

# The Councils of the County and City of Kilkenny



## Draft Noise Action Plan 2008

Consultation Issue Aug 09

**KILKENNY COUNTY COUNCIL  
COUNTY HALL  
JOHN STREET KILKENNY**

**KILKENNY BOROUGH COUNCIL  
CITY HALL  
HIGH STREET KILKENNY**

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## EXECUTIVE SUMMARY

The Environmental Noise Directive (END), issued by the European Community relates to the assessment and management of environmental noise and was adopted in 2004. Statutory Instrument No. 140 of 2006, also known as the Environmental Noise Regulations 2006, was brought into effect by the Minister for the Environment, Heritage and Local Government and gives effect to European Council Directive 2002/49/EC.

The aims and objectives of the Directive state that the adoption of action plans should be concerned with:

*“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” (END Article 1)*

The Regulations set out to:

*“Provide an 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.” - Article 4(1)*

This document has been prepared in accordance with the requirements of SI 140 of 2006 and sets out the Draft Noise Action Plan for the Councils of the County and City of Kilkenny.

# **1 Introduction**

## **1.1 Purpose and Scope of the Environmental Noise Directive (END)**

The Environmental Noise Directive (END) was issued by the European Community and relates to the assessment and management of environmental noise. This Directive (2002/49/EC) was subsequently adopted in 2004.

### **1.1.1 The Aim of the Directive is:**

*“to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise”*

The objective of the Directive is to establish an EU wide approach to avoid prevent or reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health, and to preserve existing good quality environmental noise levels.

The Directive requires that Member States develop strategic noise maps identifying the environmental noise distribution for that State arising from the primary sources of noise such as major roads, railways airports, major industrial sites and all sources within population agglomerations in excess of 250,000 persons in 2007, and those with a population in excess of 100,000 in 2012 and subsequent rounds. Exclusions to types of noise referred to in the directive include noise caused by the exposed person, noise from domestic activities, noise generated by neighbours, noise at workplaces or noise inside a means of transport or due to military activities.

The primary requirements of the Directive are as follows:

- Undertake strategic noise mapping to determine exposure to environmental noise.
- Ensure information on environmental noise and its effects are made available to the public.
- Adopt action plans, based upon the noise-mapping results, with the objective of reducing preventing and reducing environmental noise where necessary and to preserving environmental noise quality where it is good.

## **1.2 Purpose and Scope of the Regulations**

Statutory Instrument No. 140 of 2006, also known as the Environmental Noise Regulations 2006, was brought into effect by the Minister for the Environment, Heritage and Local Government and gives effect to European Council Directive 2002/49/EC.

The Regulations set out to:

*“Provide an 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.” - Article 4(1)*

The Regulations are to apply to environmental noise to which people 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, near hospitals, and near other noise sensitive buildings and areas. – Article 4(2)

In the context of the Regulations, environmental noise is defined as unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity. – Article 3(1)

The Regulations shall not apply to noise caused by an exposed person, noise from domestic activities, noise created by neighbours, noise at work places, noise inside means of transport, or noise due to military activities in military areas. – Article 4(3)

### **1.3 Roles and Responsibilities of Designated Bodies**

The Regulations identify and assign responsibilities to the particular organisations required to produce strategic noise mapping, and to those organisations responsible for the development of action plans. The Environmental Protection Agency has been designated under the Regulations as the National Authority responsible for the overseeing and implementation of the Regulations. In December 2007 the EPA presented information to the European Commission in relation to population exposure to environmental noise within the State. In Jan 2009 the EPA is required to submit summaries of the Action Plans prepared by the Local Authorities. A further submission in relation to Action Plans is required in 2013 and every five years thereafter, or as the need arises

following a major development impacting on the existing environmental noise conditions.

The EPA is also required to provide advice and guidance to the relevant Noise Mapping Bodies and Action Planning Authorities.

### **1.3.1 Noise Mapping Bodies**

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

- For major national roads, the National Roads Authority (NRA) is the noise mapping authority on behalf of the action planning authority
- For major non- national roads, the relevant local authority is the noise mapping authority concerned
- For major railways, Iarnród Éireann or the Railway Procurement Agency, as appropriate is the noise mapping authority on behalf of the action planning authority
- For major airports, the relevant airport authority is the noise mapping authority on behalf of the action planning authority
- For the agglomeration of Dublin, the four Dublin local authorities are the noise mapping authorities
- For the agglomeration of Cork, Cork City and Cork County Councils are the noise mapping authorities

The relevant noise mapping bodies were required to produce strategic noise maps for the main sources of environmental noise by June 2007, in respect of the calendar year 2006, for:

- Any agglomeration with a population greater than 250,000
- Any major road with more than 6 million vehicle passages per year
- Any major railway with more than 60,000 train passages per year
- Any major airport

In respect of the second and subsequent rounds of action plans the Regulations state that the designated noise mapping bodies are required to make strategic noise maps or revised maps, as appropriate, for:

- Any agglomeration with a population greater than 100,000
- Any major road with more than 3 million vehicle passages per year
- Any major railway with more than 30,000 train passages per year
- Any major airport

### **1.3.2 Action Planning Authorities**

Action Planning Authorities are responsible for making Action Plans following consultation with the EPA and the relevant noise mapping bodies. Action Plans must satisfy the minimum requirements as set out in the Fourth Schedule of the Regulations.

The Action Planning Authorities are the Local Authorities within whose functional area the major population agglomerations and major road, rail and airport networks are located, and under the Regulations are designated as follows:

- For major roads, the local authority or local authorities within whose functional area or areas the road is located.
- For major railways, the local authority or local authorities within whose functional area or areas the railway is located.
- For major airports, the local authority or local authorities within whose functional area or areas the airport is located.
- For the agglomeration of Cork, Cork City and Cork County Councils.
- For the agglomeration of Dublin, the four Dublin local authorities.

Action Planning Authorities must produce Action Plans for the first round during 2008, for the second round in 2013 and every five years thereafter. Action Plans must be produced based on the results of the noise mapping. It is also required to review and revise the noise maps if necessary from time to time and whenever a major development occurs affecting the existing noise situation.

The Regulations require the Action Planning Authorities to consult the public when drawing up and revising Action Plans. – Article 11(6)

### **1.4 Key Phases**

The Directive and Regulations set out the requirements for the management of environmental noise, comprising the identification of Areas required to be noise mapped, the preparation of Strategic Noise Maps, and the development and subsequent implementation of Noise Action Plans.

### **1.4.1 Identification of Areas required to be mapped**

The Action Plan must refer to places near the major roads, major railways and major airports, and within any relevant agglomeration, – Article 11(1) (a) to (d), which means those places affected by noise from the major sources, as shown by the results of the noise mapping, and all locations within any relevant agglomeration. The EPA advise that noise from major sources is regarded as affecting an area if it causes either an  $L_{den}$  value of 55dB(A) or greater or an  $L_{night}$  of 50dB(A) or greater anywhere within an area.(Ref. EPA Draft Guidance Notes)

In the case of the Councils of the County and City of Kilkenny the following areas are within the subject criteria of the Regulations:

Sections of the N9 in the Environs of Waterford City

Sections of the N10 in the Environs of Kilkenny City

Sections of the N25 in the Environs of Waterford City and New Ross

Sections of the N77 in the Environs of Kilkenny City

The major noise source meeting the criteria set out in the Regulations are those associated with roads with more than 6 million vehicle passages per year. Areas which were required to be mapped are in the vicinity of these roads.

### **1.4.2 Preparation of Strategic Noise Maps**

Article 6 of Statutory Instrument No. 140 of 2006 outlines the relevant noise mapping bodies and for major roads these are:-

- (i) Where such roads are classified as national roads in accordance with Section 10 of the Roads Act 1993 (No. 14 of 1993), the National Roads Authority, on behalf of the action planning authority or authorities concerned, and
- (ii) Other than those provided for in sub-paragraph (i), the relevant road authority or authorities, as appropriate.

Strategic noise mapping was undertaken during 2007 by the National Roads Authority in respect of the designated roads in County Kilkenny. Data from the National Roads Authority traffic counting system was used to identify those roads which met the 6 million vehicle passages per year criterion.

