
WICKLOW COUNTY COUNCIL

NOISE ACTION PLAN 2013

VERSION 1.01



**TRANSPORTATION & ROADS INFRASTRUCTURE DEPARTMENT,
WICKLOW COUNTY COUNCIL,
COUNTY BUILDINGS,
WICKLOW TOWN,
CO. WICKLOW.**

AUGUST 2013.

Wicklow County Council Noise Action Plan 2013

0.0 Document Control

This document "Wicklow County Council Noise Action Plan 2013 defines the methodology by which Wicklow County Council intends to fulfil its obligations under the Environmental Noise Regulations (SI 140 of 2006) with respect to the second round of Noise Action Planning.

Revision	Status	Revision Details	Issue Date
0.00	Draft Issue	For EPA Observations	27.5.2013
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1.00	Final Issue	Minor Revisions following Consultation Period	18.7.2013
1.01	Revised Final Issue	Correction to typing	09.8.2013

0.1 Acknowledgements

Wicklow County Council would like to thank Mr. Mervyn Keegan, of Envest Environmental Ltd. (formerly of White Young Green) for his assistance in authoring the First Draft Wicklow County Council Noise Action Plan in 2010. This Noise Action Plan 2013 is substantially based on the format of the original 2010 Noise Action Plan produced by White Young Green for Wicklow County Council.

Wicklow County Council would also like to thank the assistance of the EPA and the NRA in preparing this document and the relevant background data.

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EXECUTIVE SUMMARY

This Noise Action Plan 2013 has been prepared in accordance with the requirements of the SI 140 of 2006, also known as the Environmental Noise Regulations. These regulations give effect to the European Union Environmental Noise Directive 2002/49/EC (END), relating to the assessment and management of Environmental Noise.

The aim of the END 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 Noise Action Plans is

“preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good.”

Therefore, the key requirements of the END can be set out in three stages as follows:

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

Therefore, the action plans must reduce the existing noise climate where necessary and protect the future noise climate. The Noise Action Plan is therefore designed with the twin aims of:

- 1) Avoiding significant adverse health impacts from noise.
- 2) Preserving environmental noise quality where good.

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This Noise Action Plan 2013 has been prepared by Wicklow County Council and has focussed on the impact of major roads within County Wicklow. 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 County Wicklow. The methods used in production of strategic noise maps are outlined and the summary results are presented. The results have been analysed and recommendations made to limit population exposure to environmental noise pollution.

The Authority responsible is Wicklow County Council. They 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 “quiet areas”. Wicklow County 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.

The Noise Action Plan 2013 applies, as per the Noise Regulations 2006, to the areas adjacent to roads in County Wicklow, which experience traffic volumes in excess 3 million vehicles a year. Strategic Noise Maps have been prepared for all roads deemed to fall within the threshold of 3 million vehicles a year (approx 8,250 AADT) in County Wicklow which equates to 103 kilometres of roads or under 5% of the total length of roads in County Wicklow.

To address the lack of legislative measures and unify the approach taken by Action Planning Authorities the EPA have issued guidelines for the assessment of noise exposure and prioritising areas for noise mitigation measures. The proposed onset of assessment levels relating to road traffic noise mitigation measures are 70dB L_{den} and 57dB L_{night} .

The estimated population exposed to noise levels greater than 70dB L_{den} for major roads within the Action Plan Area equates to 977 people. This compares to a figure of 15 people in the First Round Noise Action Plan.

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The estimated population exposed to noise levels greater than 57dB L_{night} for major roads within the Action Plan Area is estimated to be of the order of 5,831. In the First Round Noise action plan the figure identified was 1,334 people. However there is no direct correlation for a noise level of 57 dB as it falls within the 55 to 59dB noise band. The fact that the calculations are based on a variety of factors and are logarithmically calculated means that simple iteration of the 55-59 dB noise bands is unlikely to produce an accurate figure for noise above the 57dB level. The approach taken similar to the First Round Noise Action Plan is to simply assume that all noise in the 55 - 59dB noise band exceeds the threshold of 57dB. This approach means that the estimated figure of 5,831 should be considered to be a very conservative estimate.

Although the Second Round Noise Action Plan figures above indicate a significant increase in the numbers affected since the First Round Noise Action Plan, it is only reasonable to assume that the change in thresholds is the primary contributor to the changes to the exposure figures. It is not possible however to conclude that there has been no increase or otherwise of environmental noise. The extent of major road increased from approximately 24.3kms to 103kms as a result of the decrease in traffic volumes requiring assessment.

The mitigation measures applied will be to either reduce excessive sound levels or to preserve low noise levels where they exist.

Wicklow County Council has developed a detailed Programme of Works for the duration of the Noise Action Plan (2013 to 2018) and proposes to implement the programme subject to the availability of the requisite technical staff, expertise and financial resources.

A Draft of this Noise Action Plan 2013 was be put on public display at Wicklow County Council offices and made available in electronic format on the Wicklow County Council website. The Draft Noise Action Plan 2013 was also forwarded for review and comment to relevant stakeholders. The results of the stakeholder and public participation were taken into account when preparing the final document and the public will be informed of the decisions taken.

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The Draft Noise Action Plan 2013 was available to be inspected at the following locations during normal opening hours i.e. 9.00am to 5.00pm, Monday to Friday (excluding public holidays) from the 26th June 2013 to 12th July 2013.

Wicklow County Council	Bray Town Council	Arklow Town Council	Wicklow Town Council
County Buildings, Whitegates, Wicklow, Co. Wicklow	Civic Offices, Main Street, Bray, Co. Wicklow	Avoca River House, Bridgewater Centre, Arklow, Co. Wicklow	Town Hall, Market Square, Wicklow, Co. Wicklow

Any submissions or observations in relation to the Draft Noise Action Plan could have been made in writing to,

The Senior Executive Officer,
Roads and Transportation,
Wicklow County Council,
Whitegates, Cill Mhantáin,
Co. Wicklow

or may be made by email to noiseplan@wicklowcoco.ie within the period from 26th June 2013 to 12th July 2013.

Submissions were to be clearly marked “**Draft Noise Action Plan 2013**”. A notice was also placed in local newspapers inviting the public to submit their views on the Draft Noise Action Plan.

Wicklow County Council is subject to the provisions of the Freedom of Information (FOI) Act 1997 and the Freedom of Information (Amendment) Act 2003. Wicklow County Council if subject to a Freedom of Information request under these Acts may have no option but to release the information in accordance with the requirements of the relevant legislation. Members of the General Public, Statutory Bodies and other Groups and Organisations

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should be aware of this fact in relation to any submissions or observations made in relation to participation in the consultation phase of the Draft Noise Action Plan 2013.

No Submissions were made from the public or other bodies consulted within the consultation period.

One letter from an environmental consultancy firm (seeking to assist in implementing the Action Plan) and one telephone call from a member of the public living along the N11 (requesting action in relation to road noise) were received after the consultation period. Also after the consultation period an email was received from one of the bodies consulted (Dun Laoghaire County Council) noting they had no comments, while a letter was also received from the National Roads Authority clarifying their role in the Noise Mapping process.

The Final Noise action Plan was amended to reflect these contributions.

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1 INTRODUCTION

1.1 Background

This Second Noise Action Plan has been developed by Wicklow County Council on behalf of the relevant Local Authorities within County Wicklow (Wicklow County Council, Bray, Arklow and Wicklow Town Councils) in their role as designated Action Planning Authorities under the Environmental Noise Regulations 2006, Statutory Instrument Number 140 of 2006 (the Regulations).

The aim of the Action Plan is to provide an overview of the requirements of the Regulations, to review the results of the strategic noise mapping within County Wicklow and to set out an approach to the strategic management and control of environmental noise until the implementation of the next round of strategic noise mapping and action planning in approximately five years time.

The Second Noise Action Plan is based on and follows the same approach as the first Noise Action Plan (2008) and follows the same basic format of the First Round Noise Action Plan which was prepared by the Consultancy White Young and Green on behalf of Wicklow County Council.

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

1.2 European Requirements for Noise Action Planning

In 2002, the European Union (EU) issued Directive (2002/49/EC) relating to the assessment and management of environmental noise. This Directive is more commonly referred to as the Environmental Noise Directive or END for short.

<http://www.environ.ie/en/Legislation/Environment/Miscellaneous/FileDownload,1318,en.pdf>

The aim of the EU Directive is

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“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 Action Plans is

“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.”

Therefore, the key requirements of the END can be set out in three key objectives as follows:

- i. Undertake strategic noise mapping to determine population exposure to environmental noise.
- ii. Ensure information on environmental noise and its effects are made available to the public.
- iii. Adopt Action Plans, based upon the noise-mapping results, with the objective of preventing and reducing environmental noise where necessary and to preserve environmental noise quality where it is good.

Therefore, the Action Plans must reduce the existing noise climate where necessary and protect the future noise climate.

1.3 National Requirement for Noise Action Planning

The EU END was transposed into National Law by the Environmental Noise Regulations 2006, SI No. 140 of 2006. The Regulations provide for the implementation of the EU END in Ireland in order to ensure that a common approach within the European Community is achieved to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise.

For the purposes of both the EU Directive and Irish Regulations, environmental noise is defined as

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“unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic and noise in agglomerations over a specified size.”

Types of noise not included in the regulations are noise that is caused by the exposed person, noise from domestic activities, noise created by neighbours, noise at workplaces or noise inside means of transport or due to military activities in military areas. The regulations specify the process to be followed in addressing environmental noise from transport sources, implemented over two rounds detailed as follows

Round One:

Noise mapping bodies were required to make strategic noise maps before the 30th June 2007 for the following:

- Major roads with >6 million vehicles per annum.
- Major railways with >60,000 trains per annum.
- Agglomerations with >250,000 inhabitants.
- Major airports with >50,000 movements per annum.

Noise Action Plans were prepared by action planning authorities, based on the results of the mapping process. The Environmental Protection Agency (EPA) is the national authority for the purposes of the regulations.

The fundamental objective of the action plans is the prevention and reduction of environmental noise.

Round Two:

The second round of the regulations provided for noise mapping bodies to make strategic noise maps before the 30th June 2012 for the following:

- Major roads (defined in the regulations as roads with > 3 million vehicles per annum).
- Major railways (defined as > 30,000 trains per annum).
- Agglomerations with > 100,000 inhabitants.
- Major airports with >50,000 movements per annum.

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In relation to the threshold assessment level for airports this has not changed for the second round of the Regulations. However, as the Regulations require that the noise maps are reviewed and revised every five years, any airports within the noise mapping and Action Planning areas are required to be reassessed to see if they require mapping due to a change in the number of movements at the airport.

Revised/amended action plans must be prepared on foot of the extended strategic noise maps, by 18th July 2013.

1.4 Roles & Responsibilities of the Designated Bodies

The Regulations (SI 140 of 2006) designate on certain state Agencies and Authorities roles and responsibilities in relation to implementing the Regulations. These include the Environmental Protection Agency, the National Roads Authority, certain Local Authorities, Iarnród Éireann (Irish Rail), the Railway Procurement Agency and certain Airport Authorities.

1.4.1 Environmental Protection Agency (EPA)

The EPA has a Regulatory role to

“exercise general supervision over the functions and actions of noise-mapping bodies and action planning authorities, and provide guidance or advice to such bodies and authorities, where necessary”.

The EPA was required to report to the European Commission (EC) relevant information on population exposure to noise by December 2008.

The mapping of major roads outside the agglomeration of Dublin was undertaken by the NRA and all sources within Dublin agglomeration were mapped by Dublin City Council (DCC) and Fingal County Council working in partnership with South Dublin and Dun Laoghaire Rathdown County Council.

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Using noise level results with population distribution information, obtained from census and Geodirectory data, the noise exposure of the population living within the assessment areas was estimated. This information was delivered to the EC in December 2008. The EPA was required to submit summaries of Action Plans, prepared by the relevant local authorities, to the European Commission no later than 18th January 2009.

In preparation for the second round of Noise Action Plans in 2013 and the second Noise Mapping exercise in 2012, the EPA as the regulatory agency engaged with the relevant noise action planning and noise mapping bodies from mid 2010. The initial emphasis was to identify the relevant major roads, railways, airports and agglomerations falling within the revised threshold levels. In 2011 (which was the assessment year) noise mapping bodies assessed and identified the relevant major roads. Also in 2011 the EPA, following representations from a number of noise mapping bodies promoted the concept of a centralised approach for the noise map modelling of relevant major roads which were not national roads (i.e. Regional and Local Roads). This centralised noise map modelling approach for non national major roads was passed from the EPA to Kildare County Council in late 2011. Kildare County Council subsequently managed this centralised approach for the duration of the noise mapping exercise. The relevant major non national roads were mapped by the NRA following the provision of “model ready” data from the participating local authorities.

In December 2012 the EPA reported the results of the second round of noise mapping to the EC in accordance with the timetable. In March 2013 the EPA requested action planning authorities to submit draft noise action plans for review. Action planning authorities are required to submit completed plans to the EPA by the 18th July 2013, prior to the EPA submitting the action plan summaries to the European Commission on the 18th January 2014. The EPA timetable for noise action planning for the third and subsequent rounds then continues on a cyclical basis for every five years thereafter.

The Action Planning Body (Wicklow County Council) is also required to review and revise the noise maps if necessary periodically and whenever a major development occurs affecting the existing noise climate.

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1.4.2 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 Dun 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), the National Roads Authority, 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.

1.4.3 Responsibilities

The relevant noise mapping bodies were required by the 30th of June 2007 to produce strategic noise maps, 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 trains per year; and
- Any major airport.

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

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- An agglomeration with more than 100,000 inhabitants;
- A major road; and
- A major railway
- Any major airport

A major road is defined as any motorway, national or regional road with more than 3 million vehicle passages per year (or for ease of reference exceeding 8,220 vehicles per day).

A major railway is any railway with more than 30,000 passages per year.

The noise mapping bodies are required by the Regulations to repeat the 2012 strategic noise mapping exercise in five years time and at intervals of five years thereafter.

