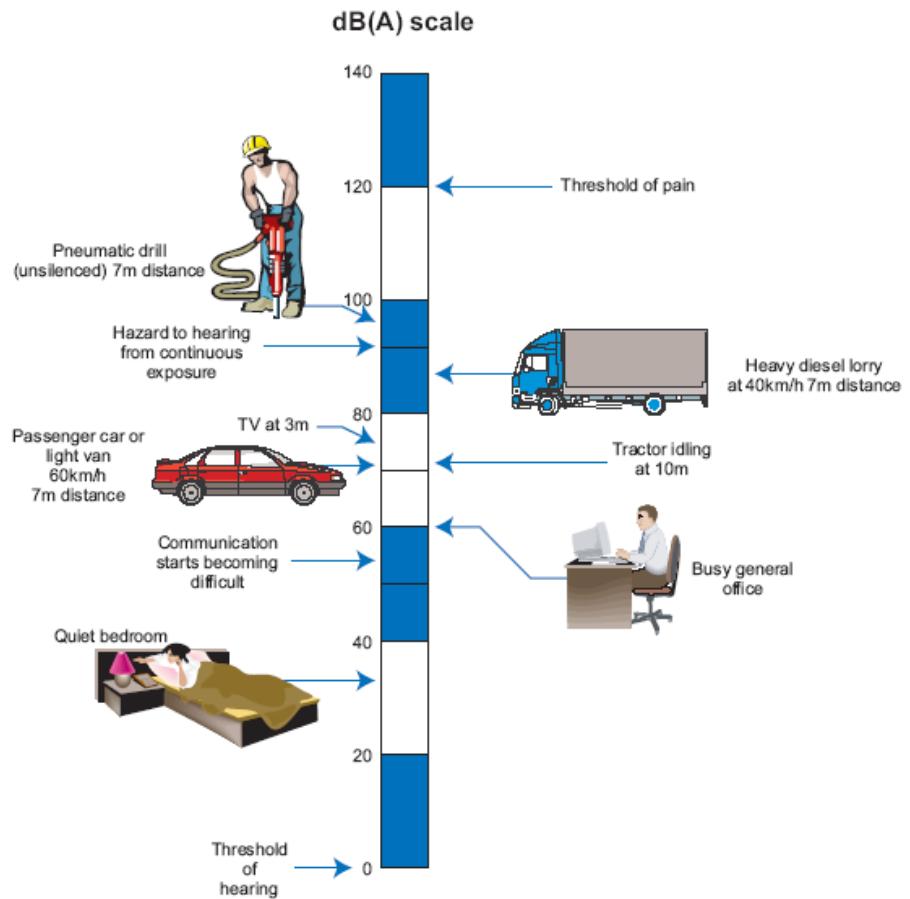


Figure 1: The level of typical common sounds on the dB(A) scale (NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004)

1.2 Noise Indicators

In order to standardise noise measurements and assessment methods a common noise indicator is required. Various statistical indicators exist to define noise levels depending on the manner and duration of the noise in question.

The END specifies two noise indicators to be used when preparing environmental noise maps. These are the L_{DEN} indicator and the L_{NIGHT} which is used to assess sleep disturbance. The L_{DEN} is the day, evening and night time rating level, with weightings applied to noise pollution for the different periods.

L_{DAY} is the A-weighted long-term average sound level measured between 07.00 and 19.00

$L_{EVENING}$ is the A-weighted long term-average sound level measured between 19.00 and 23.00

L_{NIGHT} is the A-weighted long-term average sound level measured between 23.00 and 07.00

The average day, evening and night values are determined over all the respective periods of a year, making the L_{DEN} a yearly average. A 5dB weighting is added to the evening noise value and a 10dB weighting added to the night time level. This is to account for the fact that the same noise level may be more annoying at different times of the day. Consider road works in a residential area at four in the afternoon or four in the morning. The same noise level will be far more annoying during the night time period. The formula used to calculate L_{DEN} is presented in Appendix A.

1.3 Effects of Noise

The effects of exposure to noise pollution are wide ranging. Many people consider only the auditory effects of long term noise exposure, such as hearing loss. However, prolonged exposure to noise levels which may not cause hearing impairment does have other side-effects, most commonly annoyance. Environmental noise can have health effects due to increased stress levels and sleep disturbance. In addition to this, noise exposure can cause such undesirable effects as distraction and loss of productivity in businesses and schools, loss of amenity in public and private areas and reduced concentration spans.

Despite the potential negative impacts of excessive noise exposure, it must be kept in mind that economic growth and commercial developments are always accompanied by a certain level of noise. Local governments are faced with the challenge of finding a balance between commercial growth and environmental management which must protect the general population while having regard for the necessity and value of many of the activities which cause noise emissions.

1.4 Purpose and Scope of the Environmental Noise Directive

In 2002 the European Union issued a Directive (2002/49/EC) relating to the assessment and management of environmental noise pollution. Also known as the Environmental Noise Directive, the Directive's main aim is to put in place a European-wide system for identifying sources of environmental noise pollution, informing the public about relevant noise data and then taking the necessary steps to avoid, prevent or reduce, on a prioritised basis, noise exposure. The basic principles and requirements of the END can be summarized as follows:

Noise Assessment

The Directive aims to monitor environmental noise problems by requiring competent authorities in Member States to generate strategic noise maps for major roads, railways, airports and agglomerations, using the harmonised noise indicators L_{DEN} (day-evening-night average sound level) and L_{NIGHT} (night time average sound level). These maps are to be used as a means of presenting environmental noise data, as a source of information for the public and as an aid in the preparation of noise action plans.

All member states are required to develop strategic noise maps describing the environmental noise situation within their territories. The first phase of these noise maps was due by 30th of June 2007 and the second phase was delivered in June 2012. The 3rd round of Action Plans are to be submitted to the EPA for final review in September 2018. Updated versions of the strategic noise maps are due every five years thereafter.

Strategic noise maps present environmental noise level data in terms of a relevant noise indicator. Their purpose is to allow authorities to identify areas where a noise limit value may have been exceeded, estimate the number of people potentially exposed to environmental noise and evaluate the contribution of various noise sources to the overall noise situation.

Development of Action Plans

The Directive aims to address local environmental noise issues by requiring competent authorities to draw up action plans to reduce the harmful effects of exposure to environmental noise where necessary and maintain the environmental acoustic quality where it is good. The Directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities.

Action plans outline the measures which competent authorities intend to take to assess any environmental noise issues identified during the strategic mapping process. This includes the prioritisation of actions to reduce environmental noise levels where exposure is deemed to be high and the preservation of the noise situation in locations which have been designated as quiet areas.

Disseminating Data to the Public

One of the underlying themes throughout the Directive is the dissemination of noise data to the general public using channels and media that are both suitable and effective. The Directive instructs that the public be made aware of any noise assessment data, be consulted during the formulation of action plans and informed of any decisions taken.

The overall goal of these actions is to develop a long-term EU strategy, which includes objectives to reduce the number of people affected by noise and provide a framework for developing existing community policy on noise reduction from major sources.

The Directive is aimed at establishing harmonised EU measures to reduce noise emitted by the major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and also at providing a basis for developing and complementing the existing set of community measures concerning environmental noise. The Directive applies to environmental noise to which humans are exposed, in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise sensitive buildings and areas. It does not apply to noise that is caused by the exposed person, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas. Noise maps are strategic tools and should not be used for the assessment of local noise nuisances.

1.5 Purpose and Scope of the Environmental Noise Regulations

Statutory Instrument No. 140 of 2006, also known as The Environmental Noise Regulations, was brought into effect by The Minister for the Environment, Heritage and Local Government, for the purpose of giving effect to European Council Directive 2002/49/EC relating to the assessment and management of environmental noise. The Regulations were brought into force in accordance with the powers conferred on The Minister by sections 6, 53 and 106 of the Environmental Protection Agency Act 1992 (No. 7 of 1992), as amended by Part 2 of the Protection of the Environment Act 2003 (No. 27 of 2003).

The Environmental Noise Regulations provide for the implementation in Ireland of a common approach within the European Community intended to avoid, prevent or reduce, on a prioritised basis, the harmful effects, including annoyance, due to exposure to environmental noise.

The Regulations apply to environmental noise to which people are exposed. As with the Directive itself, the Regulations do not apply to nuisance noise which can be dealt with under the Environmental Protection Agency Act 1992.