Noise mapping uses software that estimates the noise level in an area from a particular noise source. The objective is to identify locations where action may be needed to reduce high noise levels and to protect areas where the noise levels are low.

The strategic noise maps generated by the National Roads Authority give predictions for two noise indicators,  $L_{den}$  and  $L_{night}$ . The  $L_{den}$  maps are presented in 5dB contour bands beginning at 55dB  $L_{den}$  and ranging up to 75dB  $L_{den}$ . These maps also give an indication of noise levels that are predicted greater than 75dB  $L_{den}$ .  $L_{night}$  maps range from 50dB to 70dB  $L_{night}$ . The noise levels indicated are attributed only to the specific source of noise being considered, namely the traffic on the roadway and therefore do not consider any other noise source.

### **1.4.3 Development of the Noise Action Plans**

Within the framework of the END and the context of sustainable development, the overall aim of managing environmental noise is to avoid, prevent and reduce the harmful effects due to long term exposure to environmental noise, which would in turn promote good health and a good quality of life.

The emphasis of the END and the Regulations is on “important” areas as established by the strategic maps. The Action Plan is therefore designed with the twin aims of;

- Avoiding significant adverse health impacts from noise and
- Preserving environmental noise quality where it is good.

The Regulations require the Action Planning Authority to consult the public when drawing up and revising Action Plans – Article 11(6). To comply with this requirement a formal public consultation exercise on the Draft Action Plan will be undertaken. The public consultation process will have regard to the Department of the Taoiseach publication *Reaching Out – Guidelines on Consultation for Public Sector Bodies, 2005*.

Relevant bodies will also be proactively consulted in parallel to the wider public consultation.

The methodology for the public participation will ensure that the public is consulted about proposals and is given early and effective opportunities to participate in the preparation of the Action Plans. The results of the public participation will be taken into account and the public informed of the decisions taken. Sufficient time will be allowed for each stage of public participation process.

#### **1.4.4 Implementation of the Plans**

Plans are to be implemented within a five year time scale. The Regulations require planning authorities to review (and revise, if necessary) the Noise Action Plan every five years, or sooner where a material change in environmental noise in the area occurs. (Article 11 (7)).

## **2 Existing noise management legislation and guidance.**

### **2.1 National Legislation or Guidance**

#### **2.1.1 Environmental Protection Agency Act 1992**

The existing statutory provisions have come about on foot of the Environmental Protection Agency Act of 1992. Sections 106 to 108 of the Act are of direct relevance, 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.
- Section 107 gives powers to local authorities and the EPA to serve notice to take steps to control noise.
- 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.

### **2.1.2 Building Regulations**

The current Irish Building Regulations call for certain constructions to offer “reasonable resistance” to both airborne and impact sound. Guidance values are put forward in the “Similar Construction” method described in Technical Guidance Document E of the Building Regulations 1997 (S.I. No.497 of 1997).

### **2.1.3 Department of the Environment, Heritage and Local Government**

The 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: Consultation draft guidelines for Planning Authorities, February 2008.
- Urban Design Manual: A best practice guide, 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”*.

The consultation draft 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”* and states that *“Privacy is an important element of residential amenity”*.

The Urban Design Manual lists Privacy and 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 minimise the potential for excessive noise transfer.

### **2.1.4 National Roads Authority**

The National Roads Authority (NRA) has published the document *“Guidelines for the Treatment of Noise and Vibration in National Road Schemes”*, which sets out the procedure to be followed in respect of the planning and design of national

road schemes. These guidelines set out limits for noise related to both the construction and traffic flow on new road schemes.

The NRA Guidelines for the design of new national roads indicates that mitigation measures should be considered above a level of 60dB  $L_{den}$  free-field. The guidelines put forward measures for 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.

### **2.1.5 The Roads Act 1993**

Under Section 77 of the Roads Act 1993, the Minister is empowered to make regulations requiring 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. To date, no such regulations have been enacted.

### **2.1.6 IPPC Licensing**

Certain activities that are required to be licensed may be subject to noise conditions. The relevant guidance is set out in the EPA publication "*Guidance Note for Noise in Relation to Scheduled Activities*". This document contains suggested noise limits of 55dB(A)  $L_{eq}$  for daytime and 45dB(A)  $L_{eq}$ , for night time, with said limits to be applied to sensitive locations and recommends a 'Best Available Technique' (BAT) approach to the assessment and mitigation of noise pollution.

### **2.1.7 Wind Energy Planning Guidelines**

This is a DEHLG document dealing specifically with wind energy developments. Noise levels from wind farms are generally expressed in terms of the  $L_{90}$  indicator. The document suggests a "*lower fixed limit of 45dB(A) or a maximum increase of 5dB(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 43dB(A) at night time is deemed appropriate as there is no requirement to protect external amenity. (DEHLG Wind Energy Guidelines 2006)

## **2.1.8 Quarry and Ancillary Activities**

This publication 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  $L_{aeq}$ , 1hr and 45dB  $L_{aeq}$  15min for daytime and night time respectively, although more onerous values may be 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 125dB ( $L_{in}$ ) max. peak with a 95% confidence limit*”.<sup>1</sup>

The guidance or limits which do exist only cover a restricted number of the possible situations where community or environmental noise is an issue to be addressed. Consequently there are many situations for which there are currently no direct guidelines or legislation. This can lead to inconsistencies in carrying out noise assessments and to existing measures being quoted out of context.

## **2.2 Regional or Local Legislation or Guidance**

### **2.2.1 Kilkenny County Development Plan 2008 – 2014**

National planning policy sets out to promote sustainable development within the county through the integration of transportation and land use policies in order to reduce the need to travel and to promote modal shift away from the private car. The Kilkenny County Development Plan encourages the use of public transport in preference to the private car. In addition, it also seeks to achieve a balance between the use of private transport with the need to promote alternative modes of transport, such as public transport, cycling and walking. The implementation of these measures will result in less traffic and potentially less noise pollution in the County.

Specifically on noise and dust both the Kilkenny County Development Plan has a policy to minimise noise by ensuring that the design of future developments incorporate measures to prevent or mitigate the transmission of dust, noise and vibration, where appropriate.

### **2.2.2 Kilkenny City & Environs Development Plan**

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<sup>1</sup> EPA Environmental Management in Extractive industry 2006

The principal transport aim of the Plan is to develop an efficient, sustainable and integrated multi modal transport system facilitating the movement of people goods and services in the City and Environs.

It is an objective of the Plan to implement the recommendations of the Kilkenny City & Environs' Cycle Routes Study, as part of the transport strategy for the City, and to complete a mobility and traffic management plan dealing with issues such as changes in accessibility arrangements to encourage alternative means of transport to the private car.

### **2.2.3 Local Area Plan**

Local Area Plans prepared for different areas of the County seek to encourage the development of safe and efficient transport networks that will cater for the needs of all users and encourage priority of walking, cycling, public transport and safety.

## **3 Description of the Action Planning Area**

### **3.1 Extent of the Area**

The Action Planning Area is confined to the extent of the County of Kilkenny. Based on the criteria set out in the Regulations, the only noise source requiring assessment relates to noise generated by major roads. The affected areas are located within the Environs of Kilkenny City and Waterford City and the town environs of New Ross. The areas have been taken into consideration by the National Roads Authority in the preparation of strategic noise mapping for those sections of national road infrastructure carrying in excess of 6 million vehicle passages per annum.

### **3.2 General Geographical Description**

The Councils of the County and City of Kilkenny are the designated local authorities for County Kilkenny. The county, which covers an area of 1,963 km<sup>2</sup>, is located in the south east of the Country and borders the Counties of Waterford Tipperary (North & South), Laois, Carlow and Wexford.

### **3.3 Description of the general population**

The 2006 Population Census identified the population for Kilkenny City and Environs as 22,179 and as 87,558 persons for the County. The County has experienced considerable economic growth in recent years and almost all towns within the County have experienced growth in population, with one significant exception being Graiguenamanagh, which recorded a small decline in population between 2002 and 2006. The Census indicates that as the county population increases, a greater percentage of the resulting population is now living within the urban centres of the county. The major focus for expansion in population has been in the Environs of Kilkenny City and the Environs of Waterford City within County Kilkenny. Waterford City is classified as a Gateway City with Kilkenny designated a Hub City. The Environs of New Ross is classified as a Large Town with the following designated as District Towns; Callan, Castlecomer, Graiguenamanagh and Thomastown.