1.4.4 National Roads Authority (NRA)

The relevant Local Authorities and the NRA are jointly responsible for strategic noise mapping of major roads as defined in the Regulations. The NRA undertook noise mapping of national major roads, and non-national major roads on behalf of the Local Authorities outside the Dublin agglomeration as part of the first round of Noise Mapping in 2007. The National Roads Authority was established as an independent statutory body under the Roads Act, 1993. The Authority's primary function, under the Roads Act 1993, is

“to secure the provision of a safe and efficient network of national roads”.

For this purpose, it has overall responsibility for planning and supervision of construction and maintenance works on national primary and national secondary roads.

In 2011 (which was the assessment year) the NRA as the designated noise mapping body for National major roads assessed the extent of the national road network falling within the second round revised threshold levels. In 2012 the NRA modelled the relevant sections of the national road network falling within the requirements of the Regulations. As detailed earlier the EPA and Kildare County Council facilitated the implementation of a centralised approach for a central body

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to carry out the noise map modelling of the Regional and Local Major Roads as defined by the Regulations which were to be mapped and modelled by the individual noise mapping bodies (i.e. the local road authorities). Once the relevant “model ready” data was submitted the NRA undertook the noise map modelling on behalf of the relevant noise mapping bodies for regional and local roads. The completed second round noise maps were forwarded to the relevant roads authorities in mid 2012.

1.4.5 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 Councils are designated as the Action Planning Authorities for all sections of major roads within the functional areas of the Councils which experience a volume of traffic greater than 3 million vehicle passages per year. While the source of environmental noise for a large number of Councils will be only from major roads, a limited number of Councils will be subject to environmental noise from other sources, such as major railways and major airports, which qualify for noise mapping or inclusion in the action planning process.

Action planning authorities are required to ensure that:

- the public are consulted on proposals for action plans;

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- the public are given early and effective opportunities to participate in the preparation and review of action plans;
- the results of public participation are taken into account in finalising action plans or reviews of action plans;
- the public are informed of the decisions taken in relation to action plans;

Reasonable time-frames are adopted to allow sufficient time for each stage of public participation. Summaries of the Action Plans are to be submitted to the EPA by 18 July 2013. As with the strategic noise maps, the Action Plans are to be reviewed at least every 5 years after the date of their approval.

1.4.6 Wicklow County Council

Wicklow County Council is the designated body for the preparation of a Noise Action Plan for the roads within County Wicklow which have traffic levels of more than 3 million vehicles per year. Wicklow County Council is also the designated noise mapping body for non-national roads within County Wicklow which have a traffic flow above the major roads flow threshold. A map of the Action Planning Area is included in Appendix B.

1.5 Key Phases

1.5.1 Identification of Areas to be Mapped

In Wicklow, strategic noise maps and associated action plans were prepared for major roads only, for the first round of the Environmental Noise Regulations 2006. The requirement for noise action plans for railways, major airports or agglomerations did not apply in County Wicklow.

The definition of a major road for the first noise mapping/action planning round of the Regulations is a road with more than 6 million vehicles per annum. The roads identified as major roads in county Wicklow were:

- N11 From County Boundary with Dun Laoghaire Rathdown north of Bray to north of Ashford (approximately 20.5kms)

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- R750 from the junction with the R772 in Rathnew to the junction with the L5099 (Rocky Road) in Wicklow Town (approximately 2.8kms)
- R761 from the junction with the R918 (Upper Dargle Road) to the junction with the R767 (Killarney Road) along Castle Street and Main Street in Bray (approximately 1km)

Under the second round of the regulations noise mapping bodies were required to make strategic noise maps before the 30th June 2012 for the following:

- Major roads (defined in the regulations as roads with > 3 million vehicles per annum).
- Major railways (defined as > 30,000 trains per annum).

1.5.2 Preparation of Strategic Noise Maps

The purpose of the strategic noise maps is to identify the areas affected by different levels of environmental noise from major roads, railways, airports and agglomerations as described above. The maps are a visual representation of estimated noise contour bands within the action plan area from 55dB L_{den} to greater than 75dB L_{den} , in 5dB bands, and from 50dB L_{night} to greater than 70dB L_{night} , in 5dB bands. The maps have been linked to population data to estimate the number of people located in each environmental noise band. This information is then used to produce noise action plans, which will endeavour to manage existing environmental noise from the major sources and protect the future noise environment.

For the first phase of implementation of the Regulations, the NRA prepared strategic noise maps for all major roads in the country, including national and non-national roads with more than 6 million vehicles per annum. The roads listed under 1.5.1 above were identified as the only major roads in County Wicklow with more than 6 million vehicles per annum.

In early 2011 the NRA as the noise mapping body with responsibility for national roads falling within the revised thresholds of the Regulations (i.e. in excess of 3 million vehicles per annum or 8,220 vehicles per day) identified the extent of national roads falling within the remit of the Regulations. These are detailed in Table 1.1.

Table 1.1 – National Major Roads identified in County Wicklow

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Road	From	To	Max AADT	Length (Kms) Approx
M11/N11	DLRCC County Boundary at Fassaroe	WXCC County Boundary at Cooladangan	67,000	54.0
N81	SDCC County Boundary at Moanspick	Junction with R758 (Valleymount)	13,000	11.0
		Total National Major Roads		65

In late 2011 Wicklow County Council undertook an exercise to survey all major non national roads in order to identify the extent of roads falling within the remit of the revised thresholds of the Regulations (i.e. in excess of 3 million vehicles per annum or 8,220 vehicles per day). A total of 8 non national major roads were identified amounting to a total of 38kms. The extents of these roads are detailed in Table 1.2

Table 1.2 –Non National Major Roads identified in County Wicklow

Road	From	To	Max AADT	Length (Kms) Approx
R772	M11 Junction 20 (Arklow North)	M11 Junction 21 (Arklow South)	14,383	6.9
R772	M11 Junction 16 (Wicklow North)	Junction with R750 in Rathnew	15,316	1.1
R750	Junction with R750 (Rathnew Village)	South end of Wicklow Town 50pkh zone on R750	14,747	5.7
R761	DLRCC County Boundary north of Bray at Old Connaght	South end of Kilcoole 50pkh zone at Woodstock on R761	16,869	14.0
R762	Junction with R761 at Blacklion, north of Greystones	Mill Road Roundabout south of Greystones on R762	12,452	2.5
R767	N11 Junction 7 (Bray South / Greystones North)	Junction with R761 at south end of Main Street, Bray	9,939	2.6
R768	N11 Junction 7 (Bray South / Greystones North)	Junction with R761 at Windgates Roundabout, south of Bray	13,416	2.8
R774	N11 Junction 11 (Greystones South)	Junction with R761 at Prettybush Roundabout south of Greystones	13,059	2.4
		Total Non National Major Roads		38

After identification of the extent of areas requiring mapping, mapping was undertaken as detailed in Section 5

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2 EXISTING NOISE MANAGEMENT LEGISLATION & GUIDANCE

As stated above, in 2002, the European Union issued Directive (2002/49/EC), known as the Environmental Noise Directive or END, relating to the assessment and management of environmental noise. 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”.

Other international and national legislation also aims to reduce the impact of noisy activities on the receiving environment. Examples of the most relevant such legislation in Ireland is outlined below.

2.1 National Legislation or Guidance

The Wicklow Noise Action Plan has been prepared in accordance with the Environmental Noise Regulations 2006, the EPA Guidance Note on Noise Action Planning July 2009 and the EPA Guidance Note for Strategic Noise Mapping (Version 2) August 2011.

2.1.1 Environmental Protection Agency Act 1992

It is considered appropriate that all Action Planning Authorities should include a policy statement regarding their aims and objectives when utilising the provisions within the EPA Act. This will help to promote implementation of the Act.

The implementation of the EPA Act as it applies to County Wicklow is discussed in greater detail in Section 2.2 which deals with Regional and Local Legislation and Guidance. 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 are summarised in Table 2.1.

Table 2.1 Environmental Protection Agency Act 1992 (Relevant Sections)

Section	Details
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 National Roads Authority (NRA)

The National Roads Authority (NRA) has published “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. While no specific limits are set, the NRA Guidelines for the design of new national roads indicates that mitigation measures should be considered above a “design goal” level of 60dB L_{den} free-field. The guidelines also 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. However the values are only indicative and in certain circumstances it may be more appropriate to apply more stringent limits.

2.1.3 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.

2.1.4 Building Regulations

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Building Regulations were initially introduced in Ireland in 1991 on a formal footing to standardise the construction of buildings within the state. The Building Regulations have since their initial introduction been substantially revised to take cognisance of developments in building technology since their initial introduction.

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

2.1.5 Integrated Pollution Prevention & Control (IPPC) and Waste Licensing

Certain activities that are required to be licensed may be subject to noise conditions. The relevant guidance is set out in the April 2012 EPA publication "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*" which superseded the previous EPA publication "*Guidance Note for Noise in Relation to Scheduled Activities*". The current guidance document contains suggested noise limits of 55dB(A) L_{Aeq} for daytime and 45dB(A) L_{Aeq} , 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.

2.1.6 Wind Energy Planning Guidelines

This is a DoEHLG document dealing specifically with wind energy developments. Noise levels from wind farms are generally expressed in terms of the L_{A90} 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.

2.1.7 Quarrying & Ancillary Activities Guidelines for Planning Authorities

This EPA 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 (Lin) max. peak with a 95% confidence limit*”. 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.

2.1.8 National Planning Guidance

In the UK the National Planning Policy Frameworks (NPPF) which was published in March 2012 by the UK Department for Communities and Local Government provide guidance to local authorities in England on the use of their planning powers to minimise the adverse impact of noise. Section 11 dealing with “*Conserving and enhancing the natural environment*” is of particular reference. The National Planning Policy Frameworks (NPPF) supersedes the previous UK publication Planning Policy Guidance 24 (PPG24- October 1994) which has been withdrawn.

In Ireland with the exception of guidance documents referred to elsewhere in Section 2.1 no comparable document exists to guide Planning Authorities in Ireland. Planning Authorities do however have within their remit the power to impose conditions relating to noise (levels and or mitigation) as part of a decision on a proposed development application.

The Department of the Environment, Heritage and Local Government (DoEHLG) 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

Wicklow County Council Noise Action Plan 2013

Sustainable Residential Development in Urban Areas: Guidelines for Planning Authorities, December 2008

Urban Design Manual: A best practice guide (A companion document to the Draft Planning Guidelines on Sustainable Residential Development in Urban Areas), February 2008.

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

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

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

2.2 Regional and Local Legislation or Guidance

Generally Wicklow County Council uses national legislation and guidance as well as locally prepared Development Plans to address noise. In a Regional context County Wicklow forms part of the Greater Dublin Area which includes the Local Authorities included in the Dublin Regional Authority and Mid Eastern Regional Authority. There are a number of relevant policy objectives and guidance documents which are relevant within the context of noise action planning. These are briefly reviewed below.

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Wicklow County Council has regard to the 'Regional Planning Guidelines for the Greater Dublin Region'. It seeks to influence county wide the impact of noise through the Wicklow County Development Plan 2010-2016 and over a more limited area geographically through Local Area Plans and Action Area Plans.

2.2.1 Regional Guidance

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

"In relation to protecting the environment, the guidelines recommend that planning authorities give careful consideration to the ambient noise climate prior to the approval of noise sensitive developments. In a consideration of current trends, it notes that continuing reliance on private transport will result in greater exposure to noise. In relation to Strategic Environmental Assessments, it seeks to improve the health and well being of the population through the creation of a safe, healthy and high quality environment and has as a target reducing population exposure to high levels of noise and vibration".

2.2.2 Wicklow County Council County Development Plan 2010-2016

The Wicklow County Council County Development Plan 2010-2016 recognized the increasing relevance of noise in a planning context in County Wicklow. This was highlighted in the identified Objectives listed in Table 2.2.

Table 2.2 Relevant County Development Plan 2010-2016 Objectives

Chapter	Title	Objective
11	Roads and Transportation	NR6
13	Waste and Environmental Emissions	NP1, NP2, NP3 & NP4
14	Energy and Telecommunications	WE1

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In relation to Roads and Transportation the requirement to plan for noise is highlighted by National Roads Objective NR6 which states:

“To ensure that all new developments in proximity to National Routes provide suitable protection against traffic noise in compliance with S.I. 140 of 2006 Environmental Noise Regulations and any subsequent amendments to these regulations.”

The chapter on Waste and Environmental Emissions identified Noise Pollution as an issue in section 13.6. Four Noise Pollution Objectives were detailed as follows

“NP1 - To enforce, where applicable, the provisions of the Environmental Protection Agency (EPA) Acts 1992 and 2003, and EPA Noise Regulations 2004.”

“NP2 – To regulate and control activities likely to give rise to excessive noise (other than those activities which are regulated by the EPA).”

“NP3 – To require proposals for new developments with the potential to create excessive noise to prepare a construction and/or operation management plans to control such emissions.”

“NP4 – To require activities likely to give rise to excessive noise to install noise mitigation measures and monitors. The provisions of a noise audit may also be required as appropriate.”

The chapter on Energy and Telecommunications in Section 14.3 which deals with energy identified in the sub section on Wind Energy, Objective WE1 which states:

“To encourage the development of wind energy in accordance with the County Wicklow Wind Strategy and in particular to allow wind energy exploitation in most locations in the County subject to:

consideration of any designated nature conservation areas (SACs, NHAs, SPAs etc) and any associated buffers

impacts on visual, residential and recreational amenity

impacts on ‘material assets’ such as towns, infrastructure and heritage sites

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consideration of land cover and land uses on or adjacent to the site

consideration of grid connection issues

best practice in the design and siting of wind turbines, and all ancillary works including access roads and overhead cables.”

2.2.3 Local Town and Environs Development Plans

In addition to the Wicklow County Council County Development Plan 2010-2016 a number of the large Urban areas and Environs have their own Development Plans. These Urban and Environs Development Plans which are at various stages in their life cycles are fundamentally similar to the County Development Plan 2010-2016 in terms of objective in relation to noise in the planning context.