1.6 Roles and Responsibilities of Dedicated Bodies

The Regulations designate the Environmental Protection Agency (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 in accordance with Article 10(2) of the Directive.

1.6.1 Noise Mapping Bodies

Under the Environmental Noise 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 Dún Laoghaire-Rathdown, Fingal, and South Dublin;
- For major railways, Iarnród Éireann or the Railway Procurement Agency, as appropriate, on behalf of the action planning authority or authorities concerned;

For major roads,

- i. where such roads are classified as national roads in accordance with Section 10 of the Roads Act 1993 (No. 14 of 1993), Transport Infrastructure Ireland, on behalf of the action planning authority or authorities concerned, and

- ii. other than those provided for in part (i), the relevant road authority or authorities, as appropriate; and
- For major airports, the relevant airport authority, on behalf of the action planning authority or authorities concerned

Responsibilities

The relevant noise mapping bodies are required to produce strategic noise maps, in respect of the calendar year 2018, for:

- Any agglomeration with a population greater than 250,000;
- Any major road with more than 3 million vehicle passages per year;
- Any major railway with more than 30,000 train passages per year; and
- Any major airport.

The Regulations also state that the designated noise mapping bodies are required to make a strategic noise map or revised map, as appropriate, for each of the following areas, in respect of the calendar year 2018:

- An agglomeration with more than 250,000 inhabitants;
- A major road; and
- A major railway
- Any major airport

A major road is defined as any motorway, regional or national road with more than 3 million vehicle passages per year, while a major railway is any railway with more than 30,000 passages per year.

The definitions of major noise sources applicable for the 2018 round of strategic noise mapping will be used for all future rounds of noise mapping and action planning.

1.6.2 Action Planning Authorities

Under the Environmental Noise 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, the Council are designated as the action planning authority for all sections of major roads within the functional areas of the Council which experience a volume of traffic greater than 3 million vehicle passages per year. There are no other major sources of environmental noise within the functional areas of the Council which qualify for noise mapping or inclusion in the action planning process.

Responsibilities

Action planning authorities are responsible for the making and approval of noise action plans, in consultation with the Agency and the noise mapping body for the noise map involved. Action plans must satisfy the minimum requirements set out in the Fourth Schedule of the Regulations.

Action planning authorities are required to ensure that:

- the general public and interested stakeholders are consulted on proposals for action plans;
- the general public and interested stakeholders 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 general public and interested stakeholders 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.

1.7 Key Phases

The key phases involved in meeting the requirements of the Regulations are laid out below. The responsibility is shared between the noise mapping bodies and action planning authorities.

1.7.1 Identification of Areas for Noise Mapping

Strategic noise maps were developed for all roadways meeting the criteria set out in Article 10(1) of the Regulations, specifically any motorway, regional or national road with more than 3 million vehicle passages per year. Road traffic volumes were obtained using the National Roads Authority's/Transport Infrastructure Ireland (NRA/TII) traffic counting system and local traffic counts. Data gathered by the NRA/TII and local authorities was used to identify roadways which were eligible for mapping.

1.7.2 Preparation of Strategic Noise Maps

Purpose and Scope

According to the END a strategic noise map is “A map designed for the global assessment of noise exposure in a given area or for overall predictions for such an area.” A noise map is a representation of the noise situation in a given area, presented in terms of a chosen noise indicator.

The most common format for noise maps is a graphical representation of the noise levels in an area. Colour coded contour plots show the areas subject to the highest noise levels, and link areas of equal noise exposure.

Noise mapping techniques employ predictive software that estimates the noise level in an area from a particular source, given several governing factors e.g. speed of the traffic flow, number of light and heavy vehicles, building topology, road surface and gradient.

The maps are intended to provide a representation of the possible noise levels perceived within the assessment area due to a particular source and are used to identify locations where action may be needed to reduce high noise levels and protect the acoustic environment where favourably low noise levels are present.

Extent/Range

The noise maps generated by the responsible noise mapping bodies and subsequently presented to the European Commission by the EPA are plotted in graphical form in terms of L_{DEN} . They are presented in 5dB contour bands beginning at 55-59dB and ranging up to 70-74dB. The maps also provide an indication of environmental noise levels close to a major noise source which are less than 55dB and greater than 75dB. The noise levels indicated are predictions attributed only to a specific source of noise i.e. road traffic.

A second set of maps were also generated for use in developing action plans. These maps, covering the same areas, are plotted in terms of L_{NIGHT} , the night time noise indicator.

Noise Mapping Bodies Responsible

Under Article 6(d) of the Regulations, the National Roads Authority/Transport Infrastructure Ireland is designated as the noise mapping body responsible for the mapping of all major national roads within Ireland, whilst the County Councils are responsible for mapping all major non-national roads within their respective areas of control. During the noise mapping carried out in 2017 the NRA/TII undertook the assessment of noise from non-national roads on behalf of the County Councils based upon information supplied to the NRA/TII by the Councils.

1.7.3 Development of the Noise Action Plan

Purpose and scope

Noise action plans are aimed at defining a common approach intended to avoid, prevent and reduce the harmful effects of exposure to environmental noise and also at protecting quiet areas. They will form the basis of a long term environmental noise strategy and are not tools for dealing with nuisance noise complaints.

Extent/Range

The provisions of the action plans are based on the results of the noise mapping process. The noise mitigation measures contained within action plans deal with potential issues identified during strategic noise mapping, with a view to assessing and evaluating the need to manage high levels of exposure to environmental noise.

Public Participation and the Role of the Public

Public participation and dissemination of data to the public are integral parts of the END and the Environmental Noise Regulations. The public should be consulted at all stages of the policy development and implementation. The role of the public is to review and guide the formulation of strategic noise policy with a view to avoiding, preventing and reducing, where necessary, harmful effects caused by exposure to environmental noise. Their role is not to highlight individual instances of noise annoyance, but to contribute to an overall best approach to widespread environmental noise reduction.

Implementation of the Plans

Noise action plans will span a 5 year time scale. They detail planned activities in each year and include a program review before the end of the action plan time frame.

2 Existing Noise Management Legislation

The following section highlights some of the existing legislation in place within Europe, Ireland and County Meath regarding noise control and reduction. These regulations deal with noise on a number of levels; noise reduction at source, management of nuisance noise and consideration of noise at the planning stage.

2.1 European Legislation

2.1.1 Aircraft Noise

2.1.1.1 Noise Operation Restrictions at EU Airports – Directive 2002/30/EC

Directive 2002/30/EC defines rules for establishing noise related operating procedures at airports within EC Member States. The Directive deals with four main elements of noise at airports, namely; reduction of aircraft noise at source, land use planning and management, operational procedures which mitigate noise and operational restrictions which limit noise.

2.1.2 Outdoor Machinery – Directive 2000/14/EC

The operation of outdoor machinery is a significant source of noise nuisance and annoyance in all communities. Directive 2000/14/EC aims to provide a framework for managing the noise emitted by a wide range of machinery from large construction machinery to domestic equipment such as lawnmowers. The legislation was amended in 2005 with Directive 2005/88/EC which reduced noise limits for certain machinery. The Directive has been transposed into Irish Law through S.I. 632 of 2001 and subsequently through S.I. 214 of 2006.

2.1.3 Recreational Craft – Directive 2003/44/EC

Directive 2003/44/EC is an amendment to Directive 94/25/EC regarding the regulations governing recreational craft, such as motorboats and powered water craft which have an engine and exhaust system. The Directive sets out maximum permissible sound emission levels and describes a test procedure.

2.1.4 Road Traffic Noise

2.1.4.1 Motor Cycles - Directive 97/24/EC

Directive 97/24/EC defines the standards for two and three wheeled motor vehicles which can operate in the EU member states, including maximum sound emission levels. Annex I of the Directive sets out the limit values and test specifications for ensuring compliance.

2.1.4.2 Motor Vehicles - Directive 70/157/EEC

The EC have issued numerous successive pieces of legislation aimed at reducing the noise emitted by motor vehicles. These regulations are aimed at tackling vehicle noise at source by setting standards for manufacturers to ensure that vehicles adhere to permissible sound levels for engine emissions and pass-by tests. The regulations were initially introduced in 1970 through Directive 70/157/EEC, which has since been amended to include type approvals through Directive 92/97/EC. An updated test procedure was introduced in 2007 to test under conditions more representative of real life driving.

2.1.4.3 Tyres for Motor Vehicles and Their Trailers - Directive 2001/43/EC

In order to qualify for sale in the EU all vehicles must obtain certain type approval, based on a number of technical standards. Directive 2001/43/EC regulates the noise from tyres on motor vehicles and includes emission levels and test procedures.