### **3.4 Description of Noise Sensitive Premises**

The Action Planning Authority shall determine the number of noise sensitive premises that lie within the various noise contour bands generated by strategic noise mapping. Housing, hospitals and schools are generally regarded as noise sensitive premises. The APA may further opt to include other premises or specific land types for inclusion as noise sensitive premises depending on local circumstances. These areas could include public open spaces, places of worship, nursing homes, childcare facilities, offices and some livestock farms.

The identification of individual premises shall be carried out during the first phase of the implementation of the Noise Action Plan.

### **3.5 Description of the Main Infrastructure and Services**

The road network comprises 216km of National Roads, 317 km of Regional Roads and 2,536 km of local roads within the County boundary. The County is crossed by four railway lines with a spur from Kilkenny City to connect to the Dublin-Waterford line at Lavistown. Belview Port is serviced by rail which supports the movement of freight. The ports of Waterford/Belview and New Ross service the county and the South-East region.

## **4 Responsible Authority for Action Planning**

In County Kilkenny, the only noise source to be considered by the Action Planning Authorities relates to major roads, with in excess of 6 million vehicle passages per year, as defined in the Regulations. As parts of the functional areas of the Councils of the County and City of Kilkenny are affected by the noise

from these roads both local authorities are considered designated action planning authorities.

#### 4.1 Name and contact details for the responsible Authorities

The following are the contact details for the responsible authorities:

Kilkenny County Council County Hall John Street Kilkenny Telephone(056)7794000 Fax: (056)7794004 Email: <a href="mailto:info@kilkennycoco.ie">info@kilkennycoco.ie</a>	Kilkenny Borough Council City Hall High Street Kilkenny Telephone(056)7794500 Fax: (042)7794509 Email: <a href="mailto:info@kilkennycity.ie">info@kilkennycity.ie</a>
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Kilkenny County Council is the Lead Authority in developing the Noise Action Plan.

#### 4.2 Description of Other Bodies of Relevance

The Environmental Protection Agency (EPA) is the designated 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 and is responsible for reporting information to the European Commission.

The National Roads Authority (NRA) is the designated noise mapping body acting on behalf of the action planning authorities for major roads where such roads are classified as national roads. In the case of County Kilkenny, the only noise sources for the first round action plan are major roads.

Both the EPA and the NRA have been consulted in relation to the Draft Action Plan.

#### **4.3 Description of any Noise- Reduction Measures Already in Force Within the Action Planning Area, or Projects in Preparation**

Transport 21 identified significant levels of investment to be made in the national road network in County Kilkenny and includes the development by 2010 and 2015 of the following routes in their entirety to motorway/high quality dual carriageway standard;

- Cork to Dublin (N/M8) Completion date 2010
- Waterford to Dublin (N9) Completion date 2010
- Waterford City Bypass (N25) Completion date 2010
- Rosslare to Waterford (N25) Completion date 2015

Further major improvements on other national primary routes outlined in Transport 21 within the county include the N24 and N25 routes, which are an integral part of the western corridor from Sligo through Limerick to Rosslare.

The Regional Planning Guidelines identified other National and Regional Roads which provide critical intra-regional and inter-regional linkages. Improvements to this road network will enhance connectivity between the Hubs, County Towns and neighbouring regions. The priorities as identified by the RPGs in Kilkenny are:

- N76 Kilkenny to Clonmel
- N77 Kilkenny to Durrow
- R700 Kilkenny to New Ross

Specifically, it is an objective to complete the following major road improvement projects over the plan period:

##### **National Primary Routes**

- a) To complete the N8/M8 route (Cullahill to Cashel) to Motorway or Dual carriageway standard.
- b) To complete the N9 (Waterford to Dublin) to motorway /dual carriageway standard.
- c) To complete the Waterford bypass and second river crossing along the N25 to dual carriageway standard.
- d) The upgrading of the N25 route between Waterford and New Ross with a bypass for New Ross.
- e) The completion of the upgrading of the N24 Waterford to Carrick-on-Suir route including a bypass for Mooncoin.
- f) Continue with the pavement improvements on the existing N9, N10, N24 and N25 routes.

- g) Improvement of the existing N10 Ring road, from the Carlow Road Roundabout to the Waterford Road Roundabout.
- h) Improvement of the existing N10 from the Carlow Road Roundabout to the Leggetsrath Roundabout.
- i) To improve, in accordance with best design standards and in accordance with proper planning, the connectivity between the existing N10 National Primary Route and the proposed N9 link. The location of connection to be decided following full spatial planning, technical and economic evaluation and in consultation with the National Roads Authority.

#### National Secondary Routes

- a) The completion of the outer ring road to Kilkenny City from the N10 Carlow road to the N77 Castlecomer Road
- b) The realignment of the N76 Callan to Kilkenny road
- c) The realignment of the N77 from the Castlecomer roundabout to the county boundary with Laois
- d) To identify and protect a route corridor for the northward extension of the Waterford outer ring via a third river crossing to the N25.

The above projects will directly affect areas currently exposed to traffic generated noise by reducing the levels of traffic in these areas or through the introduction of noise mitigation measures.

## **5 Summary of the Results of the Noise Mapping**

### **5.1 Overview of the Preparation of the Noise Maps**

The National Roads Authority (NRA) is the designated noise mapping body acting on behalf of the action planning authorities for major roads where such roads are classified as national roads.

In the case of County Kilkenny, the only noise sources for the first round action plan are major roads.

In 2007 the strategic noise mapping was generated by the NRA in respect of these major roads carrying in excess of 6 million vehicles per annum. The location of these roads was identified using data obtained from the National Road Authority traffic counters located within the County as detailed in the NRA Report National Roads and Traffic Flow 2004 (2005) - Preliminary figures June 2005.

#### **5.1.1 Data Sources Used to Compute the Various Noise Levels**

The noise maps were generated using computer modelling as recommended by the European commission's advisory group on environmental noise. The UK national computation method "Calculation of Road Traffic Noise (CRTN), Department of Transport – Welsh Office, HMSO, London, 1988" as recommended in Part II of the Second Schedule of the Environmental Noise Regulations 2006 (S.I. No. 140 of 2006) was used for all calculations.

A noise map is a graphical representation of the situation with regards to noise in a particular area with different colours representing different noise levels in dB(A). To produce a noise map a number of variables must be determined in order to correctly represent the amount of noise generated at the source, i.e. by traffic driving on the road. The noise level at the source is primarily influenced by the following:

- Traffic flows
- Vehicle Type
- Traffic Speed

- Road Width
- Road gradient
- Road-side feature such as walls, buildings and boundary profiles

Geographical Information Systems (GIS) grids of noise levels were generated by the NRA based on data sets for the above. GIS noise contour polygons in 5dB contour bands from 55dB to >75dB were generated by Compass Informatics on behalf of the EPA, based on the noise modelling process. This information was subsequently distributed to the Local Authorities in ESRI shape-file format for use with ArcGIS.

### **5.1.2 Population Exposure Data**

In 2007, ISONIQ was commissioned by the EPA to generate GIS population data to indicate the extent of population living within each noise contour band. Utilising the 2006 Census Small Area Population statistics from the Central Statistics Office and the Quarter 2 -2007 Geo-directory listings, a layer of Electoral Districts (ED) that have an average population per household (Residential Points in the Geo-directory) figure was created for each ED polygon.

By cross referencing the Geo-directory (residential) locations in each noise contour band with population data, the population exposure for each band was estimated for the relevant section of road. The statistics were subsequently broken down on a county by county basis and issued to the Local Authorities with responsibility for the generation of Action Plans.

## **5.2 Presentation of Results**

### **5.2.1 Noise Maps**

Noise maps for major roads in County Kilkenny are presented in Appendix E. The maps are prepared for  $L_{den}$  and  $L_{night}$  and are presented in 5dB contour bands.

## 5.2.2 Summary Exposure Statistics for Action Planning Area

The following tables give estimated population exposed to traffic noise in each noise band for  $L_{den}$  and  $L_{night}$  within County Kilkenny based on data obtained from the EPA.