2.2.4 Wicklow County Council Wind Energy Strategy

A complimentary document to the Wicklow County Council County Development Plan 2010-2016 is the “Wicklow County Council Wind Energy Strategy” which is one of the Appendices of the Development Plan. The Wind Energy Strategy identifies areas of the county suitable for the development of Wind Energy developments based on wind speeds, visual amenity, and other planning issues. The strategy also outlines the assessment criteria used in considering applications for Wind Energy developments and noise is included as one of the assessment criteria.

It is recommended in the Wind Energy Strategy that in assessing noise impacts that reference is made to Section 5.6 of the DoEHLG document “Wind Energy Guidelines 2006”. The Wind Energy Strategy identifies that peripheral areas of the county may be suitable locations for potential Wind Energy Developments subject to adhering to the strategy Assessment criteria.

3 DESCRIPTION OF THE ACTION PLANNING AREA

3.1 County Wicklow

County Wicklow lies on the eastern seaboard of Ireland immediately to the south of the Dublin Agglomeration and is bounded to the east by the Irish Sea and to the west and south by the predominantly rural counties of Kildare, Carlow and Wexford.

3.2 Geography and Topography of County Wicklow

County Wicklow covers a geographical area of 2,024 square kilometres with 66 kilometres of coastline. The county contains a range of landforms and land uses, from rural lowlands to the south and west to the spine of mountains dividing the county from north to south, to the coastline on the Irish Sea to the east. The larger population centres are concentrated along the eastern coastlines with a pronounced concentration towards the north eastern corner of the county which is close to the major population centres in the Dublin Agglomeration.

3.3 Population of County Wicklow

The population of County Wicklow at the 2011 census was 136,640 which was an overall increase on 10,446 on the 2006 census population of 126,194. This equates to an overall population increase of 8.3% for the county over the period. All of the main towns in the county are located along the eastern coastline with the exception of Blessington and Baltinglass on the N81 in the west of the county.

The largest urban centre is Bray (pop. 31,872 which decreased by 0.1% on the 2006 census of 31,901) located on the northern county border with Dun Laoghaire Rathdown. Other main towns include Greystones (pop. 17,468 which experienced a significant increase of 19.9% on the 2006 figure of 14,569), Arklow (pop. 13,009, an increase of 10.6% from the figure of 11,749 in 2006) and Wicklow Town (pop. 10,356 which had a modest increase of 2.8% on the 2006 figure of 10,070). Other select population centres in Wicklow which experienced significant growth in population in the period were Rathnew (pop. 2,964 up by 60.3%) between the M11 and Wicklow

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Town, Kilcoole (pop. 4,049 up by 24.5%) located immediately to the south of Greystones. The two towns on the N81 also experienced similar population growths with Blessington rising by 24.7% to a population of 5,010 and Baltinglass rising by 18.8% to 2,061. The village of Kilmacanoge is located on the N11 at Junction 8 to the south west of Bray. However as the village is located within a large rural area it has not been possible to extract the population data for the village. A map of the extents of County Wicklow showing the major centres of population is included in Appendix B.

3.4 Transport Infrastructure within County Wicklow

3.4.1 Road Network

There are approximately 2,400 kilometres of public roads within the charge of Wicklow County Council. These consist of 92 kilometres of national roads, 422 kilometres of regional roads and 1,886 kilometres of local roads. There are two national routes, M11/N11 (54 Km) and N81 (38 Km) in the county.

The N81 is classified as a National Secondary Route and is a single carriageway road along its entire length. The road runs on a north to south axis linking the population centres of Blessington and Baltinglass in west Wicklow (west of the Wicklow Mountains) with Dublin to the north and Tullow and Enniscorthy to the south. Some sections of the N81 have been improved by widening over the years, however some sections without hard shoulders remain on the route.

The M11/N11 National Primary route forms part of the Trans European Route E01. The capacity of the road has been gradually upgraded since the 1960's in various stages. These initially included road widening to dual carriageway with at grade junction arrangements, followed by the by-passing of population centres by dual carriageways with grade separated junctions on new alignments. Some sections of these by-passes have been upgraded to Motorway status which now accounts for 15.5 kms of the route. The remaining improved dualled sections of the route account for 23.5 kms. The balance of the N11 which equates to 15 kms remains at single carriageway alignment. This includes sections without hard shoulders. Construction has commenced on by-passing this last remaining section of the N11 single carriageway and works are due to be completed by the end of 2015.

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The majority of the road length in County Wicklow (95%) is made up of regional and local roads, a reflection of the predominantly rural nature of the county.

The Noise Action Plan applies, to the areas adjacent to roads in county Wicklow, which experience traffic volumes in excess 3 million vehicles a year as defined in the Regulations. Noise Maps have been prepared for all roads deemed to fall within the qualifying threshold of 3 million vehicles a year (approx 8,250 AADT) as detailed in Table 3.1 and shown on the Maps in Appendix C.

Table 3.1 – Major Roads for the purposes of the Regulation in County Wicklow

Road	From	To	Max AADT	Length (Kms) Approx
M11/N11	DLRCC County Boundary at Fassaroe	WXCC County Boundary at Cooladangan	67,000	54.0
N81	SDCC County Boundary at Moanspick	Junction with R758 (Valleymount)	13,000	11.0
		Total National Major Roads		65
R772	M11 Junction 20 (Arklow North)	M11 Junction 21 (Arklow South)	14,383	6.9
R772	M11 Junction 16 (Wicklow North)	Junction with R750 in Rathnew	15,316	1.1
R750	Junction with R750 (Rathnew Village)	South end of Wicklow Town 50pkh zone on R750	14,747	5.7
R761	DLRCC County Boundary north of Bray at Old Connaght	South end of Kilcoole 50pkh zone at Woodstock on R761	16,869	14.0
R762	Junction with R761 at Blacklion, north of Greystones	Mill Road Roundabout south of Greystones on R762	12,452	2.5
R767	N11 Junction 7 (Bray South / Greystones North)	Junction with R761 at south end of Main Street, Bray	9,939	2.6
R768	N11 Junction 7 (Bray South / Greystones North)	Junction with R761 at Windgates Roundabout, south of Bray	13,416	2.8
R774	N11 Junction 11 (Greystones South)	Junction with R761 at Prettybush Roundabout south of Greystones	13,059	2.4
		Total Non National Major Roads		38
		Total All Major Roads		103

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Note: The N81 south of the junction with the R758 (Valleymount Road) is not within the threshold of 3 million vehicles a year (approx 8,250 AADT).

3.4.2 Rail Network

The only railway network located in County Wicklow is the Dublin Connolly to Rosslare Europort Intercity Service which connects the county with other transport nodes located in Dublin and Dun Laoghaire to the north and Rosslare Europort to the south. The service connects with varying levels of frequency the population centres of Bray, Greystones, Kilcoole, Newcastle, Wicklow, Rathdrum and Arklow in the county.

In addition Iarnród Éireann, operate the electricified DART rail service from Greystones and Bray to the centre of Dublin city and beyond. The railway line consists of twin tracks from Dublin city to just south of Bray station (before Putland Road) where the line reverts to a single track as far as its terminus in Rosslare Europort. As a consequence, this is one of the reasons that the frequency of the DART service to Greystones is lower than to Bray.

Discussions with Iarnród Éireann, indicate that the rail network as far as the end of the twin rail tracks south of Bray Station (before Putland Road) falls within the threshold for assessment required under the Regulations (in excess of the 30,000 passages per annum). As the majority of the railway line affected is located within the Dublin Agglomeration to the north of Bray, Iarnród Éireann carried out an assessment of the environmental noise impact for the railway noise on this line within the assessment of the agglomeration area. As a consequence it is not possible to filter out the populace affected by environmental noise from railway lines in County Wicklow. However comparing the relative length of railway network affected (approximately 1.6 kms) with the road network affected (103 kms), road generated environmental noise is the overwhelming environmental noise in County Wicklow.

3.5 *Extent of the Action Planning Area*

The action planning area includes lands on both sides of the above referenced roads and the railway network affected. The boundary of the lands is not defined by distance from the major

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noise source but rather it is the land area defined by computer modelling to be affected by noise levels of greater than 50dB(A) L_{night} and/or 55dB(A) L_{den} .

In County Wicklow the total length of identified major roads included within the strategic noise mapping was 103 km which amounts to under 5% of the total road network which is reasonable considering the proximity to a major agglomeration area. The lengths of roads by category are detailed in Table 3.1 above.

Iarnród Éireann identified one section of major rail on the Dublin to Rosslare Europort Line which is 1.6kms in length between the boundary with Dun Laoghaire Rathdown County Council and the end of twin tracks at Putland Road south of Bray Station. Iarnród Éireann developed the Noise Mapping for this section of railway and included the results in the noise mapping for the Dublin Agglomeration. Appendix D includes maps which show the extent of the areas of strategic noise mapping arising from rail traffic for the Dublin Agglomeration.

In Late 2011 / Early 2012, following consultation with Responsible Action Planning Authorities agreement was reached to centrally map all major (Non National) roads falling outside the remit of the National Roads Authority. This centralised approach was facilitated through the auspices of the CCMA with Kildare County Council acting as the lead authority in order to obtain the relevant noise mapping services on behalf of the participating authorities. Wicklow County Council participated in this process in order to effectively complete the required noise mapping for non national major roads in County Wicklow. The mapping for these roads was carried out through the agreed centralised approach by the NRA.

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4 RESPONSIBLE AUTHORITY FOR ACTION PLANNING

In County Wicklow, the noise sources to be considered by the Action Planning Authorities relate to major roads in excess of 3 million vehicle passages per year, as defined in the Regulations. Parts of the functional area of Wicklow County Council and Bray, Arklow and Wicklow Town Councils are also affected by the noise from these roads and therefore, all authorities are considered designated action planning authorities.

4.1 Contact Details for the Responsible Action Planning Authorities

The following are the contact details for the responsible authorities:

Wicklow County Council	Bray Town Council	Arklow Town Council	Wicklow Town Council
County Buildings, Whitegates, Wicklow, Co. Wicklow	Civic Offices, Main Street, Bray, Co. Wicklow	Avoca River House, Bridgewater Centre, Arklow, Co. Wicklow	Town Hall, Market Square, Wicklow, Co. Wicklow
Phone: 0404 20100	Phone: 01 2744900	Phone: 0402-32819	Phone: 0404-67327
Fax: 0404 67792	Fax: 01 2860930	Fax: 0402-39773	Fax: 0404-69158
Email:	Email:	Email:	Email:
cosec@wicklowcoco.ie	tclerk@braytc.ie	tclerk@arklowtc.ie	tclerk@wicklowtc.ie

Wicklow County Council is the Lead Authority in developing the Noise Action Plan. Any communication in relation to the Noise Action Plan should be addressed to:

Senior Executive Officer,
Roads and Transportation Department,
Wicklow County Council
Telephone: 0404 20100
Fax: 0404 67792
Email: noiseplan@wicklowcoco.ie
Webside: wicklow.ie

4.2 Description of other bodies of relevance.

The EPA is an independent public body established under the Environmental Protection Agency Act, 1992. The EPA is the national authority for the purposes of the Environmental Noise Regulations 2006.

The Regulations require the NRA 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 relevant non national major road lies.

In Late 2011 / Early 2012, following consultation with Responsible Action Planning Authorities agreement was reached to centrally map all major (Non National) roads falling outside the remit of the National Roads Authority. This centralised approach was facilitated through the auspices of the CCMA with Kildare County Council acting as the lead authority in order to obtain the relevant noise mapping services on behalf of the participating authorities. Wicklow County Council participated in this process in order to effectively complete the required noise mapping for non national major roads in County Wicklow. The mapping for these roads was carried out through the agreed centralised approach by the NRA.

4.3 Description of noise reduction measures already in place.

The most significant major road in County Wicklow is the M11/N11 which links the major towns along the eastern coastline of the county. Enhancements to this road have been ongoing since the late 1960's when the first section of dual carriageway was constructed. In the intervening years the road has undergone continuous up-grading to the point that the last remaining 15 kilometres single carriageway section will be decommissioned in late 2015 by the Rathnew to Arklow Road Improvement Scheme which has just commenced construction. While early improvement schemes on the M11/N11 did not envisage the volumes of traffic now experienced along the route, sections of the M11/N11 completed in recent years, have to varying extents, as part of the Environmental Assessment considered the effects of noise for the relevant schemes and included noise mitigation measures as part of the schemes. This mitigation measures

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consisted mainly of noise barriers (proprietary or masonry walling), earth bunding and to some extent vegetative screening. The schemes were designed to the relevant national road design guidelines in place at the time the schemes were designed to minimise impact on existing residential amenity. The following is a non exhaustive list of road schemes with some level of noise assessment and/or mitigation measures included as part of the scheme.

Scheme Name	Year Completed	Length
<i>N11 Rathnew to Arklow</i>	<i>At Construction</i>	<i>15km</i>
<i>Wicklow Port Access and Town Relief Road</i>	<i>2011</i>	<i>7km</i>
N11 Kilpedder Interchange (Junction 11)	2008	2km
<i>R774 Greystones Southern Access Road</i>	<i>2006</i>	<i>6km</i>
N11 (M11) Newtownmountkenedy to Ballynabarny (N11 Ashford and Rathnew By-Pass)	2006	13km
<i>N11 Kilmacanoge to Glen of the Downs</i>	<i>2003</i>	<i>5km</i>

Reduced speed limits in the centres of urban population on the N11, N81 and the major non national roads while primarily designed to improve road safety for motorists and pedestrians in high conflict locations have to some extent resulted in a reduction of traffic noise due to the reduction in traffic speeds.

The N11 Rathnew to Arklow Road Improvement Scheme which is currently at construction has included for the implementation of appropriate noise mitigation measures as identified in the Environmental Impact Assessment for the scheme where deemed necessary.

The N11 Kilmacanoge to Glen of the Downs Road Improvement Scheme when it was originally constructed in 2002 used a Stone Mastic Asphalt (SMA) surfacing course as opposed to the more durable and traditional Hot Rolled Asphalt (HRA) surfacing course to reduce road noise in

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Kilmacanoge village and in the Glen of the Downs. This material has been moderately successful in reducing noise but the road surface is starting to deteriorate rapidly with the formation of potholes, while older sections of Hot Rolled Asphalt pavement have not deteriorated at a similar rate.