2.2 National Legislation and Guidance

2.2.1 Environmental Protection Agency Act 1992

The EPA 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.” The sections of the Act relevant to noise pollution are:

Section 106 – Regulations for Control of Noise

This section gives the Minister for Environment, Heritage and Local Government the power to make regulations for the purpose of preventing or limiting noise. This may include imposing noise limits, controlling sources of noise and the imposition of charges for noise pollution.

National and regional transport initiatives that may arise from implementation of the National Planning Framework and the Regional Spatial and Economic Strategy for the Eastern and Midlands Region have the potential to result in, *inter alia*: adverse health effects that will need to be mitigated; and/or beneficial effects with regard to preserving environmental noise quality. Such issues will be considered during the implementation of the National Planning Framework and the Regional Spatial and Economic Strategy, including as part of the environmental assessments, where required, for individual transport initiatives.

Section 107 – Power of Local Authority or Agency to Prevent or Limit Noise

This section gives powers to Local Authorities or the Environmental Protection Agency to control and limit noise from any premises, process or work.

Section 108 – Noise as a Nuisance

This section gives provision for Local Authorities, the EPA or any individual to complain to the District Court regarding noise nuisance causing unreasonable annoyance. The Court may order the offending person or body to take specific measures to limit or prevent noise pollution.

The EPA Act provides a method for dealing with nuisance noise in the community. It does not however, address environmental noise pollution in the long term. The END, enacted through the Environmental Noise Regulations, is the beginning of a framework to develop long term strategic policies to assess and manage environmental noise pollution and protect the public from potentially harmful effects of exposure to environmental noise.

2.2.2 The Roads Act 1993

Under section 77 of the Roads Act 1993, power is given to the Minister to make regulations requiring relevant road authorities to take measures to mitigate the effects of road traffic noise. The Minister may also specify limits for road traffic noise which, if exceeded, would require mitigating action from the road authorities.

There are currently no Irish limits or standards for governing road traffic noise, or its assessment on either new or existing roads.

2.2.3 Transport Infrastructure Ireland Guidelines

In light of the lack of standardised methods for the assessment of road traffic noise the NRA/TII published the “*Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*” In March 2014. These guidelines propose design goals for noise related to both the construction and operational stages of new road schemes. Following a review of similar guidelines in the UK and adapting methodologies in line with the requirements of the END, the Authority proposed an operational design goal of 60dB(A) L_{DEN} free field value including reflections from the façade i.e. a limit value of 60dB(A) measured at any dwellings close to the road. Essentially what this means is that for any new road scheme the Environmental Impact Statement must take this target into account with regard to any existing sensitive residential property likely to be affected by the road scheme. The guidelines present an approach to mitigating the adverse effects of road construction in so far as possible through the use of measures such as alignment changes, barrier construction and the use of low noise road surfaces. The responsibility for noise mitigation policy relating to any proposed new sensitive properties in the vicinity of the road scheme lies with the relevant Planning Authority.

2.2.4 Integrated Pollution Prevention Control Licensing

The EPA’s Integrated Pollution Prevention Control Licensing terms require that certain bodies must limit environmental pollution caused by industrial activities in order to obtain a license to operate. The criteria relating to noise pollution are outlined in the EPA publication “*Guidance Note for Noise In Relation To Scheduled Activities*.” This document recommends a “Best Available Technique” approach to the assessment and mitigation of noise pollution. This approach should take into account the nature of the noise e.g. constant, impulsive or tonal, the nature of the surrounding environment and the time and duration of noise emissions. The document contains guideline values that can be applied on a general level. Noise attributed to activities on a licensed site should not exceed 55dB $L_{Ar,T}$ at any noise sensitive location during the daytime period (08:00 – 22:00). ($L_{Ar,T}$ is 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). During the night time (22:00 – 08:00) the noise from on site activities should not exceed 45dB $L_{Aeq,T}$. ($L_{Aeq,T}$ is

the equivalent steady A-weighted sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period T).

In addition to these general limits, the guidance note states that “the noise from the licensed facility should not be so loud, so continuous, so repeated, of such duration or pitch and it should not occur at such times as to give reasonable grounds for annoyance.”

2.2.5 Building Regulations 1997-2014 (Part E – Sound)

Part E of the Building Regulations (Amendment) 2014 (S.I. no. 606/2014) relates to the mitigation of sound transfer between dwellings and rooms within a building. The regulations simply state that walls and floors must have “reasonable resistance” to airborne and impact sound. This concerns sound transmission within a structure such as between apartments or semi-detached housing. It does not account for noise sources outside the building. No consideration is given to the nature or location of the building or potential noise sources. More comprehensive regulations could include façade noise insulation guidelines and appropriate standards to be met before habitation.

2.2.6 Wind Energy Planning Guidelines

Wind turbine developments are subject to operational reviews regarding noise emissions on site and at noise sensitive locations in the vicinity. In 2011 the EPA published the “*Guidance Note on Noise Assessment of Wind Turbine Operations at EPA Licensed Sites*” which proposes limits for noise from wind turbines and outlines an assessment procedure. The proposed limits for site and turbine noise are: daytime value of 55 dB L_{Ar,T}, a night time value of 45 dB L_{Aeq} at the nearest noise sensitive location and wind turbine noise should never exceed 45 dB L_{Aeq} or contain tonal components.

2.3 Regional and Local Legislation and Guidance

2.3.1 County Meath Development Plan 2013-2019

The County Meath Development Plan 2013-2019 was adopted on the 17th December 2012 and came into effect on the 22nd January 2013. The Development Plan describes the goals and policies of Meath County Council relating to a broad range of key strategic issues which will guide the development of the County in the coming years. Environmental concerns are a key aspect in all areas of the Development Plan, as efforts are made to balance protection

of the natural environment with economic growth, transport initiatives, housing and planning. Noise considerations in particular span a number of categories as the Council has taken cognisance of the importance of noise in the planning process.

2.3.1.1 Development within the Noise Zones of Dublin Airport

The noise zones of Dublin Airport extend over parts of County Meath. Development within these zones is resisted in order to minimize the adverse effects of noise. Maps of the noise zones can be found in Volume 3 of the County Development Plan. National and regional transport initiatives that may arise from implementation of the National Planning Framework and the Regional Spatial and Economic Strategy for the Eastern and Midlands Region have the potential to result in, *inter alia*: adverse health effects that will need to be mitigated; and/or beneficial effects with regard to preserving environmental noise quality. Such issues will be considered during the implementation of the National Planning Framework and the Regional Spatial and Economic Strategy, including as part of the environmental assessments, where required, for individual transport initiatives.

It is the policy of Meath County Council:

"to strictly control inappropriate development and require noise insulation where appropriate within the Outer Noise Zone, and actively resist new provision for residential development and other noise sensitive uses within the Inner Noise Zone. Under no circumstances shall any dwelling be permitted within the predicted 69dB L_{Aeq} 16 hours noise contour. Comprehensive noise insulation shall be required for any house permitted. Any planning application shall be accompanied by a noise assessment report produced by a specialist in noise assessment which shall specify all proposed noise mitigation measures together with a declaration of acceptance of the applicant with regard to the result of the noise assessment report."

And also:

"to restrict development which would give rise to conflicts with aircraft movements on environmental or safety grounds on lands in the vicinity of Dublin Airport and on the main

flight paths serving Dublin Airport, and in particular restrict residential development in areas likely to be affected by levels of noise inappropriate to residential use.”

2.3.1.2 Wind Energy

Developments of wind turbine facilities are subject to a number of planning and operational criteria including good acoustical design and guarantees that there is no significant increase in ambient noise levels which would affect local residences, wildlife or the general tranquility of the area.

2.3.1.3 Extractive Industries

Regulation of extractive industries requires Local Authorities to find a balance between facilitating economic growth, creating employment and protecting the natural landscape and local population from unwanted effects of heavy industry. The County Development Plan makes provisions to support extractive industries where it does not unduly compromise the environmental quality of the county. The influence on environmental quality is judged on a number of factors, including noise. Proposals for new developments in particular are required to address the noise impact on local communities in detail in planning proposals.

2.3.1.4 Business Development

The potential noise impact of new business developments on local dwellings and communities are highlighted as a key consideration in the planning process for any proposed ventures. A wide range of developments are addressed including, but not limited to, industrial and office facilities, sports facilities, petrol stations, home businesses and childcare facilities. The Council have incorporated consideration of noise emissions and annoyance into guidelines and policies governing the planning and operation of commercial developments with the aim of protecting local residents and preserving natural and public amenity.