Road / Location	$L_{den}$	Population (Estimate)
Kilkenny	55-59	1086
Kilkenny	60-64	48
Kilkenny	65-69	5
Kilkenny	70-74	5
Kilkenny	>75	0
Waterford Environs	55-59	626
Waterford Environs	60-64	149
Waterford Environs	65-69	51
Waterford Environs	70-74	0
Waterford Environs	>75	0
	<b>TOTAL</b>	<b>1970</b>

**Table 5.2  $L_{den}$  exposure limits**

Road / Location		$L_{\text{night}}$	Population (Estimate)
Kilkenny		50-54	272
Kilkenny		55-59	332
Kilkenny		60-64	211
Kilkenny		65-69	0
Kilkenny		>70	0
Waterford Environs		50-54	101
Waterford Environs		55-59	33
Waterford Environs		60-64	24
Waterford Environs		65-69	16
Waterford Environs		>70	0
		<b>TOTAL</b>	<b>989</b>

**Table 5.3  $L_{\text{night}}$  exposure limits**

### 5.3 Limitations of the Maps / Results

The strategic noise maps for Kilkenny County have been generated using data obtained from the National Road Authority traffic counters located within the County as detailed in the NRA Report National Roads and Traffic Flow 2004 (2005) - Preliminary figures June 2005. As the maps are generated by predictive computer modelling, and actual field data is not incorporated into the model, the maps are considered only to be an estimate of the likely noise levels.

The effects of any noise mitigation measures currently in force or implemented since the preparation of the noise mapping, or noise generated by sources other than major roads within the study criteria have not been considered within the computer modelling.

Furthermore, the N77 Ring Road Extension has now been completed diverting traffic away from certain urban areas. The Environmental Impact Assessment (EIA) for this project contains provision in relation to noise mitigation on the new route.

The Waterford By-Pass and the N9 Dublin to Waterford High Grade Dual-Way/Motorway are currently under construction and noise mitigation assessments have been considered under their respective EIAs. The New Ross By-Pass EIA has been completed and is progressing to the CPO stage.

Improvement works to the N10 Ring Road in Kilkenny are currently at design stage.

The above projects will in due course reduce the volumes of traffic and associated noise within the extents of the current noise mapping areas of interest under Phase 1.

Under the Regulations it is required to delimit quiet areas in open country. The requirement for such an area is that it is “*undisturbed by noise from traffic, industry or recreational activities*”. In the context of the Scope of the Regulations it can be seen that the strategic noise mapping undertaken as part of the first phase of the Regulations will not provide a resource which may be extensively used to help identify quiet areas in open country. This is partially due to the nature of assessed noise sources, which do not include recreational activities, and partially due to the area of coverage of the strategic noise mapping, which is near to major sources, and therefore not locations which will be undisturbed by them.

## **6 Identification of Areas to be subject to Noise Management Activities**

The results of the strategic noise mapping provide information on the assessed noise levels at properties within the assessment area, along with an estimate of the number of inhabitants. These resultant datasets may then be used in combination with the recommended onset of assessment noise levels to develop a noise scoring decision matrix. This decision matrix is used to draw up a shortlist of potential areas for action, both above the onset values, and below the level for preservation to help identify Quiet Areas.

The decision matrix takes into account factors including the noise exposure level, type of noise receptor, the type of noise source and the number of people affected. Appendix D provides an example of a prioritisation decision matrix based on work by Dublin City Council.

With regard to major roads, which are the primary noise source for Kilkenny County, the onset levels, for assessment of noise mitigation measures and for assessment of noise preservation where they are good, for roads, are set out in Section 6.1.1. As there are no defined limits in relation to environmental noise exposure, the onset levels have been selected on the basis of current best practice as outlined in the EPA guidance Note for Noise Action Planning.

### **6.1 Description of the Decision Matrix**

#### **6.1.1 Onset of Assessment Levels**

Under the regulations, the noise due to road traffic sources is required for all roads within agglomerations, and more major roads outside agglomerations above a traffic flow level threshold. As the definition of a major road only considers the volume of traffic flow, the roads included within the assessment may be motorways, National Roads or Regional Roads and will not necessarily be all examples of any one class.

The NRA Guidelines for the design of new national roads indicate that mitigation measure should be considered above a level of 60 dB  $L_{den}$  free-field, with an initial draft including a 50 dB  $L_{night}$  free-field criterion. The UK PPG24 suggests that planning for new housing should not normally be granted for levels above 63 dB  $L_{Aeq, 16hr}$  and 57 dB  $L_{Aeq, 8hr}$ . The UK Noise Insulation Regulations set out a level of 68 dB  $L_{A10, 18hr}$ , above which a noise insulation package must be offered to property owners.

Having due regard to the above, and in accordance with the guidance issued by the EPA the following onset of assessment noise levels apply in relation to roads:

For assessment of noise mitigation measures

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

For assessment of noise level preservation where they are good

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

These levels reflect an annual average 24 hour period.

## **6.1.2 Protection Thresholds for Quiet Areas**

### **6.1.2.1 Quiet Areas within Agglomerations**

Under Article 3(1) of the Regulations it is required to delimit quiet areas within agglomerations. The strategic noise maps generated by the National Roads Authority provide an assessment of the environmental noise levels across the whole of the agglomeration for roads, railways, industrial and air traffic sources. This assessment can be of assistance in the identification of quiet areas.

It is noted that under the terms of reference in the regulations and particularly in relation to population size, there is no designated agglomeration in County Kilkenny, and accordingly there is no requirement to identify quiet areas within the County.

There is no universally accepted definition of what constitutes a Quiet Area within an agglomeration. The EPA Guidelines suggest that these areas could be defined based purely on noise related criteria or in terms of related aspects such as land use, local amenity value, accessibility and historic usage. It is further suggested the Quiet Areas could be considered as those areas of the noise maps below 55 dB  $L_{day}$ . These Areas could be cross referenced to a dataset of public open spaces to produce a schedule of quiet areas. The following could be considered to be included as public open spaces in this context:

- Recreational areas
- Playing fields
- Playgrounds
- Public parks and gardens
- Beaches
- Nature reserves
- Cemeteries
- River banks
- Canals

The Action Planning Authority may also wish to consider a second category of location such as the grounds around potentially noise sensitive premises such as:

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

The EPA Guidelines suggest that it may be relevant for the Action Planning Authority to protect by designation some public open spaces, which may currently have low levels of environmental noise as indicated by strategic noise mapping, but have much higher existing noise levels due to other noise sources not considered within the scope of the mapping such as recreation, entertainment or neighbourhood noise. Similarly, there may be other areas which may be protected through designation, due to usage or utility, despite having a reasonably high level of environmental noise as indicated by the strategic noise mapping. A selection criteria or decision matrix should be developed to identify and propose such areas for delimitation and that a reasoned case for designation is developed for each area which may not initially be obviously quiet. Following a consultation process with the public, the EPA and other relevant stakeholders a list of Candidate Quiet Areas could be drawn up for submission to the EPA and the Minister for designation. On designation a policy statement would be required in the Action Plan setting out the extent of protections required and proposed mitigation measures.

#### **6.1.2.2 Quiet Areas in open country**

Under Article 3(1) of the Regulations it is required to delimit quiet areas in the open country. The requirement for such an area is that it is *“undisturbed by noise from traffic, industry or recreational activities”*.

The strategic noise maps generated by the National Roads Authority provide an assessment of the environmental noise levels across agglomerations for roads, railways, industrial and air traffic sources. However, this does not provide an adequate resource which may be extensively used to help identify quiet areas in open country. This is partially due to the nature of the assessed noise sources which do not include industrial or recreational activities, and because the area of coverage of the strategic noise mapping relating to major noise sources does not cover locations unaffected by these noise sources.

Consideration can be given by the Action Planning Authority to widening the scope of the Action Plan to include Quiet Area in open country away from the major noise sources and to delimit such areas for approval. It is further considered that the assessment of Quiet Areas in open country should not be limited solely to acoustic criteria but should take cognisance of the landscape characteristics, heritage, ecology and cultural aspects of the area under consideration.

In the context of the Regulations, it is envisaged that any areas put forward for designation as Quiet Areas in Open Country would have low levels of environmental noise, and be predominantly free of long term noise effects from human activity.