5 SUMMARY OF NOISE MAPPING RESULTS

5.1 Overview of the Preparation of the Strategic Noise Maps

The preparation of the Strategic Noise Maps required the assessment of a number of parameters in order to compile the data for entry into the modelling software. These are broken down into three distinct areas

Roads Data

Buildings Data

Contour Data

The completed datasets were mapped using MapInfo software before being converted into Shape files for running in the modelling software. The details of the data included in the various datasets are discussed in more detail in sub sections 5.1.1, 5.1.2 and 5.1.3.

5.1.1 Roads Data

The Roads data was the most varied of the datasets to compile as the data required a mixture of on site assessment as well as examining pavement conditions, paving materials, stated speed limit, etc. A number of weekday traffic counts were undertaken in November and December of 2011 to assess the traffic flow volumes (AADT) and percentage of Heavy Goods Vehicles (HGV's) on each individual segment assessed. These traffic counts were undertaken using AT-SR4 Radar Traffic Counter boxes which collected traffic volumes, percentage of HGV's and traffic speeds and extracted the data using Sierzega traffic counter software.

The individual road segments with the relevant background data were mapped in MapInfo before being converted into Shape files for the NRA to run in the modelling software. The data compiled for each road segment is defined in Table 5.1

Table 5.1 – Major Roads Dataset Information Requirements

Parameter	Details
Road	Name of Road – i.e. Road Number used within Ireland to reference the road.
Traf_AADT	Annual Average Daily Traffic Count
CRTN_18Hr	18 Hour traffic Count - Derived from AADT figure using NRA Guidelines (specific to national roads) or Directly from Traffic Counter data (i.e. between 06:00 to 24:00 hours)
VD	Speed [km/h] - Speed Limit on Road Segment
PHD	Percentage of HCVs [%] derived from Traffic Counter data
MTD	Mean Texture Depth [mm] - A standard texture depth of 1.5mm is assumed for all roads.
Surface	A standard asphalt surface type is assumed for all roads unless other wise known. 0 for Standard Asphalt; 1 for Bitumen; 2 for Concrete.
LowNoiseRd	Yes or No depending on presence of a low noise road surface
Gradient	Gradient of Road [%] – in direction of digitisation
RoadClass	0 for Non-Motorway; 1 for Motorway
Width	Road Width [m]
Direction	With/Against digitisation
MapYear	Year first mapped in accordance with END (2006 or 2011)
Notes	Any additional notes relevant to road section

5.1.2 Buildings Data

The data required for buildings was more generic and was generally the building height which was taken with a default of 8 metres high. The details of the locations of buildings along the relevant road segment corridors was extracted from up-to-date OSI Vector mapping data sets and each building was given a unique identifier code which contained the prefix WW for Wicklow.

5.1.3 Contour Data

The Contour Data was also obtained from OSI mapping. Initially in this process the OSI had in excess of 30kms of the relevant road corridors mapped with high quality LIDAR digital mapping.

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The modelling software required that contour datasets be interpolated at 1 metre intervals in order to accurately run the noise models.

However some portions of the R772 road corridor close to Arklow was not mapped and additional post processing was required to prepare the relevant LIDAR data. Again once Wicklow County Council received all the relevant contour data the contours were mapped in Mapinfo prior to conversion into Shape files.

5.1.4 Modelling Process

In Section 3.5 details of the approach taken by Noise Mapping Bodies to achieve economies of scale by centrally arranging noise modelling services was detailed. The process, which was facilitated through the auspices of the CCMA with Kildare County Council acting as the lead authority, resulted in the National Roads Authority modelling all non national major roads as defined by the Regulations for the participating Noise Mapping Bodies.

Once the relevant datasets were completed they were forwarded to the NRA to run the models in May 2012. The noise levels were assessed on a regular grid pattern across the model, and the results were used, with a model of estimated population distribution, to assess the numbers of people exposed. As with all modelling, the variations in the data parameters in the datasets, meant that the results provide a best assessment based on the input data, rather than a conclusive quantifiable output of data. The results do however provide pointers for future assessment of the location, magnitude and population affected by environmental noise.

5.2 Presentation of Strategic Noise Mapping Results

5.2.1 General

After completion of the Noise modelling process in 2012 the NRA forwarded the Strategic Noise Maps for Major Roads in County Wicklow to Wicklow County Council in October 2012. The Maps for Major Railways were received in April 2013. The maps detail the grids of noise level results, categorised into 5 dB wide noise level bands above 55 dB L_{den} and 50 dB L_{night} . These noise level bands are displayed as coloured areas on noise level maps, and used as the basis for statistical

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analysis to estimate the extent of exposed areas, and the number of exposed dwellings and number of exposed people. These statistical exposure results were submitted to the EC in December 2012 by the EPA. The colour coding of the noise exposure levels are in accordance with the recommendations in the EPA Guidelines for Noise Action Planning 2009.

5.2.2 Strategic Noise Maps

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

5.2.3 Exposure Statistics Summary - Major Roads

The details of the exposure statistics obtained for the major road network in County Wicklow has been received from the NRA with the Strategic Noise Maps for the Major Roads. The results are detailed as follows:

Table 5.2 Weighted 24 Hour Road Traffic Flow (L_{den}) - Estimated Number of Affected People in dB Bands and as Percentage of Overall Affected Population

Table 5.3 Weighted 24 Hour Road Traffic Flow (L_{den}) – Estimate of Area, No. of Dwellings and People in dB Bands

Table 5.4: Weighted 24 Hour Road Traffic Flow (L_{night}) - Estimated Number of Affected People in dB Bands and as Percentage of Overall Affected Population

Table 5.5: Weighted 24 Hour Road Traffic Flow (L_{night}) – Estimate of Area, Number of Dwellings and People in dB Bands

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Table 5.2: - Weighted 24 Hour Road Traffic Flow (L_{den}) Affected Population & Percentage of Affected Population.

L_{den} Noise Band	Approx Number of People Affected	Approx Number of People as % of Total Affected Population in Wicklow
<55 dB	57,555	76.1%
55-59 dB	8,158	10.9%
60-64 dB	5,013	6.6%
65-69 dB	3,943	5.2%
70-74 dB	927	1.2%
≥ 75 dB	50	0.0%
Total	75,646	100%

Table 5.3: - Weighted 24 Hour Road Traffic Flow (L_{den}) Area, Dwellings and People.

L_{den} Noise Band	Approx Area Km ²	Approx No. of Dwellings	Approx No. of People
>55 dB	53	7,043	18,091
>65 dB	13	2,113	4,920
>75 dB	2	16	50

Table 5.4: - Weighted 24 Hour Road Traffic Flow (L_{night}) – Affected Population & Percentage of Affected Population

L_{night} Noise Band	Approx No. of People Affected	Approx Number of People as % of Total Affected Population in Wicklow
<50 dB	64,342	85.1%
50-54 dB	5,473	7.2%
55-59 dB	4,502	6.0%
60-64 dB	1,206	1.6%
65-69 dB	123	0.1%
>70 dB	0	0.0%
Total	75,646	100%

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Table 5.5: - Weighted 24 Hour Road Traffic Flow (L_{night}) – Area, Dwellings and People

L_{night} Noise Band	Approx Area Km ²	Approx No. of Dwellings	Approx No. of People
>50 dB	33	4,500	11,304
>60 dB	7	588	1,329
>70 dB	0	0	0

5.2.4 Exposure Statistics Summary – Major Rail

In Section 3.4.2 the details of the extent of the Major Rail network in County Wicklow was identified as the section of twin railway line between the Dun Laoghaire Rathdown County Council County Border and the end of the twin tracks to the south of Bray Station (before Putland Road).

As also detailed in Section 3.4.2 Iarnród Éireann carried out an assessment of the environmental noise impact for the railway noise on this line within the Dublin Agglomeration to the north of Bray as the majority of the line and populace affected is located in the agglomeration area. As a consequence it is not possible to filter out the populace affected by environmental noise from the railway line in County Wicklow. However comparing the relative length of railway network affected with the road network affected road generated environmental noise is the overwhelming environmental noise in County Wicklow.

The Iarnród Éireann Strategic Noise Maps for the L_{den} and L_{night} for the Dublin Agglomeration are included in Appendix D for general information.

5.2.5 Exposure Statistics Summary – General Overview

The results clearly show that noise from road traffic, as opposed to rail, is the dominant source of noise affecting people in the Action Planning Area of County Wicklow.

5.3 Limitations of Strategic Noise Mapping Results

As with all assessments based on subjective datasets there are a number of limitations with the results of the Strategic Noise Mapping. These limitations which were identified in sub section 5.1.4 mean that the results provide a best assessment based on the input data rather than an inconclusive quantifiable output of data. The results do however provide pointers for future assessment of the location, magnitude and population affected by environmental noise. The limitations of the noise map results include the following.

The noise maps are generated using a computational noise prediction model using representative traffic flow data. Topographical data and existing buildings have been input into the noise prediction models. However, the effects of any existing noise mitigation measures already in place have not been considered.

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 adjacent to such busy roads, the maps may not always be fully representative of the precise noise climate at a specific location.

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6 IDENTIFICATION OF AREAS TO BE SUBJECT TO NOISE MANAGEMENT ACTIVITIES

6.1 General

Strategic noise maps provide a spatial indication of locations which may be subject to undesirably high levels of environmental noise. However, not all of these noise locations require priority action. Various factors must be taken into account when deciding if environmental noise management is necessary, such as the source of the noise and the actual noise level, the type of buildings and land use in the area.

At present there is no mandatory or statutory guidance in existing legislation that limits noise levels to a particular value, mainly due to the subjective nature of noise exposure and annoyance. The effect of noise exposure is 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.

To address the lack of legislative measures and unify the approach taken by Action Planning Authorities the EPA have issued guidelines for the assessment of noise exposure and prioritising areas for noise mitigation measures. The proposed onset of assessment levels relating to road traffic noise are given below.

Onset levels for assessment of Noise Mitigation measures:

70dB L_{den}

57dB L_{night}

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Onset levels for assessment of Noise level Preservation where they are good:

55dB L_{den}

45dB L_{night}

The value of 57dB L_{night} is considered as appropriate. However, as the noise maps are plotted in 5dB contour bands, it is difficult to identify and evaluate areas which are exposed to exactly 57dB or greater. Nonetheless, these values can be seen as indicative criteria in the decision making process. This value could be rounded up or down depending on the situation and the location of the exposed properties. 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. It is understood that the EPA are due to make available a 57dB L_{night} contour dataset which would make amendments to future noise action plans more straightforward.

The estimated population exposed to noise levels greater than 70dB L_{den} for major roads within the Action Plan Area equates to 977 people. This compares to a figure of 15 people in the First Round Noise Action Plan.

The estimated population exposed to noise levels greater than 57dB L_{night} for major roads within the Action Plan Area is estimated to be of the order of 5,831. In the First Round Noise action plan the figure identified was 1,334 people. However as detailed above there is no direct correlation for a noise level of 57dB as it falls within the 55 to 59dB noise band. The fact that the calculations are based on a variety of factors and are logarithmically calculated means that simple iteration of the 55-59dB noise bands is unlikely to produce an accurate figure for noise above the 57dB level. The approach taken similar to the First Round Noise action plan is to simply assume that all noise in the 55-59dB noise band exceeds the threshold of 57dB. This approach means that the estimated figure of 5,831 should be considered to be a very conservative estimate.

Although the Second Round Noise Action Plan figures above indicates a significant increase in the numbers affected since the First Round Noise Action Plan, it is only reasonable to assume, that the increase is primarily a result of the lowering of the threshold levels, resulting in a consequent increase in the extent of major roads included for assessment in the Second Round

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Action Plan. It is not possible however to conclude that there has been no increase or otherwise of environmental noise. The extent of major road increased from approximately 24.3kms to 103kms as a result of the decrease in traffic volumes requiring assessment.

6.2 Description of the Criteria/Decision Matrix to be used for the identification of areas qualifying for action

Implementation of the Environmental Noise regulations requires strategic mapping. Strategic noise maps provide an indication of which locations are subject to undesirably high levels of environmental noise. However, not all of these noisy areas 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 itself.

In order to focus resources on areas in most need of improvement, a decision support matrix (Prioritisation Support Tool) has been applied, based on work carried out by Dublin City Council for the Dublin Agglomeration Noise Action Plan. A decision support matrix is a chart that 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 assessing the relative importance of each.

For this Action Plan it is proposed that the higher the number achieved in the decision matrix process, the higher the priority for action. A total score of 17 or above in the 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 the support matrix allows for a more comprehensive evaluation of the impact of environmental noise pollution at a given location.

The decision support matrix is a support tool that will help Wicklow County Council to best determine what locations to prioritise first based not only on measured noise levels but also in terms of noise receptor sensitivity and noise type. The final matrix score is determined based on three variables, as follows;

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6.2.1 Environmental Noise Levels

The noise indicators L_{den} and L_{night} as set out respectively in Parts I and II of the First Schedule of the Environmental Noise Regulations, 2006, shall be used by noise-mapping bodies for the preparation or revision of strategic noise maps in accordance with Article 10. A standardised noise annoyance dose-response curve, similar to that contained in ISO 1996-1:2003 was used. The weighting factors for various noise exposure categories that will be used are:

Table 6.1 - Decision Matrix Criteria (Environmental Noise Levels)

Noise Band	Score Range L_{den}	Score Range L_{night}
<45 dB	5	6
45 - 49 dB	4	5
50 - 54 dB	3	4
55 - 59 dB	2	2
60 - 64 dB	1	3
65 - 69 dB	2	4
70 - 74 dB	3	5
75 - 79 dB	4	6
>80 dB	5	7

6.2.2 Location / Land Use

This score is assigned based on the type of land use in the area and on the receptor. A higher score is assigned to open countryside on the basis of the expectation that residences in open countryside will have lower ambient noise levels than commercial areas and town centres. A higher score is also assigned to noise sensitive locations because of the requirement for low noise levels for them to function effectively (e.g. schools, churches, funeral homes, hospitals, nursing homes).