2.3.2 County Meath Noise Action Plan 2013-2018

In 2013 Meath County Council published a Noise Action Plan in line with the requirements of the Environmental Noise Regulations (S.I. 140 of 2006). The Noise Action Plan outlines the Council’s strategic approach to reducing the harmful effects of exposure to environmental noise and the protection of the acoustic environment in the interest of preserving public

amenity and protecting public health. The Plan was based on the results of the first round of strategic noise mapping, as detailed in section 1.7.2. This document is a revision and update of the 2013-2018 Noise Action Plan.

2.4 Noise Assessment for Action Planning

At present there is no existing legislation that limits environmental noise levels to a particular value. Several difficulties arise when attempting to choose a reasonable value for noise level limits, mainly due to the subjective nature of noise exposure and annoyance. The effects of noise exposure are highly dependent on the perception of the exposed person and the effectiveness of noise reduction can often be dependent as much on relative changes as on absolute levels. Attempting to apply the same limit value to a city centre park and rural country side may be inappropriate, despite the fact that both can be perceived as tranquil areas relative to the surroundings.

In line with current best practice a set of guideline values are proposed as onset limits for the prioritisation of noise management relating to road traffic noise. These are given below.

Onset levels for noise mitigation measures:

- 70dB(A) L_{DEN}
- 57dB(A) L_{NIGHT}

Onset levels for measures to preserve the existing noise situation:

- 55dB(A) L_{DEN}
- 45dB(A) L_{NIGHT}

These levels reflect an annual average 24 hour period.

These values were decided upon after a review of guidance values issued in other countries and other relevant documents e.g. the UK values, and the NRA/TII guidelines for treatment of noise. These values can be seen as indicative criteria in the decision making process. Combined with the graphical results of noise mapping, consideration of the number of

people exposed and the type of property the guidelines provide a useful framework for assessing noise impact.

3 Description of the Action Planning Area

County Meath covers an area of approximately 2,342km². The recorded population in the 2016 census was 194,942. There were no agglomerations, major railways or airports identified for noise mapping within County Meath.

3.1.1 Major Roads for Noise Mapping

Within the boundaries of County Meath there are approximately 174km of national roads and 71km of regional roads which qualify as major roads for noise mapping. Descriptions of these road sections are provided in the tables below.

Road	Approximate Length (km)	Location
M1	14.3	County border east of Gormanstown to the county border at the River Boyne, west of Drogheda
M2	10.9	County border at Ward Lower to the end of the M2 at Rath
M3	50.1	County border at Clonee to the end of the M3 southwest of Kells
M4	36.7	County border at the Ballycorron river southeast of Enfield to the county border at the River Blackwater at Martinstown and from the county border at the River Boyne southeast of Clonard to the county border at Kinnegad
N2	30.1	Junction of M3 and N2 at Rath to the county border northeast of Slane
N3	25.1	The end of the M3 southwest of Kells to the county border at Derver.
N51	6.8	The junction with the R163 at Slane Castle Domain to the county border at Rossin

Table 1: Description of national roads eligible for noise mapping

Road	Approximate Length (km)	Location
R125 and R155	6.3	Centre of Ratoath village to west of Greenogue
R132	7.8	The exit to the M1 at Richardstown to the county border at Stameen
R147	31.1	Adjacent to the M3 between Pace and Dunshaughlin, Clonee to the county border, and Philpotstown to the north side of Navan.
R148	12.3	From the county border east of Enfield to the Enfield ring road and from the ring road to the county border west of Enfield. Also from the county border at Leinster Bridge to the county border at Kinnegad
R149	2.4	Clonee village to the county border at Ongar Village
R153	2.0	The River Boyne in Navan town centre to the junction with Metges Road
R160	0.7	Trim Outer Relief Road
R161	2.8	Navan town centre at Railway Street to the Balreask junction
R162	5.5	Junction with the N51 in Navan town to the junction with the R163 at Kilberry.

Table 2: Description of regional roads eligible for noise mapping

3.1.2 Description of the General Population

There are four main population centres which fall within the areas covered by the strategic noise maps. These are Julianstown, Navan, Slane and Ratoath.

There are also ribbon settlements along roads classified as major roads for strategic noise mapping. These are more common on regional roads. Larger developments such as motorways and national routes have fewer dwellings in the vicinity due to noise impact mitigation at the planning and route selection stages.

3.1.3 Noise Sensitive Locations

Noise pollution is considered to have a greater impact at certain locations and certain building types are considered to be more sensitive than others. The main priority of the END is to reduce environmental noise exposure in residential areas, and as such, dwellings are always considered to be noise sensitive. It is also recommended that competent authorities designate buildings such as educational and health care facilities as being noise sensitive. Accordingly, for the purpose of noise action planning and assessment of possible actions the following locations are considered noise sensitive:

- Schools
- Hospitals
- Nursing Homes

The following locations were selected because of their proximity to major roads and within the coverage areas of the strategic noise maps. Other potentially noise sensitive such as places of worship and public parks lie within these areas. While these locations will not be directly assessed for potential noise management actions, they will be considered in the wider strategy for the reduction of environmental noise exposure throughout the County.

Julianstown	
Name	Category
Whitecross National School	School
Moorehall Nursing Home	Nursing Home

Table 3: Noise sensitive locations in Julianstown

Navan	
Name	Category
County Meath VEC	School
Flowerfield National School	School
Navan Education Centre	School
Schoil Mhuire	School
St Anne's Loreto Primary School	School
St Joseph's Mercy Primary School	School

St. Michael's Loreto Secondary School	School
St. Oliver Plunkett National School	School
St. Patrick's Classical School	School
St. Paul's National School	School
St. Ultan's	School

Table 4: Noise sensitive locations in Navan

Ratoath	
Name	Category
Ratoath Junior School	School

Table 5: Noise sensitive locations in Ratoath

Slane	
Name	Category
St. Patrick's National School	School

Table 6: Noise sensitive locations in Slane

3.2 Review of 2013 Noise Action Plan Implementation

The 2013 Noise Action Plan includes a program of review to measure progress of planned actions and assess the impact of significant developments and any noise mitigation efforts undertaken.

3.2.1 Significant Developments

There has been no significant developments in County Meath since the publication of the 2013 Noise Action Plan.

3.2.2 Implementation Planned Actions

Among the listed actions in the 2013 Noise Action Plan was the incorporation of better noise policy into the County Development Plan. The consideration of environmental noise at the planning stage of developments will allow for significant improvement in the acoustic quality of existing and future developments by providing planners with greater tools to assess and control the potential noise impact in sensitive areas. The County Development Plan includes noise considerations based on the 2013 Noise Action Plan. This is considered to be an important step in the ongoing implementation of the Council's Noise Action Plan Policy aimed at protecting the population from the harmful effects of environmental noise.

Due to limited resources a number of actions were not completed during the lifetime of the 2013 Noise Action Plan. These included designation of Quiet Areas in Open Country within County Meath by the Minister and detailed field assessments at priority locations. These items will be completed as part of this Noise Action Plan.

A review of the latest noise maps against the 2013 case has indicated an improvement in the environmental noise situation. While direct comparisons between the latest round of noise mapping results and those from 2013 are difficult due to increased lengths of road to be monitored in some cases and other sections of road being omitted. Where comparisons are possible there has been an increase in the number of people estimated to be exposed to environmental noise overall.

4 Responsible Authority for Noise Action Planning

The County Council is responsible for the production and implementation of the Noise Action Plan for County Meath.

Name and Contact Details:

Meath County Council

Buvinda House,

Dublin Road,

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Telephone: +353 (046) 9097000

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

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Buvinda House,

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Co. Meath,

5 Summary of the Results of Noise Mapping

5.1 Overview of the preparation of the noise maps

This section outlines the process involved in the development of the noise maps, including the data sources, calculation methodology and authorities responsible.

5.1.1 Responsible Authorities

The Environmental Noise Regulations require the NRA/TII to develop noise maps for every major road classified as a national road while the responsibility of mapping non-national roads rests with the relevant Local Authority within whose functional area the road is located.

In September 2016, a centralised approach to the noise mapping of major roads outside agglomerations was adopted. The National Roads Authority/Transport Infrastructure Ireland, being designated the Noise Mapping Body for all major national roads, and on behalf of Local Authorities responsible for non-national roads, prepared strategic noise maps to meet the requirements of Article 10 of the Regulations. These noise maps are to be submitted to the Environmental Protection Agency in March 2018 for review.