The provisions of the Kilkenny County Development Plan 2008-2014 outline current environmental policies and the Action Plan should take cognisance of these policies and be used to further develop these policies to incorporate the requirements of the Environmental Noise Regulations. Further guidance in relation to the assessment of Quiet Areas can be obtained in research carried out by Waugh and Durucan, and Symond Group and Campaign to Protect Rural England.

### **6.1.3 Application of the Criteria / 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.

The following Table is an example of a prioritisation decision support matrix based on work by Dublin City Council. A score of 17 or above was used to indicate that threshold levels have been exceeded and the location should be included in the shortlist for further assessment.

This type of matrix will be used in the assessment of noise sensitive locations within the strategic noise mapping area for implementation of mitigation measures in the first phase of the Action Plan.

**Table 6.1: Priority Matrix**

PRIORITY MATRIX	LOCATION:			
	Decision Selection Criteria	Score Range	Score Range	Subtotal
		L <sub>den</sub>	L <sub>night</sub>	
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	Urban Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	3	3	
	Quiet Area	3	1	
	Recreational open space	2	2	
TYPE OF NOISE SOURCE	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			<b>TOTAL</b>	

#### **6.1.4 Results of the Analyses**

The current data relates to the generated noise mapping and a detailed analysis of the noise mapping areas has yet to be conducted. It is proposed to complete the analysis within the first year of the Action Plan following a review of the night time levels as recommended by the NRA. Furthermore, it is proposed to conduct a more detailed analysis of the strategic noise mapping to determine the individual areas required mitigation measures using the decision support matrix as shown in Table 6.1.

### **7 Mitigation and Protection Measures**

#### **7.1 Management of Areas above Onset of Assessment Criteria**

The initial stage of the management of areas, which are indicated to be above the threshold where noise mitigation measures are deemed necessary, is to conduct a review of existing noise mapping. The review shall identify the order of priority of potential areas for subsequent treatment.

On completion of the initial assessment, a field survey of actual noise levels shall be carried out to verify the initial finding and confirm the order of priority for treatment. As part of the establishment of the order of priority, the most appropriate and cost effective mitigation measures shall be identified to optimise the return from the mitigation process. A similar decision support matrix to that shown in Table 6.1 can be generated to facilitate this process.

On implementation of the noise mitigation measures, the areas in question shall be resurveyed to establish the effectiveness and extent of the mitigation measures.

A review of this process should be conducted during the various phases of the Action Plan to refine and develop the long term strategy for noise management for Kilkenny County.

#### **7.2 Preservation of Areas below Protection Threshold**

Preservation of areas below the protection threshold shall be achieved by the development of strategies for the management of noise within the scope of the Planning and Development policies for the County and City Environs of Kilkenny. Through the County Development Plan and the City Environs Plan, Local Area Plans, the planning process and relevant environmental legislation, a clear policy can be established in relation to environmental noise, such that in order to control development, any development that may have significant adverse impacts on areas below the protection threshold will include mitigation measures to preserve

or reduce existing noise conditions. Where, this is not achievable, consideration shall be given to curtailing or not permitting such development.

The Action Plan shall be reviewed at 5 year intervals in accordance with the Regulations or as necessary where a material change in an area's noise profile occurs. These reviews shall take cognisance of noise monitoring conducted in the intervening periods.

### **7.3 Management of Areas Between the Thresholds**

The policies developed for the preservation of Areas below the Protection Threshold can be adopted for control and management of noise for areas of future development. Areas which lie between those areas requiring noise mitigation and Quiet areas will benefit from the mitigation measures introduced for area of high levels of noises and the maintenance of the low levels in the quiet areas.

### **7.4 Future Developments- Impact and Management**

Since the strategic noise mapping was carried out by the National Roads Authority a number of major road construction projects scheduled for County Kilkenny have commenced or are in the planning and design stage.

The N77 Ring Road was opened to traffic in December 2007 and has significantly reduced the volume of traffic on the section of the old N77 between the Dublin Road Roundabout and the Castlecomer Road at the new Ring Road tie-in. There is a resulting significant drop in noise on this section of road. The extent of residential and commercial development on the Ring Road extension is considerably less and accordingly a significant improvement in noise impact is expected when detailed field noise surveys are conducted. An assessment of existing noise levels on the Ring Road Extension is currently underway to determine the extent of noise mitigation measures to be put in place.

The following motorway/high grade dual carriageway projects are currently under construction:

- Construction of Waterford By-Pass
- Construction of N9 Dublin to Waterford High Grade Dual-Way/ Motorway
- Construction of M8 Cashel to Cullahill Motorway

These projects have been the subject of environmental impacts assessments, and also include construction requirements in relation to the mitigation of noise generation. These projects will reduce volumes of traffic affecting parts of Kilkenny City Environs and Waterford City Environs, within the areas requiring noise mitigation measures.

The New Ross By-Pass is progressing to Compulsory Purchase Order stage. This scheme will reduce the volume of traffic through New Ross, thereby taking traffic volumes in the affected area below the minimum threshold whereby mitigation measures are required.

The N10 Dublin Road Improvement Scheme is currently at design stage. Noise mitigation measures for this section of road will be considered as part of this project.

## **7.5 Confirming the Extent of Noise Impact**

The strategic noise mapping prepared by the National Roads Authority has identified the primary areas affected by environmental noise within the thresholds established under the first phase. It is envisaged that the majority of the key infrastructural road projects in County Kilkenny will be completed by the end of 2010. This will have a significant impact on the areas already identified as requiring noise mitigation measures. A review of the traffic volume data on the newly completed sections of road will identify revised locations that may require noise mitigation measures on the basis of the first phase thresholds. In the interim, baseline noise level studies can be conducted to assess the impact of the new infrastructure on the areas currently identified as requiring treatment. By conducting field surveys and noise monitoring, it will be possible to refine the current noise mapping models to re-assess the support decision matrix with regard to noise mitigation measures.

In 2012, the thresholds, where noise mitigation is required are significantly reduced and additional areas will fall within the required study area. An assessment of these areas will be conducted under the Phase 2 review.

## **7.6 Review of Possible Mitigation Measures**

### **7.6.1 The Planning System**

The appropriate use of the planning system can be used to 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 considered as being a material issue:

- Introducing people into potentially noisy areas through the provision new residential housing, hospital, schools nursing homes etc in the vicinity of existing road rail industrial or airport noise, or where there are potential

- Introducing potentially noisy developments such as new or altered roads, railways, industrial sites, and airports, commercial or large sporting recreational developments into the vicinity of noise sensitive locations.

In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA Guidelines suggest that in the interim that Action Planning Authorities take under consideration the planning policy guidance notes issued by the Department of Environment in England (DoE (England), Planning Policy Guidance Note PPG24: Planning and Noise, September 1994) and The Scottish Office (The Scottish Office, Planning Advice Note PAN 56: Planning and Noise, April 1999).

In the second scenario, where new, or altered, sources of noise are introduced to existing residential or other noise sensitive locations; there is currently a number of guidance documents, which cover some of those situations as previously outlined. Where existing guidance does not cover the situation under consideration, it is recommended that the planning advice notes from the Department of Environment in England (*DoE (England), Planning Policy Guidance Note PPG24: Planning and Noise, September 1994*), The Scottish Office (*The Scottish Office, Planning Advice Note PAN 56: Planning and Noise, April 1999*) and BS 4142 (*BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas, British Standards Institution (BSI), London 1997*) are taken into consideration.

The EPA Guidelines recommend that the Noise Action Plans contain a review of the use of the planning system to help manage the effects of environmental noise within the area covered. Any evaluation criteria to be used shall be specified, or relevant documents are to be referenced.

It is within the remit of the Action Planning Authority to determine that any approach to controlling environmental noise through the use of planning policy set out within the Action Plan, may be made relevant to the whole area under the control of the APA, if considered appropriate, and not restricted solely to the area covered by the strategic noise mapping.

### **7.6.2 Abatement Measures**

There are a variety of potential noise mitigation measures, some of which may be instigated at a national or regional level, others which may be more localised. Likewise there are a number of different authorities who are in a position to put into place policies and mitigation measures.