Table 6.2 - Decision Matrix Criteria (Location/Land Use)

Location	Score Range L_{den}	Score Range L_{night}
Town Centre	1	1
Commercial	1	2
Residential	2	3
Noise Sensitive	3	3
Open Countryside	3	3
Recreational open space	2	2

6.2.3 Source Type

The type of noise source will be prioritised based on the following:

Table 6.3 - Decision Matrix Criteria (Source Type)

Source type	Score Range L_{den}	Score Range L_{night}
Air	3	4
Industry	2	3
Rail	2	3
Road	3	4

6.2.4 Complete Decision Matrix

The individual Decision Matrix Criteria as detailed in 6.2.1 to 6.2.3 above are combined to form a Complete Decision Matrix which allows the identification, analysis and rating of the strength of relationships between the various sets of information. It enables a number of different factors to be examined and facilitates assessing the relative importance of each.

It is proposed that the higher the number achieved in the decision matrix process, the higher the priority for action. A total score of 17 or above in the 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 the support matrix allows for a more comprehensive evaluation

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of the impact of environmental noise pollution at a given location. The Complete Decision Support Matrix is detailed in Table 6.4 below.

Table 6.4 - Decision Matrix Criteria (Location/Land Use)

Assessment Area		Score Range L_{den}	Score Range L_{night}	Sub total
Noise Band	<45 dB	5	6	
	45 - 49 dB	4	5	
	50 - 54 dB	3	4	
	55 - 59 dB	2	2	
	60 - 64 dB	1	3	
	65 - 69 dB	2	4	
	70 - 74 dB	3	5	
	75 - 79 dB	4	6	
	>80 dB	5	7	
Location	Town Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive	3	3	
	Open Countryside	3	3	
	Recreational open space	2	2	
Source Type	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
Priority: High, Medium or Low				

Note: A worked example of the Complete Decision Matrix is included in Appendix F.

6.3 Onset of Assessment Thresholds

The details of the Assessment Thresholds have been initially discussed in Section 6.1. In Section 6.2 details of the process to concentrate on areas to be assessed for possible mitigation measures has been described in detail.

As outlined in Section 6.1 the onset levels for assessment of Noise Mitigation measures are:

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

And the onset assessment levels for measures to Preserve the Existing Noise situation are:

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

The Strategic Noise Maps have identified the noise environment in proximity to the major sources of noise in the Action Planning Area in County Wicklow. There may be areas within the coverage of the Noise Maps (such as sporting fields and amenity areas) where it would be an ideal scenario to have a quiet noise environment. It is proposed that during the lifetime of the current Noise Action Plan that such areas would be identified (subject to the availability of resources and funding) so that the existing noise environment can be preserved below threshold levels. It should however be noted that noise levels in these areas could be elevated due to noise from sources not covered by the Regulations. This could include the likes of cheering at sporting events etc.

6.4 Approach to determine Quiet Areas in Agglomerations

The Regulations define “Quiet Area in an Agglomeration” as

“an area, delimited by an action planning authority following consultation with the Agency and approval by the Minister, where particular requirements on exposure to environmental noise shall apply”

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There are no relevant agglomerations in County Wicklow therefore there is no statutory requirement to identify quiet areas within County Wicklow.

6.5 Approach to determine Quiet Areas in Open Country

The Regulations define “Quiet Area in an Open Country” as

“an area, delimited by an action planning authority following consultation with the Agency and approval by the Minister, that is undisturbed by noise from traffic, industry or recreational activities”

By virtue of the fact that the Strategic Noise Maps identify areas subject to environmental noise it could be easily assumed that the balance of County Wicklow not covered by the Strategic Noise Maps could be classed as “Quiet Area”. However such a wide sweeping assessment by its nature would disregard other local factors which could affect the environmental noise within the assumed Quiet Areas. These factors could include existing industries, centres of population, geographical location, topography, economic asset (tourism / environmental) etc. Additionally these “Quiet Areas” are covered by a network of non-major roads (i.e. not covered by the requirements if the Regulations) connecting to the major roads. Traffic on these non -major roads will also have an influence on the noise levels in these areas.

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. Wicklow County Council as the Action Planning Authority may (subject to available funding and resources) during the lifetime of this Action Plan identify quiet areas in open countryside and undertake public consultation prior to any recommendation for approval by the Minister.

6.6 Application of the Criteria / Matrix

Wicklow County Council as the Action Planning Authority proposes to examine in detail the relevant Strategic Noise Maps to identify any noise sensitive locations situated within the action planning area. This will be achieved by superimposing the relevant Strategic Noise Maps (L_{den} and

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L_{night}) over detailed OSI background mapping and the Geodirectory to identify particular “hot spot” locations.

Any noise sensitive locations identified will then be tested against the Complete Decision Support Matrix to establish whether mitigation measures need to be carried out to improve or preserve the existing noise situation. As detailed in Section 6.2 a total score of 17 or above in the matrix indicates that the location in question should be included in a shortlist for further assessment.

6.7 Results of Analysis of the Data

During the lifetime of the current Noise Action Plan Wicklow County Council as the relevant Action Planning Authority proposes (on a phased basis) to undertake the relevant analysis of the noise data included in the Strategic Noise Maps. The phasing of this work will initially concentrate on the M11/N11 followed by the N81 and lastly the relevant major non national roads working north to south. It is proposed that this analysis will be fully completed by the end of the fourth year of the current Action Plan (2017).

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7 NOISE MITIGATION & PROTECTION MEASURES

7.1 General

The assessment of Noise Mitigation and Protection Measures in this section will be reviewed considering the extent of areas above, below or between the threshold levels. Further consideration will be given to financial considerations including budgetary restraints and value for money.

Wicklow County Council as the Noise Mapping Body and the Action Planning Authority will support and facilitate where, relevant, measures and programmes either locally initiated or nationally procured to improve the environmental noise environment in County Wicklow.

The general approach to be taken by Wicklow County Council to managing environmental noise in the Action Planning Area will seek to (where necessary):

Promote Noise reduction at source

Encourage Land use planning to comply with noise targets

Promote measures to reduce noise impacts

Issue operating restrictions to reduce noise emission.

7.2 Description of how Areas above onset of Assessment Criteria will be Processed

Areas above the threshold of assessment which have been identified by the Strategic Noise Mapping will be ranked according to the decision support matrix for further assessment subject to available funding. A programme for further assessment and the implementation of potential noise mitigation measures in these areas will be required.

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The first step will be to measure site noise levels. The subsequent order of priority will be reviewed based on these actual noise measurements. The noise model may over estimate the environmental noise levels resulting from road traffic at a particular location. Where the decision support matrix process identifies locations for further assessment, noise monitoring may be carried out to confirm that levels of environmental noise are unsatisfactory and if potential mitigation measures may be required. Noise monitoring may be carried out at a location that is representative of a number of the locations identified for further assessment which could reduce the number of noise monitoring locations required and consequently reduce the cost of monitoring.

The most appropriate and cost effective mitigation measures will be identified in order of effectiveness and priority.

When mitigation measures have been implemented at specific locations, further noise monitoring should be carried out (subject to available funding) after implementation in order to determine the effectiveness of the mitigation measures and to quantify the improvement achieved.

These studies and implementation of the mitigation measures may be undertaken over a number of years as the budget allocated to the noise mitigation programme allows.

7.3 Description of how Areas below protection Threshold will be Preserved

Future projects likely to have a noise impact on the areas below the protection thresholds will be required to satisfy the Planning Authority of the County Council that there will not be any residual negative noise impacts where practicable. However the complete elimination of all negative noise impacts may be neither practicable nor sustainable. Planning conditions may be imposed to limit noise emissions or to implement noise reduction measures in order to preserve the areas below the protection thresholds.

Noise mitigation measures will either be applied as planning conditions or designed into future proposals of all future developments in accordance with current Irish Legislation to ensure that the relevant noise thresholds and guidelines are not exceeded. Environmental Impact Statements

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including Noise Prediction Modelling to determine mitigation requirements should be prepared for each proposed development, as deemed appropriate by the appropriate planning authorities.

The aims of the present and future noise action plans should be incorporated into the Wicklow County Development Plan, Town Development Plans and into relevant local area plans. Special consideration should be given to zoning objectives, speed limits and established settlements within the area.

Appropriate acoustic engineering of proposed dwellings in close proximity to significant noise sources such as major roads should be requested by the appropriate planning authorities. This should involve incorporating detailed acoustic planning into the development design where developments are planned adjacent to major roads.

7.4 Description of how Areas between the Thresholds will be Managed

The principles outlined in Section 7.3 in relation to the preservation of areas below the threshold will clearly also apply to the management of areas between the threshold levels. This approach is necessary to avoid placing undue focus on areas at the upper and lower extremities of the environmental noise regime and neglecting to consider the median position. The inclusion of the present and future noise action plans into relevant local planning policy and strategies will ensure that future developments will address environmental noise in a sustainable manner.

7.5 Description of how Extent of Noise Impact will be Confirmed

The extent of noise impact will be confirmed by the implementation of the programme of further assessment of the areas above the threshold of assessment subject to available funding as detailed in Section 7.2.

The outcome of the public consultation phase will also identify areas where the public are concerned about the extent of the noise impact. However the perception of noise impact may be quite subjective as what one individual regards as a slight annoyance may be regarded as unbearable noise impact by another.

7.6 Review of Possible Mitigation Measures, where necessary

Existing measures are in place to manage and mitigate noise impacts from a range of sources including road and industrial noise sources in County Wicklow. These include procedures following relevant planning conditions, Environmental Impact Assessment recommendations and designs, Wicklow County Council noise complaint handling protocols, development planning guidelines, road resurfacing and improvements, noise barrier construction as part of road development projects, etc.

There are a number of approaches that can be taken to reduce noise from major roads for existing dwellings. Noise mitigation measures can be divided into physical and non-physical (policy) measures.

7.6.1 Physical Measures

Physical measures include alterations to the topographical layout of the environment and vehicles to reduce noise, which, in the case of the environment means to buffer, block, reduce or filter the noise, and in the case of the vehicle to reduce the level of noise emitted. Some examples of potentially appropriate physical mitigation measures are outlined in Table 7.1.

Table 7.1 – Potential Physical Mitigation Measures

Parameter	Details
Noise Barriers	Installation of noise barriers on major roads away from residential areas. A noise barrier can take many forms, e.g. a cutting, an earth bund, a stone wall or a proprietary noise barrier. The closer the barrier is to the source of noise, i.e. the road, the higher the reduction in traffic noise levels.
Road Surface	A low noise road surfacing is a potential way of controlling road traffic noise at source. The most common variant of low noise road surface is porous asphalt, which is generally considered to offer noise level reductions in the order of 2.5 to 3.5dB (A). However the use of a low noise road surface will have to be compared with other road surfacing materials in relation to the whole life and durability costs of the material.
Traffic calming	These measures can be employed where the major road passes through a built-up area.
Realignment of existing roads	If properly planned and implemented, relocating the road away from high-density settlements along a new alignment can be one of the most effective methods of minimising the numbers of dwellings likely to be affected by the road noise. However, considerable alignment changes are required in order to make a significant difference.

7.6.2 Non - Physical Measures

Non – Physical measures are more commonly referred to as Policy Measures and refer to a variety of options to reduce noise levels through regulatory means. Some examples of potentially appropriate physical mitigation measures are outlined in Table 7.2.

Table 7.2 – Potential Non - Physical Mitigation Measures

Parameter	Details
Environmental Policy	The inclusion of environmental noise assessment, impacts, mitigation etc., in environmental policy could contribute to improvements in noise management.
Planning Policy	Similar to environmental policy the identification and inclusion of noise as a factor in planning policy and decision making has the potential to include mitigation of noise early in the life of a development and as such noise can be sustainably managed.
Wind Energy Policy	Similar to environmental policy the identification and inclusion of noise as a factor in wind energy policy and decision making has the potential to include mitigation of noise early in the life of a development and as such noise can be sustainably managed.
Transportation Policy	A number of areas of Transportation policy can provide mitigation against environmental noise impacts these include
Bans on HGV's	If properly planned and implemented, a ban on Heavy Goods Vehicles in noise sensitive locations could potentially improve the noise environment at the location. However a ban on HGV's may be an unrealistic option due to the importance of the relevant road as a local, regional, national or international transportation corridor.
Reducing Speed Limits	Similar to a ban of HGV's, if properly planned and implemented, reducing speed limits in noise sensitive locations could potentially improve the noise environment at the location. However implementation of this measure would require significant enforcement to ensure compliance with the reduced speed limits especially during night-time hours where the reduction in noise levels is more critical to avoid sleep disturbance.
Public Transportation initiatives	The promotion of public transportation initiatives which reduces the volume of private transportation could potentially reduce associated environmental noise from road corridors.
Construction Standards	The construction and refurbishment of buildings taking cognisance of current and future Building Regulations is a method by which mitigation for environmental noise can be addressed. This could include modern construction materials, moving noise sensitive rooms away from noisy facades etc.
Vehicle Noise Standards	The noise generated by more modern vehicles is generally lower than older vehicles. EU noise limits, scrappage schemes and national vehicle testing have reduced the age of vehicles using the roads and as such a limited reduction in noise emissions has occurred. However modifications to or removal of the vehicle silencer will result in an excessively noisy vehicle. Installation of a sports exhaust on a vehicle is not illegal at present and is a major contributor to nuisance noise from road vehicles.
Tyre Noise	The implementation of the EU Directive (2007/46/EC) in relation to the rolling noise of tyres will in time lead to a reduction of contact noise from road surfaces.

7.7 Assessment of Noise Reduction effects of potential measures

When mitigation measures have been implemented at specific locations, further noise monitoring should be carried out (subject to available funding) after implementation in order to determine the

effectiveness of the mitigation measures and to quantify the improvement achieved. The results of such assessment should be included in subsequent Noise Action Plans to assist in dealing with Environmental Noise in the future

7.8 Budgets & Cost Benefit Analysis

7.8.1 General

As with all works undertaken by any local authority, Wicklow County Council is required to make adequate financial provisions and to account for expenditure of public finances in a transparent manner to carry out its statutory functions.