The EPA, being designated the National Authority for noise mapping and action planning in Ireland, will then deliver these maps to the European Commission in line with Article 10 of the Environmental Noise Directive in January 2019.

5.1.2 Noise Mapping Process

Figure 2 displays the overview of the noise mapping process as presented in the EPA's Guidance Note for Strategic Noise mapping¹. There are three main phases to the process:

Phase 1: Preparation of datasets in the GIS Environment;

Phase 2: Noise calculations; and

Phase 3: Post Processing and Analysis.

¹ EPA Guidance Note for Strategic Noise Mapping (Version 2)

Phase 1 was conducted separately for national and non-national roads while Phase 2 and Phase 3 merged datasets from national and non-national roads to form one complete model. Population exposure assessments were then performed on a County by County basis.

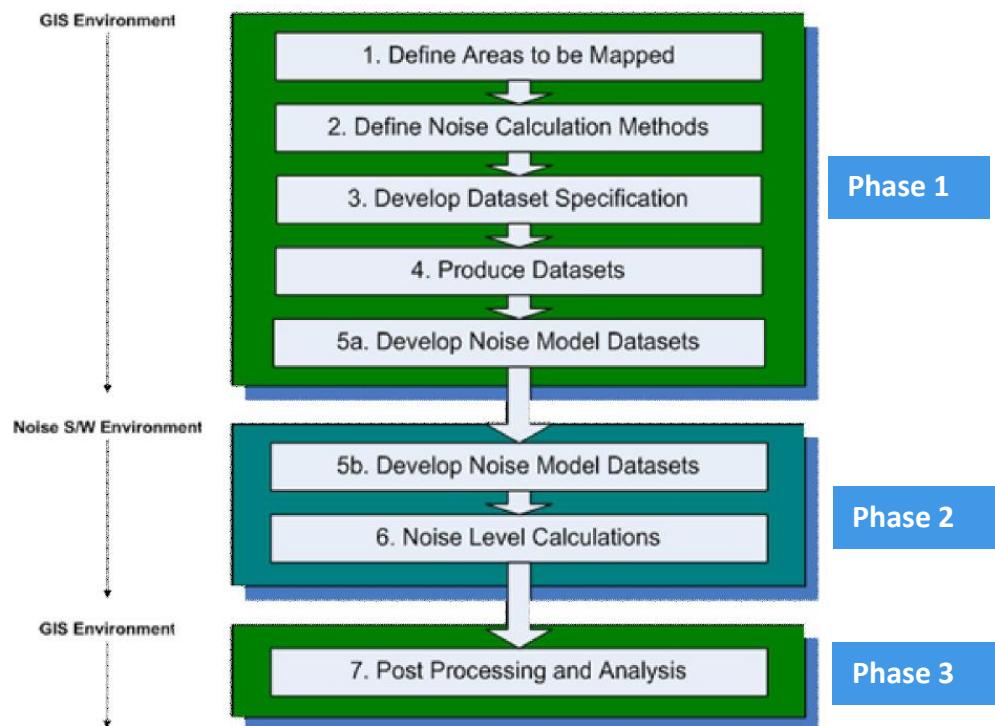


Figure 2: Overview of the noise mapping process

5.1.3 Calculation Methodology

The second schedule of the Environmental Noise Regulations sets out the recommended interim computation methods which may be used for the assessment of noise. The methods are referred to as interim methods as they are to be used until such time as a common method of noise assessment is adopted across Europe. The recommended interim methods of assessment set out in the second schedule of the Regulations contain the four EC Recommended Interim Methods set out in Annex II of the Directive. The Directive also provides for Member States to use either the EC Recommended Interim Methods or methods based upon those laid down in their own legislation. As it is common practise for environmental impact assessments to be undertaken in Ireland for roads and railways using the UK national calculation methods, the second schedule of the Regulations also sets out the UK method for the Calculation of Road Traffic Noise (CRTN). The relevant publications

describing the CRTN and its application are listed in Appendix B. The CRTN method was used for all noise mapping calculations.

5.1.4 Data Sources

In order to develop strategic noise maps the following data sources were utilised.

NRA/TII Traffic Model

The NRA/TII maintains a National Transport Model to support transport investment decisions, and facilitate good forecasts of traffic volumes on the road network for different future years, and economic conditions. The National Transport Model provides a comprehensive representation of base demand on the transport network, in addition to a series of future year transport forecasts. The Traffic Model was used to determine traffic quantities and composition.

Aerial LiDAR

In 2009, the NRA published a notice for tender for an aerial LiDAR survey of approximately 3,019km of the Irish national road network. The survey corridor was 1,200m in width. The survey was completed in early 2011 and outputs included 1 metre contours for the entire survey area, building height information for buildings within the survey corridor and a digital terrain model.

GeoDirectory

The GeoDirectory data products are developed by OSi and An Post to provide a single point location object for each building in Ireland. The GeoDirectory dataset provides the definitive address database for the country and is an essential component in calculating the population exposed to the various noise bands, information that is required to be submitted to the EU as part of this work.

Corine Database

The European Environment Agency's (EEA) CORINE Land Cover 2000 dataset is a European-wide vector land parcel product derived from satellite imagery R2V processing. The CORINE dataset was developed in the framework of the CORINE programme to establish a computerised inventory on land cover. The dataset was used for making environmental policy as well as for others such as regional development and agriculture policies. For noise calculation, the dataset can be used to provide information on the land cover distribution.

Ordnance Survey of Ireland (OSI)

OSI maintain a wide range of mapping products that are available for use within strategic noise mapping. Some datasets included for analysis are the OSI Large Scale vector mapping, at various scales, high resolution photography and numerous OSi boundary datasets.

Central Statistics Office (CSO)

The CSO publish statistical information on population based upon Census returns. The most recent Census was held on 24 April 2016, and some of this information is now publically available. The information available on population is issued according to various political boundaries, namely Province or County, Province County or City, Regional Authority, Constituency or Electoral Division.

Roads Database

The NRA/TII's Roads Database is a GIS repository that contains much of the data required to successfully undertake this noise modelling project. The Roads Database contains information on carriageway types, road widths, noise barriers, surface types, texture depths and speed limits. These datasets where relevant were used in developing noise models along with any supplementary data available.

As-Built Drawings

When new roads or road upgrades are complete the Contractor is required to submit as-built documentation including as-built drawings to the NRA/TII. These drawings indicate the position, type and height of noise barriers along the road scheme.

5.1.5 Population Exposure Methodology

Under the terms of the Directive, the number of people and dwellings exposed to environmental noise must be calculated and presented in terms of the estimated population exposed per 5dB noise band. These figures are derived using a combination of the datasets listed above along with results of the strategic noise mapping process. The Census Small Area Population Statistics from the Central Statistics Office and the Geodirectory listings were used to create a layer of Electoral Districts (ED) that have an average population per household (residential points in the Geodirectory) figure for each District.

Population exposure in each noise contour band was generated by cross referencing the occupied residential Geodirectory locations in each noise contour band with localised

population data to create a set of population figures in each area, which were then assigned a decibel level score depending on which noise contour band the dwelling was located within and the maximum façade exposure level indicated by noise mapping results.

5.2 Presentation of results

5.2.1 Noise Contour Maps for County Meath

The strategic noise maps for major noise sources located in County Meath are presented in Appendix C. These maps are plotted in terms of L_{DEN} and L_{NIGHT} and are displayed in 5dB(A) bands.

5.2.2 Summary of exposure statistics for County Meath

The total numbers of people exposed to road traffic noise from major sources was estimated as described in section 5.1.5. Table summarises the total number of people, within the confines of the strategic noise mapping area, estimated to be exposed to environmental noise from major sources, listed per 5dB(A) noise band.

L_{DEN}			L_{NIGHT}		
Noise Band	Population 2013	Population 2018	Noise Band	Population 2013	Population 2018
55-59	5716	3965	50-54	2970	3589
60-64	2362	3504	55-59	1098	2099
65-69	908	1721	60-64	162	550
70-74	131	467	65-69	3	34
>=75	3	22	>=70	0	0
Total	9,120	9,679		4,233	6,272

Table7: Estimated Population exposure per 5dB(A) noise contour band

The figures in 7 indicate that approximately 5% of the population of County Meath are estimated to be exposed to levels of greater than 55dB(A) L_{DEN} and less than 3% to levels of greater than 50dB(A) L_{NIGHT} .