A non-exhaustive list of potential actions could include the following:

- EU regulated vehicle noise emissions and tyre noise regulation
- National planning guidance or noise regulation to be established at national level
  - Transport policy objectives may be set at regional level
  - Improved public transport
  - Getting people out of cars; and
  - Increasing bus, train, bicycle journeys
- At local authority levels there are powers to introduce policies for:
  - Replacement of fleet vehicles with compressed gas/electric vehicles
  - Establishment of truck routing
  - Night time delivery restrictions or limits
  - Road closures / traffic routing
  - Road re-surfacing
  - Planning zones
  - Façade insulation requirements
  - Noise barriers
  - Public liaison groups; and
  - Long term targets
- Airport operators could implement :
  - Noise surcharges
  - Fines for off track aircraft
  - Aircraft restrictions
  - Noise level limits
  - Operating restrictions
  - Defined periods of respite

- Purchase of most affected properties
- Land use planning process; and
- Noise insulation packages
- Road Authorities could implement the following:
  - Traffic management –route and HGVs
  - New infrastructure – bypass and relief roads
  - Resurfacing of roads with low noise surfacing systems
  - Vehicle speed management
  - Noise screening measures; and
  - Façade insulation measures
- Railway operators may implement the following:
  - Railway head grinding
  - Fleet renewal
  - Electrification of lines
  - Replacement of tread brakes with disk brakes
  - Vehicle speed management
  - Noise screening measures; and
  - Façade insulation measures

Where Kilkenny Local Authorities identify potentially beneficial actions for which they are not the direct overseeing authority, it is intended that they would liaise with the relevant authority to discuss the viability of actions or support any move by other authorities to undertake the desired action.

## **7.7 Assessment of the Effectiveness of Noise Reduction Measures**

On establishment of a schedule of the areas requiring noise mitigation measures, corresponding actions to achieve the appropriate noise reductions shall be determined. Each area to be treated may require one or more measures to achieve the intended result. These actions shall be prioritised by undertaking a

cost benefit analysis on the potential actions under consideration in order to maximise value for money and deliver benefit from investment.

## **7.8 Budget and Cost Benefit Analysis**

The cost-benefit analysis of potential actions to be introduced for noise mitigation should address the lifetime construction and maintenance costs against noise reduction benefit.

The cost benefit analysis would be dependent on the assessment approach adopted to determine the extent of noise reduction. A simplified approach would be to consider global source related measures or alternatively if specific local measures are being considered the approach becomes more complex. Strategic noise models could be used to conduct scenario testing for a range of noise reduction design options, although it is noted that certain measures, such as enhanced barrier design and quiet pavement surfaces, may be difficult to incorporate into the current calculation models.

The benefit of noise reduction may be viewed in terms of decibels, people or time or could be monetised to fully process the analysis. Monetisation of noise is becoming increasingly common and various approaches and valuations may be found within reports such as HEATCO, Developing Harmonised European Approaches for Transport Costing and Project Assessment, Final Technical Report, December 2006, Department of Transport, Transport Analysis Guidance, Noise TAG Unit 3.3.2, November 2006, Transport Scotland, Scottish Transport Appraisal Guidance, 6.11 Noise and Vibration, September 2006. However, it is important to note that monetary assessments of noise levels studies tend to take two different approaches, either based on impact upon property market value or the willingness of affected residents to contribute to pay for noise reductions. As may be expected these tend to result in somewhat differing levels of financial benefit.

The Action Planning Authority may take into consideration the guidance contained within the *Community Support Framework Evaluation Unit, Proposed Working Rules for Cost Benefit Analysis, June 1999* when undertaking the cost benefit analysis of the mitigation options.

Prior to establishing the appropriate Cost Benefit Analysis to be adopted, consultation should be carried out with the primary authorities with a direct input in relation to the particular noise source. In the case of County Kilkenny, where

the primary noise source is generated from roads, the appropriate authorities are Kilkenny County and City Councils, the EPA and the National Roads Authority.

Following the cost-benefit analysis, the locations being reviewed will be prioritised to give a list of beneficial, achievable actions for noise mitigation.

## **7.9 Outcome**

Following on from the initial strategic noise mapping generated by the National Roads Authority, it is the intention of Kilkenny County Council, to conduct a review of the supplied data to verify the extent and quality of the data. This will include field noise surveys to establish baseline field data and to assess the changes to the noise distributions on completion the various infrastructural projects which directly impact on the areas initially identified. Furthermore, these projects may generate additional noise, and assessment of the levels generated shall be conducted to assess the effectiveness of the noise abatement measures incorporated with the schemes. With the reduction of the thresholds where noise mitigation measures are required in 2012, any additional areas which require attention will be surveyed and assessed. Kilkenny County Council will develop and further refine policies in relation to noise quality, noise mitigation measures and protocols for the preservation of existing noise levels.

## **8 Public Participation**

Pursuant to Article 11 (6) of the Regulations Kilkenny County Council is required as the relevant Action Planning Authority to consult the public when drawing up and revising Action Plans.

The consultation process shall be planned and undertaken having regard to the Department of the Taoiseach publication "*Reaching Out Guidelines on Consultation for Public Sector Bodies*".

This Draft Noise Action Plan aims to meet the requirements of the Regulations and to outline the approach to be adopted by Kilkenny County and City Councils in relation to the identification, monitoring and mitigation against high noise levels and the preservation of quiet areas. It incorporates a commitment to establish policies and protocols in relation the treatment of noise and to conduct regular review as outlined in the Regulations.

A formal public consultation shall be undertaken on the Draft Action Plan, as detailed below. This will give the public an early and effective opportunity to participate in the preparation of the plan.

The Draft Action Plan will be placed on public display for 6 weeks, during which, and for a further two weeks thereafter, written submissions will be accepted. Notification shall be placed in the local papers in advance advising the public of the locations where the plan was on display and the relevant times and dates. A copy of the Draft Action Plan will be displayed in the following locations:

- Kilkeny County Council, County Hall, John St., Kilkeny,
- Kilkeny Borough Council, City Hall, High St. Kilkeny,
- Kilkeny County Council, Newrath Area Office, Newrath, Co. Kilkeny

A copy will also be available on the Kilkeny Local Authorities Website [www.kilkennycoco.ie](http://www.kilkennycoco.ie) and shall be on public display from 14<sup>th</sup> August 2009 to the 25<sup>th</sup> September 2009.

The public shall be invited to make submissions in writing or by e-mail. Submissions or observations with respect to the Draft Noise Action Plan may be made in writing to the following:

**John Mulholland**, Director of Services, Transport, Emergency Planning & Corporate

or

e-mailed to [noiseplan@kilkennycoco.ie](mailto:noiseplan@kilkennycoco.ie) to arrive no later than the advertised date.

Submissions shall be made on or before Friday 9<sup>th</sup> October 2009.

Following the public consultation the results of the public participation will be taken into consideration when finalising the Noise Action Plan. A summary of the submissions received will be incorporated in the final report.

Once the Noise Action Plan is made, it will be published in electronic format, within 28 days of being finalised. A notice to this effect will be placed in the local papers.

## **9 Implementation Plan**

### **9.1 Roles and Responsibilities**

Kilkeny County Council is the designated Action Planning Authority on behalf of both Kilkeny City and County Local Authorities.

The primary noise source requiring mitigation within the county is generated by National Roads. Accordingly, the National Roads Authority and the Environmental Protection Agency are the major stakeholders with direct input in

the development of the Action Plan. Kilkenny County Council shall be responsible for the implementation of the Noise Action Plan.

## **9.2 Targets and Objectives**

The aim of the Environmental Noise Directive is “to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise”.

The objective of the Directive is to establish an EU wide approach to avoid prevent or reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health, and to preserve existing good quality environmental noise levels.

The Regulations identify and assign responsibilities to the particular organisations required to produce strategic noise mapping, and to those organisations responsible for the development of action plans.

Kilkenny County Council as the Action Planning Authority must produce Action Plans for the first round during 2008, for the second round in 2013 and every five years thereafter. The Action Plan must be produced based on the results of the noise mapping. It is also required to review and revise the noise maps, if necessary, from time to time and whenever a major development occurs affecting the existing noise situation.