7.8.2 Budgetary Provisions

The provision of adequate finances to implement the requirements of the Regulations is one which is a challenge to all Local Authorities, not just Wicklow County Council in the current economic climate. A reduction the Regional and Local Road Grant Allocations from the Department of Transport, coupled with reduced income from the Councils own resources (e.g. Development Contribution Schemes etc.) has resulted in a need to prioritize on a much more focused basis the spending of financial resources on road maintenance and repairs.

The financing of works on the National Routes (M1/N11 and N81) is provided by grant allocations from the National Roads Authority. It is expected that the National Roads Authority will be involved with any mitigation measures on the national routes. Financial provisions have not been made available at national level to fund any noise assessment measures, mitigation measures or additional noise mapping requirements resulting from implementation of this action plan.

Staff resources have not been increased to assist in implementation of the plan. Because of the lack of these resources, any mitigation measures must be strictly prioritized. It is hoped that where mitigation measures are identified, their implementation will also be found to be of benefit to other local authority sections e.g. Environment, Planning & Development, Roads & Transportation, and Housing.

7.8.3 Cost Benefit Analysis

Evaluation of the impact of noise nuisance is complicated because noise nuisance is subjective; it is largely related to the type of noise, the source of the noise and whether it is welcome or unwelcome, and background noise levels in the environment. Responses to noise from the different transport sources can vary considerably (ref HEATCO).

The impact of mitigating measures to address noise nuisance is further complicated because noise is measured on a logarithmic scale and human perception of loudness does not directly coincide with increased sound pressure levels (e.g. a 3dB increase in noise, which represents a doubling in sound pressure level, is the smallest statistically significant increase in loudness detectable by the human ear).

To reduce the subjective “loudness” of a noise source by 50% would require a 10dB drop in noise level and may be very difficult to achieve without major investment in noise mitigation. Assigning a monetary cost to the noise nuisance can enable cost benefit analysis to be used as a decision support tool in determining what (if any) noise mitigation measure is to be implemented. The position of the EC working group on health and socio-economic valuation of noise (ref paper + DCC action plan) recommends the following in relation to road noise:

- *For road transport, the (interim) use of the median value change in noise perceived by households of €25 per dB (Lden), per household per year. The validity range of this interim value is between 50/55 Lden and 70/75 Lden and it should be adjusted as new research on the value of noise becomes available.*
- *The estimate of the change should apply at all initial noise levels, and regardless of the size of any change brought about;*

As a preliminary step in carrying out cost benefit analysis on possible noise mitigation measures, Wicklow County Council propose to assign the monetary benefit to noise mitigation measures as recommended above (i.e. €25 per dB (Lden) per household per year).

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The number of households in the immediate area that would potentially benefit from a particular mitigation measure will also be factored into the analysis.

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8 IMPLEMENTATION OF FIRST NOISE ACTION PLAN

8.1 General

Wicklow County Council as an Action Planning Authority was required to prepare a Noise Action Plan in accordance with the Regulations for the First Round of Noise Action Planning by the 18th July 2008. Due to technical difficulties (including a lack of expertise in the area) this deadline was not reached and the Draft First Round Action Plan was sent to the EPA on the 14th December 2010.

A proposed programme of works was included in the Draft First Round Noise Action Plan for the duration of the Plan. The outcome of this programme of works is detailed in Section 8.2

8.2 Report on Outcome of Actions Proposed

Table 8.1 details the actions proposed and the resultant outcome as a result of the First Noise action Plan

Table 8.1 - Outcome of proposed First Round Actions

Description	Outcome
<u>Year 2011/2012</u>	
Commence identification of Quiet Areas in Open Country for approval by the EPA and the Minister, taking into account County Wicklow's Landscape Character Assessment Study and objectives of the Development Plans.	Not Completed. Objective to be included in 2 nd Round Action Plan 2013
Carry out a local review of the environmental noise situation accounting for new developments and changes in major infrastructure.	
Review the status of the N11, and the criteria that warrants its inclusion on the strategic maps under current legislative requirements.	Completed as part of 2011 Noise Mapping exercise
Evaluate the environmental noise impact at sensitive locations on a priority basis.	Not Completed due to lack of funding and

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Description	Outcome
	technical expertise
Noise monitoring will be carried on at selected residential clusters and sensitive receptors (schools, churches etc. identified in the decision support matrix) and noise mitigation provided on a priority basis, depending on funding.	Not Completed due to lack of funding and technical expertise
<u>Year 2012/2013</u>	
Commence implementation of any noise mitigation actions, where necessary, on a priority basis, dependent on funding.	Not Completed due to lack of funding and technical expertise
<u>Year 2013/2014</u>	
Continue with implementation of appropriate noise management actions and evaluate effectiveness of any environmental noise reduction measures, dependent on funding.	Not Completed due to lack of funding and technical expertise
By 2014, Wicklow County Council will carry out a review of the program of works implemented under this action plan. Progress and results will be evaluated using information gathered through local assessment of environmental noise exposure. This will include evaluations of any noise mitigation measures. A review of new noise maps will also be carried out, giving an indication of the change in environmental noise levels and the numbers of people exposed.	Not Completed due to lack of funding and technical expertise
The second round of the regulations provides for noise mapping bodies to make strategic noise maps before the 30th June 2012 for the following: Major roads (defined in the regulations as roads with > 3 million vehicles per annum). Major railways (defined as > 30,000 trains per annum). Agglomerations with > 100,000 inhabitants. Major airports with >50,000 movements per annum. (Although this is omitted from the Regulations, the END requires action plans for these airports in 2013 thus requiring noise mapping in 2012).	Completed as part of 2011 Noise Mapping exercise
Revised/amended action plans must be prepared on foot of the extended strategic noise maps, by 18th July 2013.	Ongoing

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While a number of proposed actions were identified for implementation in the First Round noise Action Plan, subject to funding, the reality of the completion and preparation of the Second Round Noise Mapping and Noise Action Plan has essentially superseded these proposed actions. It is envisaged that proposed actions identified in the First Round Action Plan will be included where deemed necessary in the Second Round Action Plan for implementation over the life of the Second Round Action Plan 2013. These proposed actions are identified and detailed in Section 10.

8.3 Report on Reduction of (1st Round) Population affected by Environmental Noise

Wicklow County Council estimates that there has been a negligible if any reduction in the population affected by environmental noise in the Action Planning Area over the life of the First Round Noise Action Plan. Factors which have could have altered the environmental noise patterns in the Action Plan are over the period include the following.

Potential increased subscription to modes of public transportation due to the reduction in disposable income to operate private transportation due to the economic recession.

Reduction in road traffic levels due to the economic recession and reduction in economic activity. With the exception of the Wicklow Port Access and Town Relief Road and the N11 Kilpedder Interchange no major road improvement schemes have been completed in the Action Plan period which included noise mitigation measures as part of the schemes.

Changes to the process of the assessment of damage National Road surfacing courses has resulted in no significant pavement replacement works on the N11 over the Action Plan period.

Repairs to pavement surfacing materials on National Roads have been limited to planing out and replacing defective areas (including potholes) only on the N11 due to funding limitations.

The reclassification (to motorway status) of a portion of the First Round Major Road network (N11 from Junction 15 to Junction 14) including raising the speed limit from 100kph to 120kph.

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Minor modifications to the posted speed limits on the First Round Major Road network.

A reduction in economic activity has resulted in a decline in revenues from Development Contribution Schemes which in the pasts would have funded upgrades to roads and other infrastructure projects.

Reduced budget allocations may have resulted in longer lead in times to implement essential pavement repairs.

9 CONSULTATION & PUBLIC PARTICIPATION

9.1 Requirement for Public Participation and Consultation with Statutory Bodies

Wicklow County Council as an Action Planning Authority is required by The Regulations to consult the public when drawing up and revising Action Plans. The public must be consulted about the proposals in the Draft Action Plan and given early and effective opportunities to participate in the preparation and review of the Plan. The public must be informed of decisions taken and reasonable time must be provided for each stage of public participation. Furthermore the Draft Noise Action Plan was forwarded for review and comment to relevant stakeholders i.e. The National Roads Authority, Local Councils and Action Planning Authorities for neighbouring counties and other relevant Statutory Bodies to encourage wide participation in the consultation process.

Wicklow County Council is subject to the provisions of the Freedom of Information (FOI) Act 1997 and the Freedom of Information (Amendment) Act 2003. Wicklow County Council is subject to a Freedom of Information request under these Acts may have no option but to release the information in accordance with the requirements of the relevant legislation. Members of the General Public, Statutory Bodies and other Groups and Organisations should be aware of this fact in relation to any submissions or observations made in relation to participation in the consultation phase of the Draft Noise Action Plan.

9.2 Public Participation and Consultation

The Draft Noise Action Plan was put on public display at Wicklow County Council offices and made available in electronic format on the Wicklow County Council website. Submissions from the public were reviewed and considered and the Action Plan was amended as necessary, taking account of the submissions and the suggestions contained therein, wherever appropriate.

The Draft Noise Action Plan was available for inspection on the web site www.wicklow.ie.

The Draft Noise Action Plan was available to be inspected at the following locations during normal

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opening hours i.e. 9.00am to 5.00pm, Monday to Friday (excluding public holidays) from the 26th June 2013 to 12th July 2013.

Wicklow County Council	Bray Town Council	Arklow Town Council	Wicklow Town Council
County Buildings,	Civic Offices,	Avoca River House,	Town Hall,
Whitegates,	Main Street,	Bridgewater Centre,	Market Square,
Wicklow,	Bray,	Arklow,	Wicklow,
Co. Wicklow	Co. Wicklow	Co. Wicklow	Co. Wicklow

Any submissions or observations in relation to the Draft Noise Action Plan could have been made in writing to,

The Senior Executive Officer,
Roads and Transportation,
Wicklow County Council,
Whitegates, Cill Mhantáin,
Co. Wicklow

or may be made by email to noiseplan@wicklowcoco.ie within the period from 26th June 2013 to 12th July 2013.

Submissions were to be clearly marked “**Draft Noise Action Plan 2013**”. A notice was placed in local newspapers inviting the public to submit their views on the Draft Noise Action Plan.

To summarise, Wicklow County Council’s requirements when preparing and revising Noise Action Plans include the following:

- the public is consulted about proposals for Action Plans;
- the public is given early and effective opportunities to participate in the preparation and review of the Action Plans;
- the results of the public participation are taken into account;

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- the public is informed of the decisions taken; and
- reasonable time frames are provided allowing sufficient time for each stage of public participation.

9.3 Consultation and Outcome of Consultation with Statutory and Other Bodies

Wicklow County Council will proactively seek consultation from relevant groups such as:

- Department of the Environment;
- Environmental Protection Agency;
- National Roads Authority
- Iarnród Éireann
- Responsible Authorities for adjacent areas including local and regional authorities;
- Local and national pressure groups
- Non Government Organisations and professional bodies; and
- Local citizen groups.

The outcome of the consultation process with Statutory and Other relevant Bodies will be summarised in tabular form in Appendix G.1 once the consultation phase is concluded.

9.4 Outcome of Public Participation and Consultation

The outcome of the public participation and consultation phase will be completed after the conclusion of the consultation period on the 12th July 2013. The responses will be collated and summarised in tabular form in Appendix G.2.

The Final Wicklow County Council Noise Action Plan 2013 will then be published at this time.

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10 IMPLEMENTATION OF NOISE ACTION PLAN

10.1 Roles & Responsibilities for Implementation of Noise Action Plan

The Regulations (SI 140 of 2006) designate on certain state Agencies and Authorities roles and responsibilities in relation to implementing the Regulations.

10.1.1 Wicklow County Council

Wicklow County Council is the designated Action Planning Authority as defined in the Regulations for the preparation of Noise Action Plans for County Wicklow. Wicklow County Council is also the designated noise mapping body for non-national roads within County Wicklow which have a traffic flow above the major roads flow threshold.

10.1.2 National Roads Authority (NRA)

The National Roads Authority as the state agency with ultimate responsibility for the funding, management and upgrading of the national road network have a function in relation to the implementation of the Noise Action Plan. The NRA are also the noise mapping body for the major national road in County Wicklow which accounts for 63% (or 65kms) of the total major road network of 103 kilometres.

The main measure the NRA will implement over the lifespan of the current Noise Action Plan will be the construction of the Rathnew to Arklow Road Improvement Scheme which is being managed directly by the NRA using a Public Private Partnership (PPP) model.

10.1.3 Environmental Protection Agency (EPA)

The EPA as the regulatory body as defined by the Regulations will provide continued guidance and advice on the implementation of the Regulations including the implementation of the Noise Action Plan.

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10.1.4 Iarnród Éireann

Iarnród Éireann (Irish Rail) as the relevant designated noise mapping body for major railways will have a limited involvement in the implementation of the Noise Action Plan due to the limited extent of major railway lines in County Wicklow.

10.1.5 Neighbouring Noise Action Planning Authorities

Wicklow County Council will during the Implementation of the Noise Action Plan seek to liaise closer with adjoining Action Planning Authorities with regard to the implementation of the Noise Action Plan as it affects areas of County Wicklow which border other counties.

10.2 Targets and Objectives for Implementation of Noise Action Plan

It is a target for Wicklow County Council during the implementation of the Noise Action Plan to undertake the Programme of Works detailed in Section 10.3 subject to the availability of sufficient technical staff, expertise and financial resources.

Wicklow County Council includes as a core objective compliance with the requirements of the Environmental Noise Regulations 2006, SI No. 140 of 2006 and any other relevant environmental noise legislative requirements to the satisfaction of the Environmental Protection Agency.

Furthermore Wicklow County Council wishes to promote through sustainable development policies preservation in environmental noise levels within the county. Wicklow County Council also includes noise reduction as a significant part of its long term strategic policy objective for the management of environmental noise.

10.3 Programme of Works

Wicklow County Council has developed the following planned programme of works which it proposes to implement over the duration of the Noise Action Plan on a phased basis, subject to the availability of sufficient technical staff, expertise and financial resources. The programme of

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work will be subject to an End of Programme Review in 2018 and the results of this review will be included in the 2018 (Round 3) Noise Action Plan.