L_{DEN}			L_{NIGHT}		
Noise Band	Dwellings 2013	Dwellings 2018	Noise Band	Dwellings 2013	Dwellings 2018
55 - 64	2504	3806	50 - 60	1226	2494
65 - 74	241	939	60 - 70	35	239
> 75	1	8	> 70	0	0

Table 8: Approximate number of dwellings per noise cut-off limit

The figures in Table 8 shows the approximate number of dwellings contained per noise band.

5.3 Limitations of the maps and results

Strategic noise maps are based on averaged data sets that best describe the defining parameters of the noise emission and propagation model. While these predictive models are extremely complex, they only provide estimates of the likely noise levels resulting from these predetermined conditions. It is possible that, in some cases, factors outside the scope of the predictive model could influence the levels of environmental noise. It is important to note that noise maps are strategic in nature, indicating areas which may have undesirably high sound levels or preferably low levels. Local noise abatement measures may influence the actual situation and on site surveys may be necessary to determine the actual noise situation.

The results of the noise mapping process display environmental noise levels attributed only to a single source i.e. traffic noise. While this is by far the most predominant source of environmental noise, the maps may not always be fully representative of the noise situation. Additionally, only roads with greater than 3 million annual vehicle passages are considered.

In relation to the assessment of quiet areas in open country the maps become unsuitable. By definition these areas are undisturbed by noise from traffic, industry or recreational activity. As such, they will not be located in the vicinity of major roadways and will lie outside even the lowest contour bands of the strategic noise maps.

In addition, the identification of quiet areas within a built up environment becomes difficult when the mapping results for the area are attributed to a single major road passing through the development. Areas identified by the noise maps as having desirably low noise exposure levels may be subject to traffic noise from smaller roads within the area that do not qualify as major roads. These areas may in fact experience levels of environmental noise that are higher than indicated due to traffic flows that are outside the scope of the mapping process.

6 Identification of Areas Subject to Noise Management

Strategic noise maps provide an indication of the extent of environmental noise exposure within a given area. However, not all areas which appear subject to high levels of noise exposure require priority action. Various factors must be taken into account when deciding if environmental noise management is necessary, such as, the type of buildings and land use in the area, the source of the noise and, of course, the level of noise predicted. For the purpose of identifying problem areas for action planning, it is proposed to use a 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. An example of this decision support matrix is given in Appendix D.

A total score of approximately 17 or above in this matrix indicates that the location in question should be included in a shortlist for further assessment. When combined with the guideline values for the onset of noise assessment presented in section 2.4 the support matrix allows for a more comprehensive evaluation of the impact of environmental noise pollution at a given location.

6.1 Confirmation of Onset of Assessment Thresholds

The guideline values presented in section 2.4 are provided for use as a preliminary indicator of the need for more detailed noise assessment. While these values do not necessarily indicate that environmental noise quality is particularly poor, they do provide a reasonable starting point for the process of assessment and confirmation of noise exposure in a more focused manner. The estimated population exposure figures indicate that 8 residences may be subject to noise exposure levels of greater than 75dB(A) L_{DEN} . The night time figures indicate that approximately 239 residences may experience levels of greater than 60dB(A) L_{NIGHT} . The predicted exposure levels at these locations give rise to the need for further detailed noise assessment.

6.2 Confirmation of Protection Thresholds for Quiet Areas

Under the Environmental Noise Regulations it is required to delimit quiet areas within agglomerations. As there are no qualifying agglomerations within County Meath, there is no statutory requirement to identify quiet areas within Meath.

There are areas in County Meath within the coverage of the strategic noise maps where low levels of environmental noise may be seen to be desirable and of public amenity. The procedure outlined for delineating quiet areas requires the preservation of existing noise levels where they are deemed to be good. As such, it is proposed to consider using the criteria defined in section 2.4 to define areas close to major noise sources where low levels of environmental noise should be preserved.

The strategic noise maps generated by the NRA/TII included several areas, close to major roads, where the predicted environmental noise levels are potentially below the recommended quiet threshold of 57dB L_{DEN} and 45dB L_{NIGHT} . However, it is important to point out that the predicted noise levels are those attributable only to the major road. All of these areas are covered by networks of regional roads connecting to the major primary routes. Traffic on regional roads will have an influence on the noise levels in these areas and the actual levels of environmental noise at these locations is unlikely to be as low as those indicated by the strategic noise maps. Nonetheless, thought should be given to the protection of these areas as they can be seen as being “relatively quiet” with respect to noise emissions from the major roads.

During the implementation of the Noise Action Plan it is proposed to identify locations within the coverage of the strategic noise maps where, if appropriate, the existing noise levels should be preserved. These areas are to offer public amenity and include public open spaces and areas of natural beauty.

6.3 Quite Areas in Open Country

The Environmental Noise Regulations define a quiet 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.”

County Meath is a region of extensive natural beauty. The rural landscape contains several areas of environmental and historical significance including a World Heritage site at Brú na Bóinne.

The Assessment Study outlines several policies and recommendations relating to the protection of the landscape and the natural environment. These policies are general in nature and provide a best practice approach. The aim of both policies and recommendations is to enhance and maintain landscape character within the broader goal of accommodating development in a sustainable manner. This approach ensures that future development is complementary to landscape character.

Areas of natural beauty and visual amenity are enhanced by the sense of tranquillity experienced when there is a lack of noise related to human activity. What constitutes a tranquil area is often a matter of perception. The acoustic amenity of quiet areas and open spaces in the countryside can be as dependent on qualitative factors as on absolute levels of noise. By definition these areas will be outside the coverage of strategic noise maps.

In order to advance the knowledge base in this area, the EPA commissioned a report, “Noise in Quiet Areas,” to evaluate the baseline noise levels and acoustic quality of rural areas in Ireland. This research is an appropriate starting point for defining and designating Quiet Areas in County Meath.

During the implementation of the Noise Action Plan a review may be undertaken of the Landscape Character Assessment Study with a view to identifying areas which could be evaluated under the criteria set out in the EPA report. Potential Quiet Areas will also be assessed in terms of projections for future planning demands and regional development. A consultation process will then be undertaken on any appropriate potential Quiet Areas prior to submission for approval by the Minister.

6.4 Application of the Criteria and Decision Matrix

The noise impact assessment method outlined in section 0 was applied to all noise sensitive locations within the assessment areas of the strategic noise maps in order to calculate a priority rating. The indicated level of L_{DEN} and L_{NIGHT} , combined with the result of the decision matrix was used to determine whether or not more detailed noise exposure evaluation is warranted.

6.5 Results of the Analysis

Tabulated results of the outcome of the decision matrix application process are shown below. The tables show the score achieved using the matrix, whether the limit values in section 2.4 were surpassed and if the value exceeded the upper limit (L) or lower limit (Q). Completed matrices are presented in Appendix E.

Julianstown			
Name	Limit Exceedance	Loud or Quiet	Matrix Score
Whitecross National School	N	-	17
Moorehall Nursing Home	Y	Q	18

Table 9: Results of decision support process – Julianstown

Navan			
Name	Limit Exceedance	Loud or Quiet	Matrix Score
County Meath VEC	Y	Q	21
Flowerfield National School	Y	Q	21
Navan Education Centre	N	-	16
Schoil Mhuire	Y	Q	21
St Anne's Loreto Primary School	Y	Q	21
St Joseph's Mercy Primary School	Y	Q	21

St. Michael's Loreto Secondary School	N	-	16
St. Oliver Plunkett National School	Y	Q	21
St. Patrick's Classical School	Y	Q	21
St. Paul's National School	Y	Q	21
St. Ultan's School	Y	Q	21

Table 10: Results of decision support process – Navan

Ratoath			
Name	Limit Exceedance	Loud or Quiet	Matrix Score
Ratoath Junior School	N	-	16

Table 11: Results of decision support process – Ratoath

Slane			
Name	Limit Exceedance	Loud or Quiet	Matrix Score
St. Patrick's National School	N	-	19

Table 12: Results of decision support process – Slane

6.5.1 Threshold Exceedance – Loud

There are residences on the major roads which are estimated to be exposed to environmental noise levels of over 70dB(A) L_{DEN} and 57dB(A) L_{NIGHT} . There are no noise

sensitive locations which exceed the higher thresholds and have a matrix score of 17 or more.