The long term objective is to either eliminate or substantially reduce the noise exposure to residents within the subject areas requiring noise mitigation measures. The establishment of designated Quiet Areas in Open Country, which are subject to EPA and Ministerial Approval will focus on areas of national, regional or local importance in terms of landscaping cultural and historical aspects, amenity areas and environmentally sensitive locations.

These objectives will be achieved through the ongoing development of the Noise Action Plan and through the National planning processes and regulations and the County and City Development Plan. This approach will be supported by a process of regular review and verification by on site field surveys and measurement within the specified timeframes for the Action Plans.

## **9.3 Programme of Works**

It is proposed to develop a process within the Noise Action Plan to effectively manage environmental noise throughout the County. The initial programme will be phased over 5 years culminating in the preparation of the 2<sup>nd</sup> phase noise action plan to be completed in 2013. The proposed phasing of the plan development is as follows:

- **Year 1 -2009**
  - Review NRA Strategic Noise Mapping
  - Confirm areas requiring noise mitigation measures
  - Prioritise impacted areas and develop support decision matrix
  - Consult with NRA and the Department of Transport on brief for external noise consultants for the carrying out of field verification studies
  - Identify Quiet Areas in Open Country for EPA and Ministerial approval.
  - Review County Development Plan 2008-2014 with a view to incorporating Noise Action Plan
  - Review of noise assessment of N77 Ring Road Extension to identify if noise mitigation measures required.
  
- **Year 2 -2010**
  - Confirm financial funding for procurement of field studies
  - Engage external noise consultants
  - Conduct baseline studies of existing areas requiring mitigation measure as per noise mapping prior to completion of key road infrastructure
  - Annual review of Noise Action Plan
  
- **Year 3 - 2011**
  - Re-assess areas requiring mitigation measures post completion of road infrastructure
  - Identify areas still requiring noise mitigation measures
  - Develop priority list of actionable works to mitigate against excessive noise and conduct cost benefit analysis.
  - Establish and agree budgets for mitigation works with relevant authorities
  - Establish programme of noise monitoring end extents for areas which will be covered under the revised threshold to be carried out in 2012.
  - Annual review of Noise Action Plan
  
- **Year 4 - 2012**
  - Conduct review of Noise Action Plan to incorporate revised thresholds for Phase 2
  - Conduct public consultation on basis of revised thresholds
  
- **Year 5 – 2013**
  - Review and confirm Quiet Area for delimiting and submit proposal to EPA and Minister
  - Finalise Action Plan for period 2013 -2018

- **Post 2013**
  - Conduct review of Action Plan in 5 years cycles

#### **9.4 Evaluation and Review**

The above programme over the initial 5 year first phase of the development of the Noise Action Plan proposes to review the Action Plan on an annualised basis or as the need arises. As previously indicated a significant portion of the areas originally identified as requiring mitigation measures in the NRA noise mapping exercise will be directly affect by the completion of a number of key infrastructural by-pass and motorway projects. These projects are either complete or will be completed by the end of 2010. This will significantly change the focus and extent of verification and assessment of the original areas and potentially introduce new areas for consideration. Accordingly, it would be considered valid and prudent to programme the field studies to coincide with the period of change-over of traffic patterns on completion of individual schemes, to establish the “before and after” effect of these schemes which are inherently mitigation measures in themselves, for the currently affected areas. This approach will enable Kilkenny County Council to review any residual noise issues and determine if any new areas requiring attention are generated.

#### **9.5 End of Program Review**

At the end of the first phase period in 2013, Kilkenny County Council will conduct a review of the programme of works and policies developed over the first 5 years. The review will assess the effectiveness of the measures adopted and determine if the measures were cost effective and value for money. The second phase will address the introduction of the lowered thresholds and take into consideration the findings of the first phase assessment and implemented mitigation works. This process will be refined and development over the following phases at 5 year intervals.

### **10.0 Summary and Conclusion**

Kilkenny County Council has prepared this Draft Noise Action Plan in accordance with the requirement of the 2006 Environmental Noise Regulations (S.I. No. 140 of 2006).The Plan is based on the strategic noise mapping prepared by the

National Roads Authority, as the only noise source requiring assessment is generated by major roads as determined by the current threshold levels.

The Noise Action Plan sets out the role and responsibilities of Kilkenny County Council in regard to existing noise levels and the mitigation and protection measures for areas identified for treatment. The Plan includes an approach to the prioritisation and analysis of areas for which mitigation measures are required and the determination of Quiet Areas.

A cost benefit analysis shall be conducted to prioritise list of actionable works for noise mitigation.

A review process to assess the impact of the measures adopted by the Action Planning Authority shall be implemented at regular intervals.

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## 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
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)

<b>Term</b>	<b>Definition</b>
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: $L_{den} = 10 * \log 1/24 \{ 12 * 10^{(L_{day})/10} + 4 * 10^{(L_{evening}+5)/10} + 8 * 10^{(L_{night}+10)/10} \}$
Noise Level – $L_{A10,18h}$	$L_{A10,18h} = L_{A10,18h}$ (06:00 to 24:00)
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
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 Railverkeerslawai '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’.

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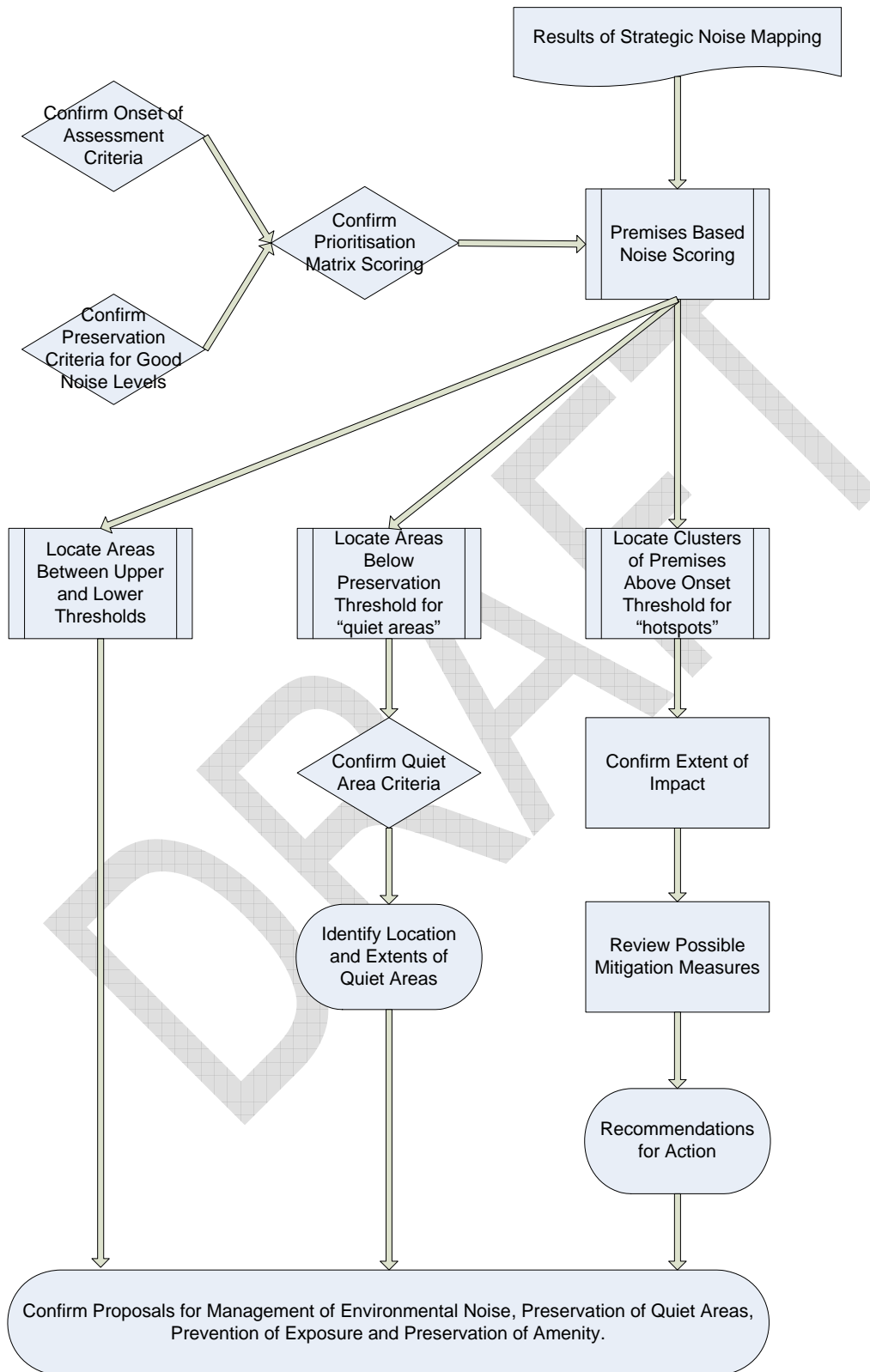
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## Appendix C: Overview / flow diagram of process for action planning decision making



## Appendix D: Final / completed Decision/Selection 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 D1 presents the prioritisation decision support matrix to be used to support the action planning decision making process.