10.3.1 Current Year / Year One (2013 / 2014)

The Proposed Programme of Works for the Current Year / Year One is contained in Table 10.1.

Table 10.1 – Current Year / Year One (2013 / 2014) Proposed Programme of Works

Item	Details	Outcome
	<u>Current Year (2013)</u>	
10.3.1.1	Submit the Draft Noise Action Plan 2013 to EPA for comments.	
10.3.1.2	Review comments received from the EPA, revise Draft Noise Action Plan 2013 as necessary.	
10.3.1.3	Advertise the Revised Draft Noise Action Plan 2013 in the local press and on the Wicklow County Council Website inviting emailed / written submissions or observations from the public.	
10.3.1.4	Put the Revised Draft Noise Action Plan 2013 on public display.	
10.3.1.5	Issue the Revised Draft Noise Action Plan 2013 to relevant Statutory Bodies for submissions or observations.	
10.3.1.6	Review submissions or observations received through the consultation process and amend Revised Draft noise Action Plan 2013 as necessary to produce Final Noise Action Plan 2013.	
10.3.1.7	Submit Final Noise Action Plan 2013 to the EPA by 18th. July 2013 to allow the EPA to report on the Action Plan to the EC in January 2014.	
10.3.1.8	Upload Final Noise Action Plan 2013 onto the Wicklow County Council Website for public information.	
10.3.1.9	Progress the construction and delivery of the Rathnew to Arklow Road Improvement Scheme during 2013.	
10.3.1.10	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2013.	
	<u>Year One (2014)</u>	
10.3.1.11	Superimposing the relevant Strategic Noise Maps (L_{den} and L_{night}) over detailed OSI background mapping and the Geodirectory to identify particular “hot spot” locations.	
10.3.1.12	Use the Decision Support Matrix to identify and prioritise areas requiring further assessment and / or potential mitigation measures on a phased basis subject to funding availability.	

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10.3.1.13	Collate location and sources of areas for further assessment and /or possible mitigation measures.	
10.3.1.14	Liaise with relevant stakeholder regarding sourcing finance to carry out further assessment and implementation of potential mitigation measures.	
10.3.1.15	Progress the construction and delivery of the Rathnew to Arklow Road Improvement Scheme during 2014.	
10.3.1.16	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2014.	

10.3.2 Year Two (2015)

The Proposed Programme of Works for Year Two is contained in Table 10.2.

Table 10.2 – Year Two (2015) Proposed Programme of Works

Item	Details	Outcome
	<u>Year Two (2015)</u>	
10.3.2.1	Liaise with Wicklow County Council Planning Department as part of Preparation Process for next County Development Plan 2017- 2023 regarding strengthening the policy in relation to protecting against Environmental Noise Impacts.	
10.3.2.2	Subject to funding commence on a prioritised basis the assessment of areas identified as requiring further assessment for mitigation measures.	
10.3.2.3	Continue liaising with relevant stakeholders regarding sourcing finance to carry out further assessment and implementation of potential mitigation measures.	
10.3.2.4	Identify prioritised potential mitigation measures post additional assessment and carry out a Cost Benefit Analysis to assess relative benefit from mitigation measures subject to funding.	
10.3.2.5	Review the effectiveness of the Decision Support Matrix in identifying and prioritising areas requiring further assessment and / or potential mitigation measures.	
10.3.2.6	Progress the construction and delivery of the Rathnew to Arklow Road Improvement Scheme towards completion in Q4 of 2015.	
10.3.2.7	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2015.	

10.3.3 Year Three (2016)

The Proposed Programme of Works for Year Three is contained in Table 10.3.

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Table 10.3 –Year Three (2016) Proposed Programme of Works

Item	Details	Outcome
	<u>Year Three (2016)</u>	
10.3.3.1	Continue liaising with Wicklow County Council Planning Department as part of Preparation Process for next County Development Plan 2017-2023 regarding strengthening the policy in relation to protecting against Environmental Noise Impacts.	
10.3.3.2	Subject to funding continue on a prioritised basis the assessment of areas identified as requiring further assessment for mitigation measures.	
10.3.3.3	Continue liaising with relevant stakeholders regarding sourcing finance to carry out further assessment and implementation of potential mitigation measures.	
10.3.3.4	Continue to identify prioritised potential mitigation measures post additional assessment and carry out a Cost Benefit Analysis to assess relative benefit from mitigation measures subject to funding.	
10.3.3.5	Implement on a phased based over the balance of the plan period the implementation of required mitigation measures subject to available funding	
10.3.3.6	Carry out a mid plan review to assess progress in implementation of Action Plan in Q3 of 2016. Report Findings to SPC and publish on Website.	
10.3.3.7	Ensure financial provisions are in place to carry out relevant assessments in 2016 in order to produce new strategic noise maps in 2017 for assessment year 2016.	
10.3.3.8	Assess the extent (in Q2 to Q4 of 2016) of the non national road network in County Wicklow which will be required to be strategically noise mapped in 2017 for assessment year 2016.	
10.3.3.9	Carry out traffic counts at the locations assessed in 2011 (in Q2 to Q4 of 2016) to identify changes in traffic volumes.	
10.3.3.10	Carry out additional traffic counts as necessary (in Q2 to Q4 of 2016) on roads considered for inclusion in 2017 noise mapping exercise.	
10.3.3.11	Collate and quality check source data in Q4 of 2016 for inclusion in 2017 noise mapping exercise.	
10.3.3.12	Conclude the construction and delivery of the Rathnew to Arklow Road Improvement Scheme in 2016 if not completed in 2015.	
10.3.3.13	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2016.	

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10.3.4 Year Four (2017)

The Proposed Programme of Works for Year Four is contained in Table 10.4.

Table 10.4 –Year Four (2017) Proposed Programme of Works

Item	Details	Outcome
	<u>Year Four (2016)</u>	
10.3.4.1	Ensure financial provisions are in place to produce new strategic noise maps in 2017 for assessment year 2016.	
10.3.4.2	Subject to funding continue on a prioritised basis the assessment of areas identified as requiring further assessment for mitigation measures.	
10.3.4.3	Continue liaising with relevant stakeholders regarding sourcing finance to carry out further assessment and implementation of potential mitigation measures.	
10.3.4.4	Continue to identify prioritised potential mitigation measures post additional assessment and carry out a Cost Benefit Analysis to assess relative benefit from mitigation measures subject to funding.	
10.3.4.5	Implement on a phased based over the balance of the plan period the implementation of required mitigation measures subject to available funding	
10.3.4.6	Cooperate with relevant stakeholder agencies to produce new strategic noise maps in 2017 for 2016 assessment year	
10.3.4.7	Publish New Strategic Noise Maps in 2017 for assessment year 2016 in Q4 of 2017 on Wicklow County Council website.	
10.3.4.8	Commence collating and quality checking source data in Q4 of 2016 for inclusion in 2018 Noise Action Plan.	
10.3.4.9	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2017.	

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10.3.5 Year Five (2018)

The Proposed Programme of Works for Year Five is contained in Table 10.5.

Table 10.5 – Year Five (2018) Proposed Programme of Works

Item	Details	Outcome
	<u>Year Five (2018)</u>	
10.3.5.1	Carry out End of Plan Review to assess progress in implementation of Action Plan in Q1 of 2018. Include findings in Draft Noise Action Plan 2018.	
10.3.5.2	Ensure financial provisions are in place to produce new Noise Action Plan 2018.	
10.3.5.3	Prepare Draft Noise Action Plan 2018 (Round 3) in Q1.	
10.3.5.4	Submit the Draft Noise Action Plan 2018 to EPA for comments.	
10.3.5.5	Review comments received from the EPA, revise Draft Noise Action Plan 2018 as necessary.	
10.3.5.6	Advertise the Revised Draft Noise Action Plan 2018 in the local press and on the Wicklow County Council Website inviting emailed / written submissions or observations from the public.	
10.3.5.7	Put the Revised Draft Noise Action Plan 2018 on public display.	
10.3.5.8	Issue the Revised Draft Noise Action Plan 2018 to relevant Statutory Bodies for submissions or observations.	
10.3.5.9	Review submissions or observations received through the consultation process and amend Revised Draft noise Action Plan 2018 as necessary to produce Final Noise Action Plan 2018.	
10.3.5.10	Submit Final Noise Action Plan 2018 to the EPA by 18th. July 2018 to allow the EPA to report on the Action Plan to the EC in January 2019.	
10.3.5.11	Upload Final Noise Action Plan 2018 onto the Wicklow County Council Website for public information.	
10.3.5.12	Progress the construction and delivery of the Rathnew to Arklow Road Improvement Scheme during 2013.	
10.3.5.13	Annual Briefing on Noise Action Plan to Transportation and Road Infrastructure Strategic Policy Committee in December 2018.	

10.4 Evaluation, Review and Corrective Action Programmes

The Programme of Works detailed in Section 10.3 is the current best assessment of the works required to preserve and mitigate where necessary the environmental noise in County Wicklow. As detailed the Implementation of the Programme of Works is dependant on the availability of sufficient technical staff, expertise and financial resources in order to progress the programme.

In line with current practice within Wicklow County Council the Transportation and Roads Strategic Policy Committee (SPC) will continue to be briefed on an annual basis in relation to the Noise Action Plan at the December meeting over the duration of the Noise Action Plan. Briefings or Information Mornings may over the course of the Action Plan be held to inform other SPC groups and technical staff in other departments in relation to the requirements, actions and plans in relation to the Noise Action Plan.

10.5 End of Programme Review

A complete review of the Programme detailed in Section 10.3 will be undertaken in 2018 during the preparation of the 2018 Noise Action Plan (Round 3). This end of programme review will disregard any interim reviews and focus on the original programme of Works and the implementation of same. The details of the review will be included in the 2018 Noise Action Plan.

11 SUMMARY & CONCLUSIONS

The Environmental Noise Regulations 2006 (S.I. 140 of 2006), which gives effect to the EU Environmental Noise Directive, requires that Local Authorities prepare Noise Action Plans for their functional areas in respect of specified environmental noise sources. Noise Action Plans are based upon the results of strategic noise mapping carried out by the relevant Noise Mapping Bodies identified in the Regulations.

This Noise Action Plan describes the action planning area, existing noise management legislation and guidance and the responsible authorities. Mitigation and protection measures are set out for these areas and a provisional implementation plan has been drawn up. This Noise Action Plan covers a five year period beginning in 2013 and must be reviewed and revised if necessary in 2018.

Strategic Noise Mapping in respect of major roads with traffic in excess of 3 million movements per year (8,250 AADT) was carried out by the National Roads Authority in respect to national roads and by the National Roads Authority on behalf of Wicklow County Council in respect to major non national roads. A total of 103 kilometres of major roads (equating to under 5% of the total length of roads in County Wicklow) were identified and mapped. This Noise Action Plan is based on the results of these strategic noise maps and the first round Noise Action Plan prepared in 2010 by White Young Green on behalf of Wicklow County Council.

The strategic noise mapping has been assessed and areas that are to be subject to further assessment and potential noise management activities subject to funding have been identified.

The public has been given an opportunity to participate in the preparation of the Wicklow County Council Noise Action Plan 2013, by conducting a public consultation process on the Draft Noise Action Plan 2013. The results of the public participation were taken into account when preparing the final document and the public will be informed of the decisions taken. Other bodies including the National Roads Authority, adjacent Local Authorities and other relevant organisations were consulted on the draft document.

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The Noise Action Plan has been drawn up with the twin aims of:

- 1) Protecting the future noise climate,
- 2) Improving the existing noise climate where necessary.

The effective management of *future* environmental noise arising from new developments or developments adjacent to existing sources of environmental noise can be addressed to some extent through the planning consent process.

The current Wicklow County Council Development Plan 2010-2016, covers the issue of environmental noise under a number of interlinked headings including, Waste & Environmental Emissions, Roads & Transportation and Energy & Communications.

12 REFERENCES

Directive 2002/49/EC relating to the assessment and management of environmental noise.

Environmental Noise Regulations 2006, (S.I. No. 140 of 2006)

Environmental Protection Agency, Guidance Note on Action Planning, July 2009.

Environmental Protection Agency, Guidance Note for Strategic Noise Mapping (Version 2) August 2011.

Environmental Protection Agency, Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), April 2012

Environmental Protection Agency, Frequently Asked Questions on NG4, 2012

Environmental Protection Agency Act 1992, (S.I. No. 7 of 1992)

Roads Act 1993, (S.I. No. 14 of 1993)

NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1, 25th October 2004.

Wicklow County Council Development Plan 2010-2016.

Wicklow County Council Wind Strategy

Quarries and Ancillary Activities: Guidelines for Planning Authorities, DOEHLG April 2004.

Wind Energy Development Guidelines, DOEHLG

HEATCO, Developing Harmonised European Approaches for Transport Costing and

Valuation of Noise: Position Paper of the Working Group on Health and Socio Economic Aspects.

FEHRL Study S12.408210 Tyre Road Noise.

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ISO 1996-1:2003 – Acoustics - Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures
http://www.iso.org/iso/catalogue_detail?csnumber=28633

Central Statistics Office Census Data www.cso.ie.

Noise Action Plan for Dublin Agglomeration.

UK Department of Communities and Local Government, National Planning Policy Framework
March 2012.