6.5.2 Threshold Exceedance – Quiet

All noise sensitive areas in which environmental noise levels are below the lower limit values have matrix scores of over 17 and therefore should be considered for detailed noise evaluation and prioritised for possible protection. Again, it is important to remember that the environmental noise levels on the strategic maps are only in relation to traffic noise from the major sources and do not include the influences of any other regional roads. Actual levels are likely to be higher than those indicated in the strategic noise maps.

7 Mitigation and Protection Measures

Meath County Council 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.

It is proposed to achieve this by adopting a strategic approach to managing environmental noise through practices which promote:

- Noise reduction at source
- Incorporation of noise targets into the planning process, and
- Detailed consideration of noise impact.

7.1 Processing Areas above Onset of Assessment Criteria

It is proposed that areas indicated to be subject to environmental noise levels above the assessment threshold will be processed on a prioritised basis. Consideration will be given to land use and building type, the estimated number of people exposed and the levels of exposure. The extent of environmental noise exposure at these locations will be evaluated by field surveys. Where noise levels are confirmed to be unacceptably high the Council will implement appropriate measures to reduce the effects of noise exposure on a prioritised basis. Predictions for the future environmental noise situation of these areas must be taken into consideration when deciding on long term strategy.

7.2 Preservation of Areas Below the Protection Threshold

Areas of favorably low environmental noise exposure will be examined if affected by any activity which could impact on the acoustic environment. By considering the noise impact of any future development at the early stages of the planning process it will be possible to minimize any adverse effects on the local soundscape and thereby provide protection for relatively quiet areas. The consideration of noise in the planning process is reflected in the County Meath Development Plan.

7.3 Management of Areas Between the Thresholds

Careful consideration of environmental noise pollution when planning for sustainable development will be a key factor in the ongoing management of the acoustic environment. Incorporation of environmental noise strategies into the planning and zoning processes will aid in the controlling of noise exposure during the ongoing development of industrial, social and residential facilities. The Council will aim to achieve continued improvement of policies and practice which promote favourable noise levels.

7.4 Confirming the Extent of Noise Impact

Locations which have been identified as potential hotspots by strategic noise mapping and the decision support matrix will be subject to more detailed noise investigation. These locations will be processed on a prioritised basis. The results of the strategic noise mapping process will first be confirmed by means of field surveys. Validation and confirmation of the strategic noise mapping results will provide an indication of the extent of environmental noise impact and the need for possible mitigation actions. Where noise levels are confirmed to be above acceptable threshold values, appropriate measures will be taken to reduce the effects of noise exposure on a prioritised basis.

7.4.1 Prioritisation of Noise Mitigation Measures

The aim of the Environmental Noise Regulations and this Action Plan is to avoid, prevent or reduce the harmful effects of exposure to environmental noise pollution. This will be done most effectively by concentrating efforts where they will be of greatest benefit. Prioritisation of locations for noise reduction measures will take account of both the number of people likely to benefit from proposed actions and the potential noise reduction achievable. These factors will be assessed on an ongoing basis, taking account of the effects of planned future developments and any resulting material changes in the local noise situation. The selection of locations will also be supported by field surveys to assess actual noise levels. Selection of the most appropriate noise mitigation measures will also be influenced by a number of controlling issues. These include available budgets, potential noise reduction, suitability of measures and associated drawbacks such as visual impacts.

An overview of the decision making process is given in Appendix D.

7.5 Review of Possible Mitigation Measures

An effective overall environmental noise management plan will include several measures combined into a consolidated approach. The most effective measures which can be implemented by Local Authorities are those at the planning level, such as:

- Traffic avoidance plans that combine walking, cycling and public transport,
- Speed reduction plans involving partial access zones,
- Traffic flow control, through diversion or smoothing,
- Reduction of speed limits,
- Mitigation of environmental noise hotspots by through traffic management,
- Road surface improvements and road maintenance,
- Specification of façade insulation requirements for planning permission,
- Promotion of electric vehicles through measures such as; installing infrastructure, reduced parking costs and designated parking and driving zones.

At national level, noise exposure could be tackled by the introduction of more focused planning guidance or noise regulations. Environmental noise limit values could also be set for planned developments. At EU level the reduction of noise at source is controlled by limiting permissible tyre noise and vehicle noise emission levels, this is an ongoing policy of the European Commission. Additional noise control measures can be implemented on an acoustic basis and include noise screening and façade insulation.

7.6 Assessing Reduction Effects of Potential Measures

There are a number of recommended methods for assessing the effectiveness of noise management schemes, which include both monetary and personal metrics. A position paper published by the EU Working Group on Health and Socio-Economic Aspects recommended a figure of €25 per household per decibel per year. The value was based on a study conducted throughout several European cities and is a suggested value to be used by EU member states in the absence of more localised figures. This is the most suitable figure available for evaluating monetary benefits of noise mitigation measures.

Noise reduction can also be assessed in personal and health terms. The EU Working Group on Noise Annoyance have suggested simple mathematical relationships for calculation of the percentage of people annoyed (%A) due to road traffic noise (see Appendix A). Using these expressions and the calculated values of L_{DEN} and L_{NIGHT} , the benefits of any noise reduction measures can be estimated.

These methods will be used to assess the suitability of any proposed measures in order to determine the likely benefit for the local population and also to perform cost-benefit analysis studies on planned projects.

7.7 Proposed Approach to Noise Mitigation

The Council will endeavour to manage exposure to environmental noise where necessary, using the most appropriate measures. These measures will aim to prevent, reduce or relocate noise in order to minimise the number of people affected by traffic noise emissions. The actions taken will be strategic in nature and represent a best practice approach to environmental noise mitigation and the limitation of exposure to environmental noise.

The Council will manage environmental noise in built up areas, where necessary, on a prioritised basis by:

- Traffic management
- Implementing traffic calming measures
- Designating 30km/hr zones in residential areas
- Encouraging more environmentally friendly forms of transport such as cycling or walking
- Encouraging the use of public transport
- Promoting the use of electric vehicles in both public and private fleets

The Council will consider using the Planning Process, where necessary:

- To continue to integrate the recommendations of Noise Action Plans into future Development Plans
- To integrate environmental noise planning guidelines into planning processes to ensure that new developments give cognisance to environmental noise exposure and noise mitigation
- To continue to incorporate any suitable national guidance on the treatment of environmental noise into local policy
- To ensure that future developments are designed and constructed in such a way as to minimise noise disturbances due to environmental noise.

These measures will be supported by consideration of environmental noise exposure when planned developments are likely to:

Introduce People to Noise

- Where the locations of new housing, schools, hospitals or other noise sensitive locations are in the vicinity of major sources of environmental noise.

Introduce Noise to People

- Where a new or altered road or other major source of environmental noise would have a notable effect on the existing noise environment in the local area.

The Council will continue to have regard to protect the future environmental noise climate by early incorporation of noise action planning into the planning and operational stages of future developments.

8 Public Participation

The Draft Noise Action Plan will be displayed at suitable locations in County Meath and submissions from the public will be invited. Information regarding the public participation process will be advertised online and in local newspapers.

All responses will be reviewed by Meath County Council and the Noise Action Plan will be amended where appropriate.

9 Implementation

It is the goal of the Council 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 Council will aim to promote a high level of protection and environmental health.

9.1 Program of Works

The Noise Action Plan covers a 5 year period, beginning in 2018. The following works are proposed within this time frame.

Year 1

- Review strategic noise maps to identify where priority action is required
- Confirm the extent of impact at appropriate locations
- Draw up shortlist of areas and noise sensitive locations for noise mitigation review
- Submit suitable candidate locations for Quiet Area status to the Minister for approval, after consultation with appropriate stakeholders

Year 2

- Identify, at local level, priority areas for possible noise assessment and prioritised mitigation action, as predicted by strategic noise maps and decision support criteria
- Carry out cost benefit analyses for possible measures
- Evaluate the actual environmental noise levels at sensitive locations on a priority basis
- Recommend mitigation or protection actions at suitable locations, where necessary

Year 3

- Set out data requirements for 2022 round of strategic noise mapping
- Commence implementation of approved measures based on recommendations

Year 4

- Collate data required for 2022 round of noise mapping and deliver to appropriate noise mapping authority
- Continue with implementation of approved noise management actions
- Evaluate effectiveness of any measures which have been implemented

Year 5

- Review the impact of the Noise Action Plan and amend where appropriate
- Public consultation and publication of 2018 to 2023 Noise Action Plan
- Review of all progress against 2018 case

9.2 Evaluation, Review and Corrective Action Programmes

The Council will review the effectiveness of noise action planning activities on an ongoing basis. 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. Additionally, in 2023 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. The results of the most recent round of strategic noise mapping will also be used during the review process in order to compare overall levels of environmental noise exposure to the current, 2018 scenario.