**Table D1:** Example decision support matrix

		Priority 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	
	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	
<b>Total Score</b>				0

**Note:** for Air noise the L<sub>DEN</sub> column is used with the L<sub>Aeq,16hr</sub> results.

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 D2.

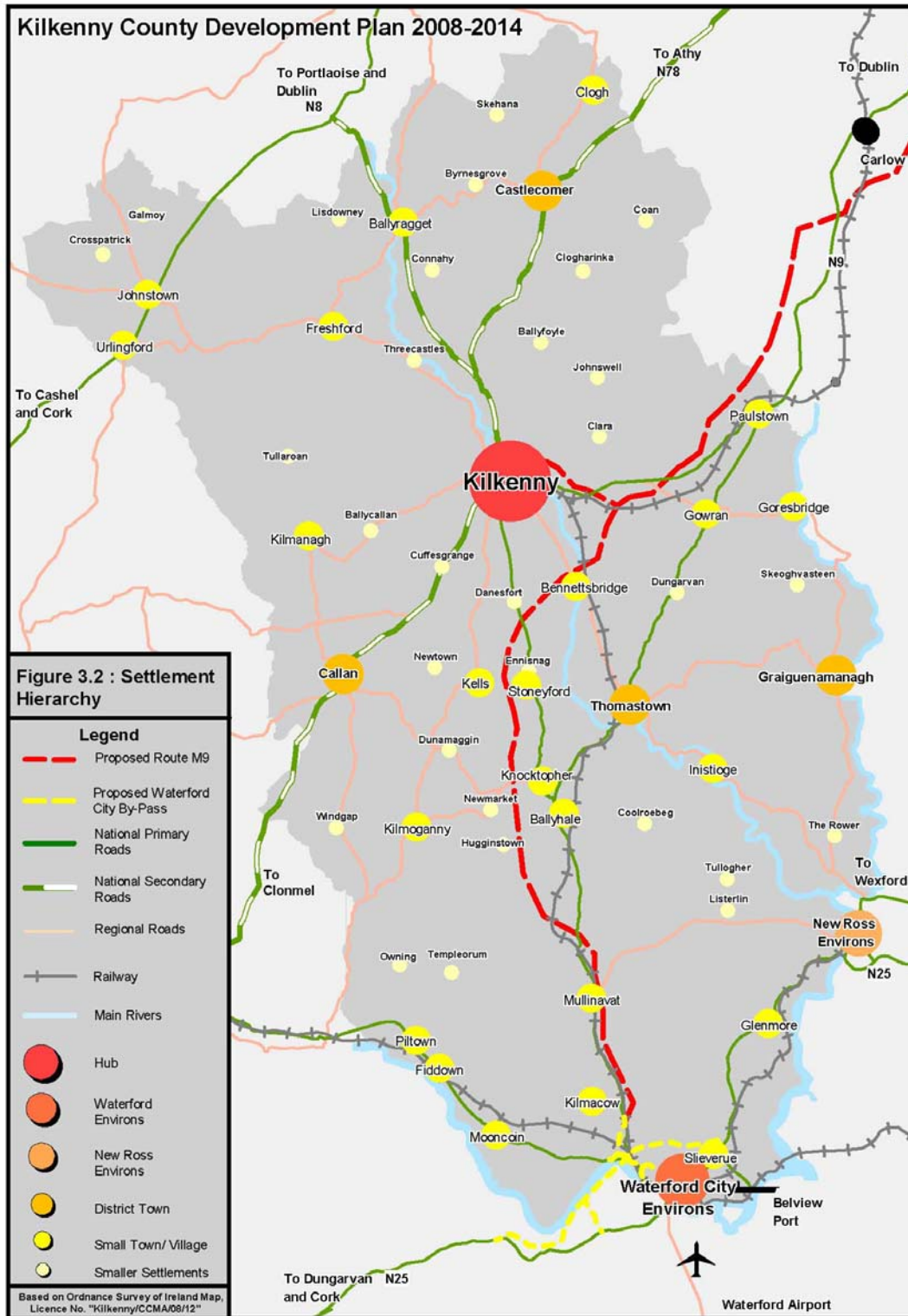
**Table D2:** Example of use of decision support matrix

		Priority Matrix		
		Location:		
Decision Selection Criteria		Score Range Lden	Score Range Lnight	SubTotal
Noise Band(dB(A))	<45	5	6	3
	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	5
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	3	3	
	Quiet Area	3	3	
	Recreational open space	2	2	
Type of Noise Source	Air	3	4	7
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
<b>Total Score</b>				<b>18</b>

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 E: Strategic noise map(s)



**Figure E1: Population Centres and Major Roads within County Kilkenny**

Figure E2 [Kilkenny City and Environs Noise Data – LDEN Master](#)

Figure E2.1: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.2: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.3: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.4: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.5: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.6: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E2.7: [Kilkenny City and Environs Noise Data - LDEN](#)

Figure E3 [Kilkenny City and Environs Noise Data – LNight Master](#)

Figure E3.1 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.2 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.3 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.4 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.5 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.6 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E3.7 [Kilkenny City and Environs Noise Data - LNight](#)

Figure E4 [Waterford Environs Noise Data – LDEN Master](#)

Figure E4.1 [Waterford Environs Noise Data - LDEN](#)

Figure E4.2 [Waterford Environs Noise Data - LDEN](#)

Figure E4.3 [Waterford Environs Noise Data - LDEN](#)

Figure E4.4 [Waterford Environs Noise Data - LDEN](#)

Figure E4.5 [Waterford Environs Noise Data - LDEN](#)

Figure E4.6 [Waterford Environs Noise Data – LDEN](#)

Figure E5 [Waterford Environs Noise Data – LNight Master](#)

Figure E5.1 [Waterford Environs Noise Data - LNight](#)

Figure E5.2 [Waterford Environs Noise Data - LNight](#)

Figure E5.3 [Waterford Environs Noise Data - LNight](#)

Figure E5.4 [Waterford Environs Noise Data - LNight](#)

Figure E5.5 [Waterford Environs Noise Data - LNight](#)

Figure E5.6 [Waterford Environs Noise Data - LNight](#)

Figure E6 [New Ross Environs Noise Data – LDEN Master](#)

Figure E6.1 [New Ross Environs Noise Data - LDEN](#)

Figure E6.2 [New Ross Environs Noise Data - LDEN](#)

Figure E6.3 [New Ross Environs Noise Data - LDEN](#)

Figure E7 [New Ross Environs Noise Data – LNight Master](#)

Figure E7.1 [New Ross Environs Noise Data - LNight](#)

Figure E7.2 [New Ross Environs Noise Data - LNight](#)

Figure E7.3 [New Ross Environs Noise Data - LNight](#)

## **Appendix: F: Public Consultation**

Within the public consultation process Kilkenny County Council shall make copies of this Draft Noise Action Plan available to access by the public at locations to be advertised throughout Kilkenny County, and by placing an electronic version on the website of the Council of the City and County of Kilkenny.

In addition, a number of statutory bodies and stakeholder organisations will be contacted and requested provide review and feedback on the proposals set out within the Draft Noise Action Plan as follows:

### **Government 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
- Laois County Council
- South Tipperary County Council
- North Tipperary County Council
- Waterford County and City Councils
- Wexford County Council

### **Regional Authorities**

- South-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 – Tramore House

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