9.3 Compliance with Requirements of Environmental and Planning Legislation and Planning and Licensing Processes

All proposals for development/works under the Action Plan will be required to demonstrate compliance with the requirements of environmental and planning legislation and planning and licensing processes, including existing provisions of relevant land use plan(s) and policy documents such as the National Planning Framework, the Regional Spatial and Economic Strategy for the Eastern and Midlands Region, the Meath County Development Plan 2013-2019 and Local Area Plans in force in the County.

Appendix A - Glossary of Terms

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
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
END	Environmental Noise Directive (2002/49/EC)
ESRI	Environmental Systems Research Institute
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
Noise Bands	Areas lying between contours of the particular noise levels (dB)
Noise Levels	Free-field values of L_{den} , L_{day} , $L_{evening}$, L_{night} , and $LA10,18h$ at a height of 4m above local ground level
L_{DAY}	Daytime noise level = $L_{Aeq}\ 12h$ (07:00 to 19:00)
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
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

Formulae:

L_{DEN} is calculated from:

$$L_{den} = 10 \log_{10} \frac{1}{24} \left(12 * 10^{\frac{L_{day}}{10}} + 4 * 10^{\frac{Levening+5}{10}} + 8 * 10^{\frac{L_{night+10}}{10}} \right) dB$$

Percentage of people annoyed and highly annoyed are calculated from:

$$\%A = 1.795 * 10^{-4} (L_{den} - 37)^3 + 2.11 * 10^{-2} (L_{den} - 37)^2 + 0.5353 (L_{den} - 37)$$

Percentage of people sleep disturbed is calculated from:

$$\%SD = 13.8 - 0.85 * L_{NIGHT} + 0.0167 * (L_{NIGHT})^2$$

Appendix B - References

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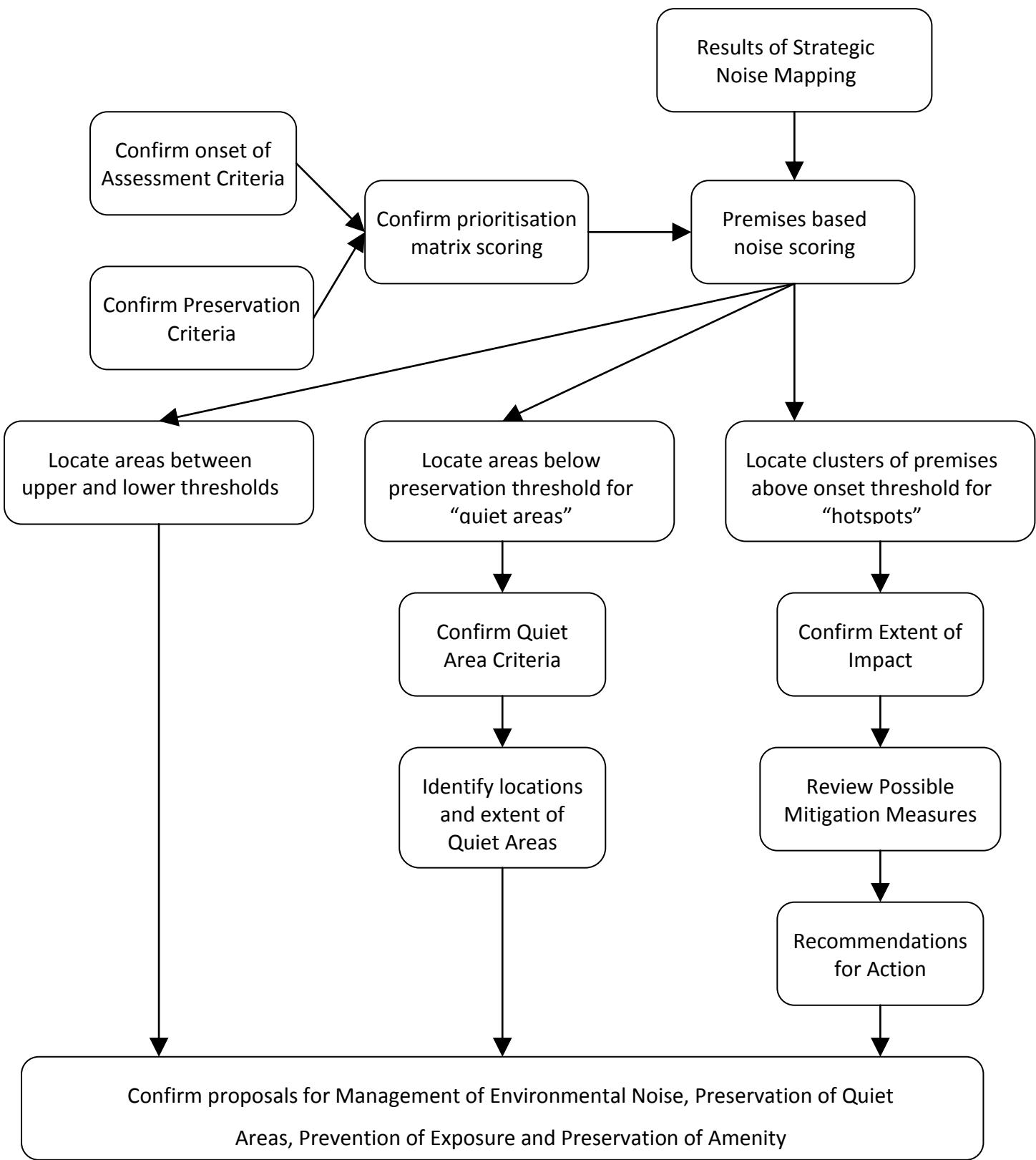
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Appendix C - Strategic Noise Maps

Appendix D - Approach to Decision Making Process for Determining Actions to Be Undertaken



Appendix E - Decision Support Matrices

		Priority Matrix		
		Location: Example		
Decision Selection Criteria		Score Range L_{DEN}	Score range L_{NIGHT}	Subtotal
Noise Band	<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	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				

Noise Sensitive Locations in Julianstown

		Priority Matrix		
		Location: Whitecross National School		
Decision Selection Criteria		Score Range	Score range	Subtotal
Noise Band	<45	5	6	
	45-49	4	5	
	50-54	3	4	4
	55-59	2	2	
	60-64	1	3	
	65-69	2	4	2
	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	3	3	
	School	3	1	4
	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	7
Total Score				17

		Priority Matrix		
		Location: Moorehall Nursing Home		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	5
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	1
	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	5
	Noise Sensitive	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	7
Total Score				18

Noise Sensitive Locations in Navan

		Priority Matrix		
		Location: County Meath V.E.C.		
Decision Selection Criteria		Score Range	Score range	Subtotal
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: Flowerfield National School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: Navan Education Centre		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	2
	60-64	1	3	1
	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	3	3	6
	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	7
Total Score				16

		Priority Matrix		
		Location: Scoil Mhuire		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Anne's Loreto Primary School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Joseph's Mercy Primary School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Michael's Loreto Secondary School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	
	45-49	4	5	
	50-54	3	4	4
	55-59	2	2	
	60-64	1	3	1
	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	3	3	
	School	3	1	4
	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	7
Total Score				16

		Priority Matrix		
		Location: St. Oliver Plunkett National School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Patrick's Classical School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Paul's National School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

		Priority Matrix		
		Location: St. Ultan's School		
Decision Selection Criteria		Score Range	Score range	
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

Noise Sensitive Locations in Ratoath

		Priority Matrix		
		Location: Ratoath Junior School		
Decision Selection Criteria		Score Range	Score range	Subtotal
Noise Band	<45	5	6	6
	45-49	4	5	4
	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	3	3	
	School	3	1	4
	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	7
Total Score				21

Noise Sensitive Locations in Slane

		Priority Matrix		
		Location: St. Patrick's National School		
Decision Selection Criteria		Score Range	Score range	Subtotal
Noise Band	<45	5	6	
	45-49	4	5	5
	50-54	3	4	3
	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	3	3	
	School	3	1	4
	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	7
Total Score				19

Appendix F - Details of Public Participation

The Draft Noise Action Plan will be displayed at suitable locations in County Meath and submissions from the public will be invited. Information regarding the public participation process will be advertised online and in local newspapers.

Details of submissions received will be presented here.