Appendix A

Glossary of Acoustic and Technical Terms

Wicklow County Council Noise Action Plan 2013

Term	Definition
AADT	Average Annual Daily Traffic
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
BAT	Best Available Technique" is defined as the most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for measures designed to prevent or eliminate or, where that is not practicable, generally to reduce an impact on the environment as a whole.
CCC	Carlow County Council
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
DCC	Dublin City Council
DEM	Digital Elevation Model
DLRCC	Dun Laoghaire Rathdown County Council
DSM	Digital Surface Model
DTM	Digital Terrain Model
EC	European Commission
Environmental Noise	Environmental noise means 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
END	Environmental Noise Directive (2002/49/EC)
EPA	Environmental Protection Agency
ESRI	Environmental Systems Research Institute
EU	European Union
GIS	Geographic Information System
IE	Iarnród Éireann or Irish Rail

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Term	Definition
INM	Integrated Noise Model
Irish National Grid (ING)	The official spatial referencing system of Ireland
ISO	International Standards Organisation
KCC	Kildare County Council
Major Airport	A Major airport means a civil airport which has more than 50,000 movements per year, excluding those movements purely for training purposes on light aircraft; in this context, "a movement" means a single take-off or landing of an aircraft
Major Railway	A Major railway means a railway line which has more than 30,000 train passages per year
Major Road	A Major road means a national, regional or international road which has more than three million vehicle passages per year
Metadata	Descriptive information summarising data
MMaRC	Motorway Maintenance and Renewals Contract
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)
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: $L_{den} = 10 * \log \frac{1}{24} \{ 12 * 10^{((L_{day})/10)} + 4 * 10^{((L_{evening}+5)/10)} + 8 * 10^{((L_{night}+10)/10)} \}$
Noise Level – $L_{A10,18h}$	$L_{A10,18h} = L_{A10,18h}$ (06:00 to 24:00)
Noise Mapping (General)	Noise-mapping means the presentation of data on an existing or predicted noise situation in terms of a noise indicator, indicating breaches of any relevant limit value in force, the number of people affected in a certain area, or the number of dwellings exposed to certain values of a noise indicator in a certain area.
Noise Mapping (Input) Data	Two broad categories: (1) Spatial (e.g. road centre lines, building outlines).

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Term	Definition
	(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
NRA	National Roads Authority
Output Data	The noise outputs generated by the noise model
OSI	Ordnance Survey for Ireland
PPP	Public Private Partnership
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
The Regs	The Regulations – Statutory Instrument 140 of 2006
RMR	The railway noise calculation method published in the Netherlands in 'Reken- en Meetvoorschrift Railverkeerslawaaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996'.
SDCC	South Dublin County Council
Spatial (Input) Data	Information about the location, shape, and relationships among geographic features, for example road centre lines and buildings.
Stakeholders	Any individual, group of individuals, organisation, government agency (e.g. EPA, NRA) who has any relevant input in relation to the implementation of Noise Action Planning.
WG - AEN	Working Group – Assessment of Exposure to Noise
WXCC	Wexford County Council
XPS	The French road traffic noise calculation method published in 'NMPB-Routes-96 (SETRA-CERTULCPC-CSTB)', referred to in 'Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6' and in the French standard 'XPS 31-133'.

Appendix B

Action Planning Area Map

Figure B.1 Action Planning Area - County Wicklow



Appendix C

Strategic Noise Maps – Major Roads

Figure C.3 Strategic Noise Mapping for Major Roads L_{den}

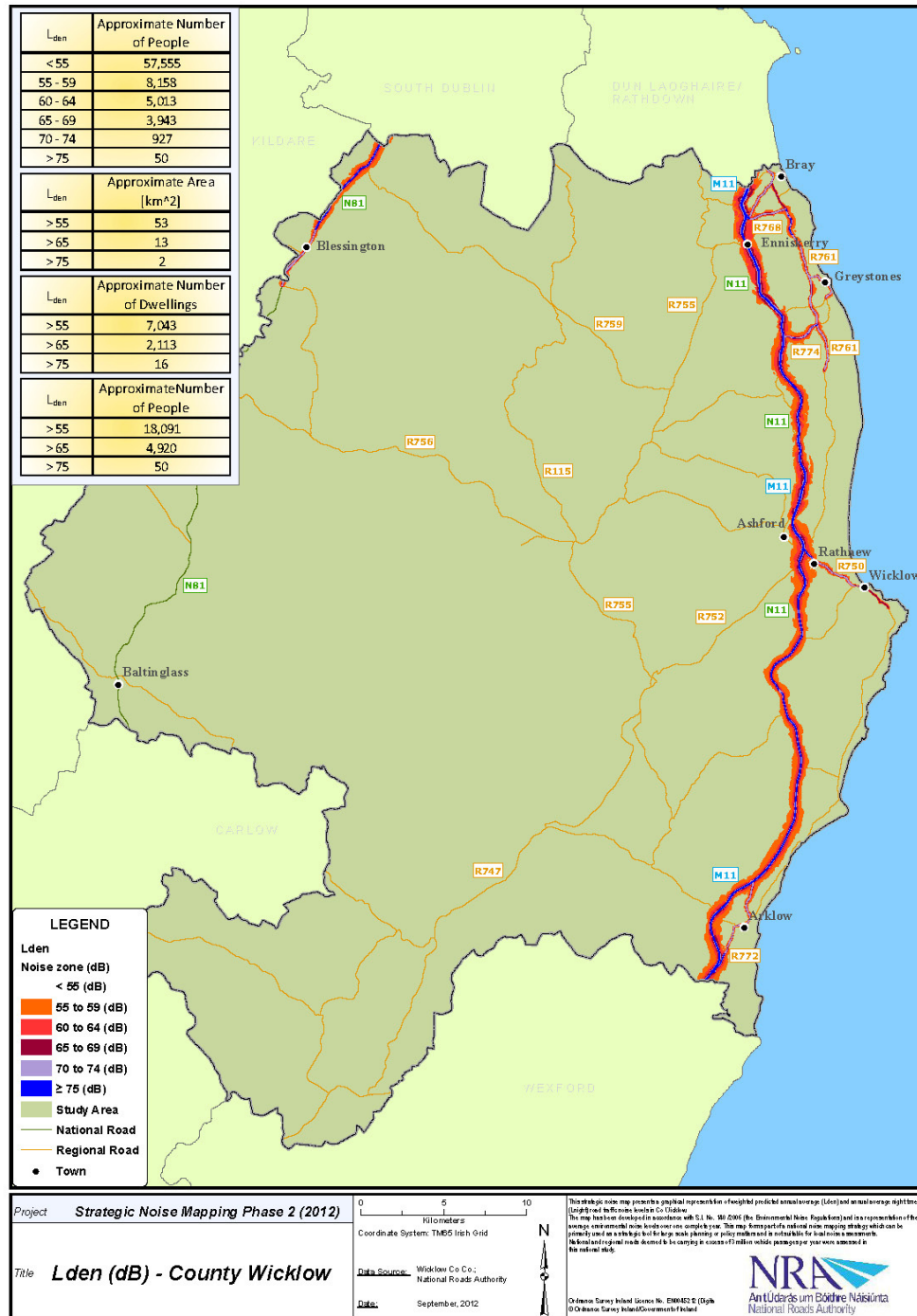
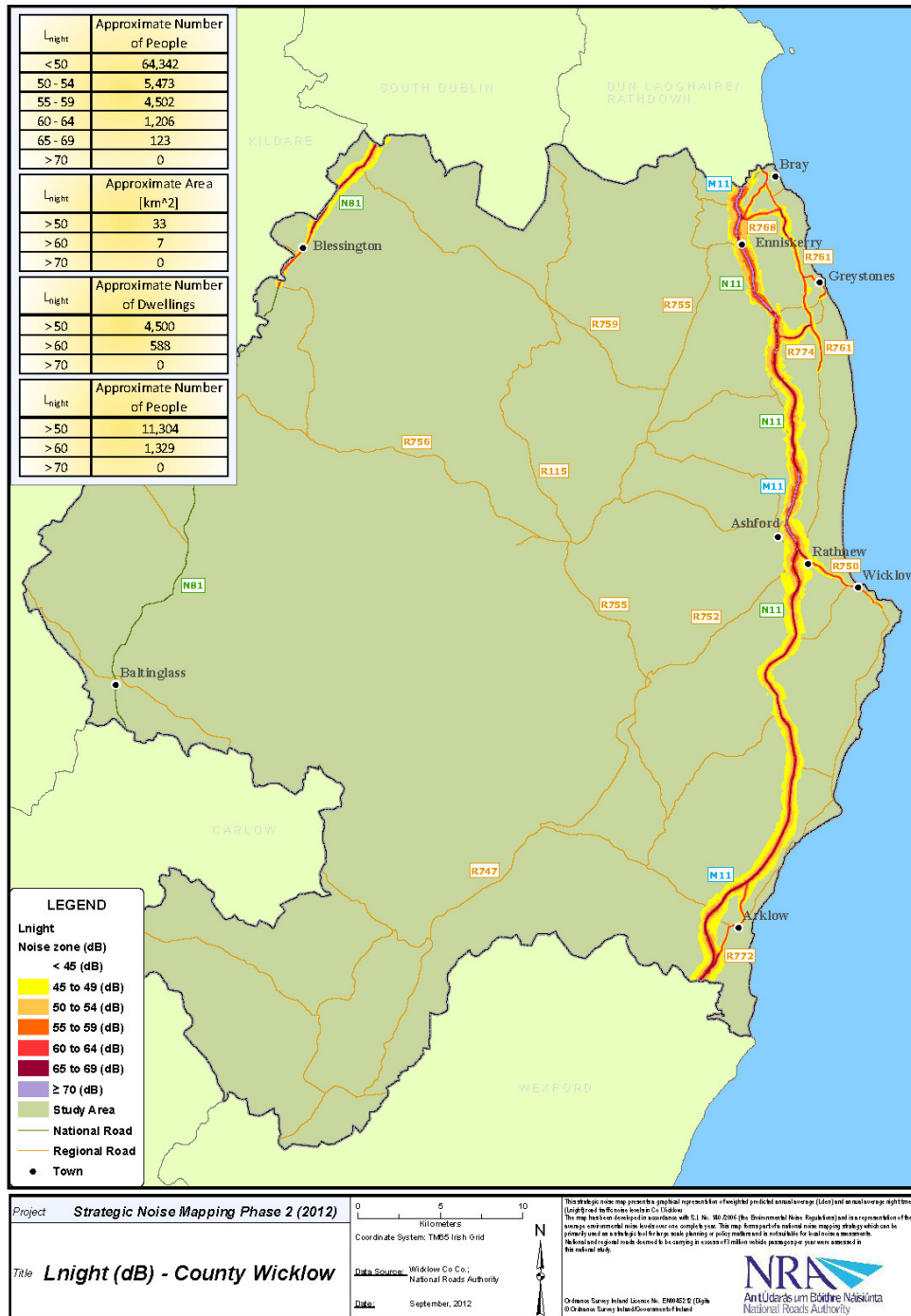


Figure C.4 Strategic Noise Mapping for Major Roads L_{NIGHT}



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Appendix D

Strategic Noise Maps – Major Railways

Figure D.1 Rail Network in County Wicklow

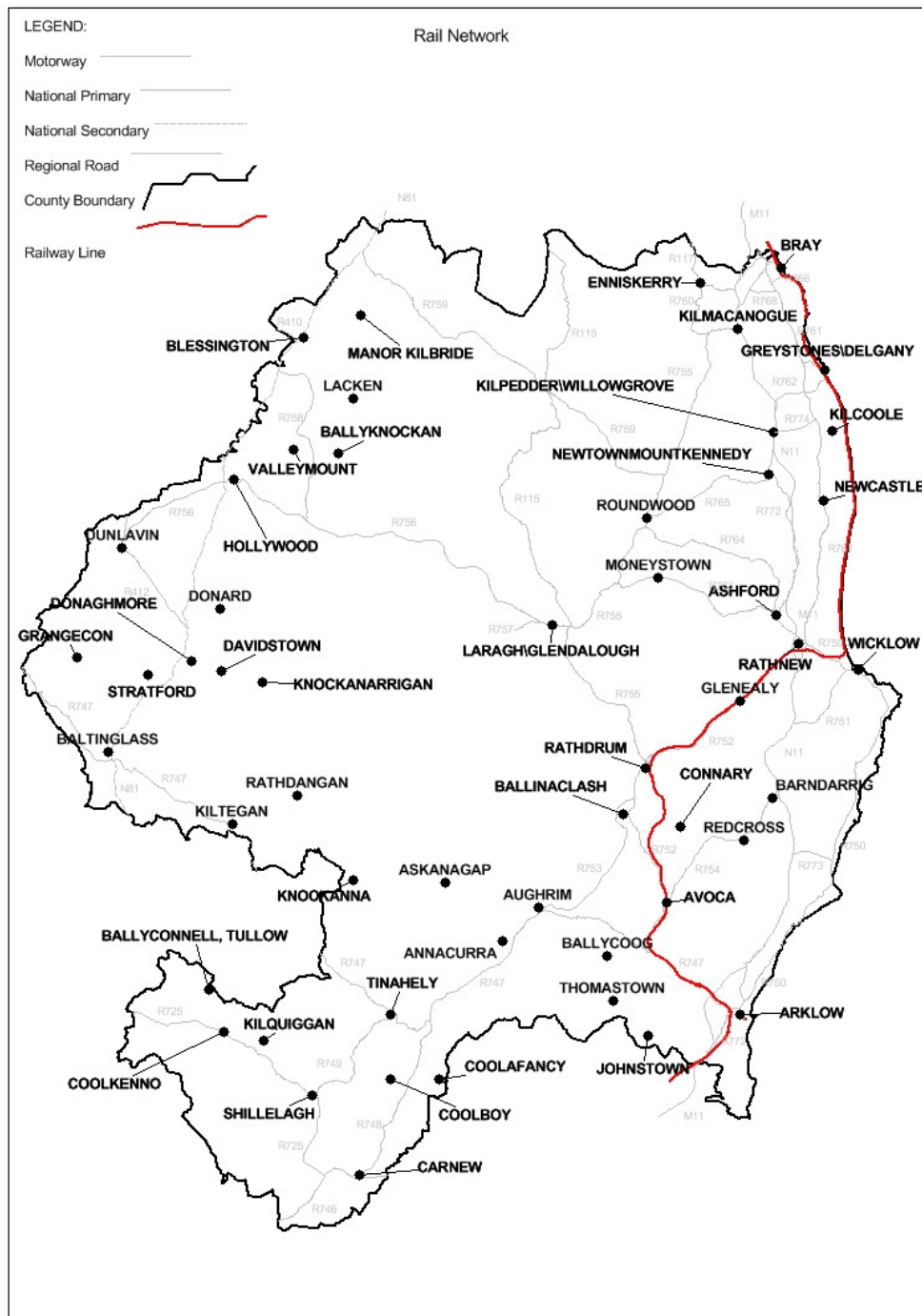
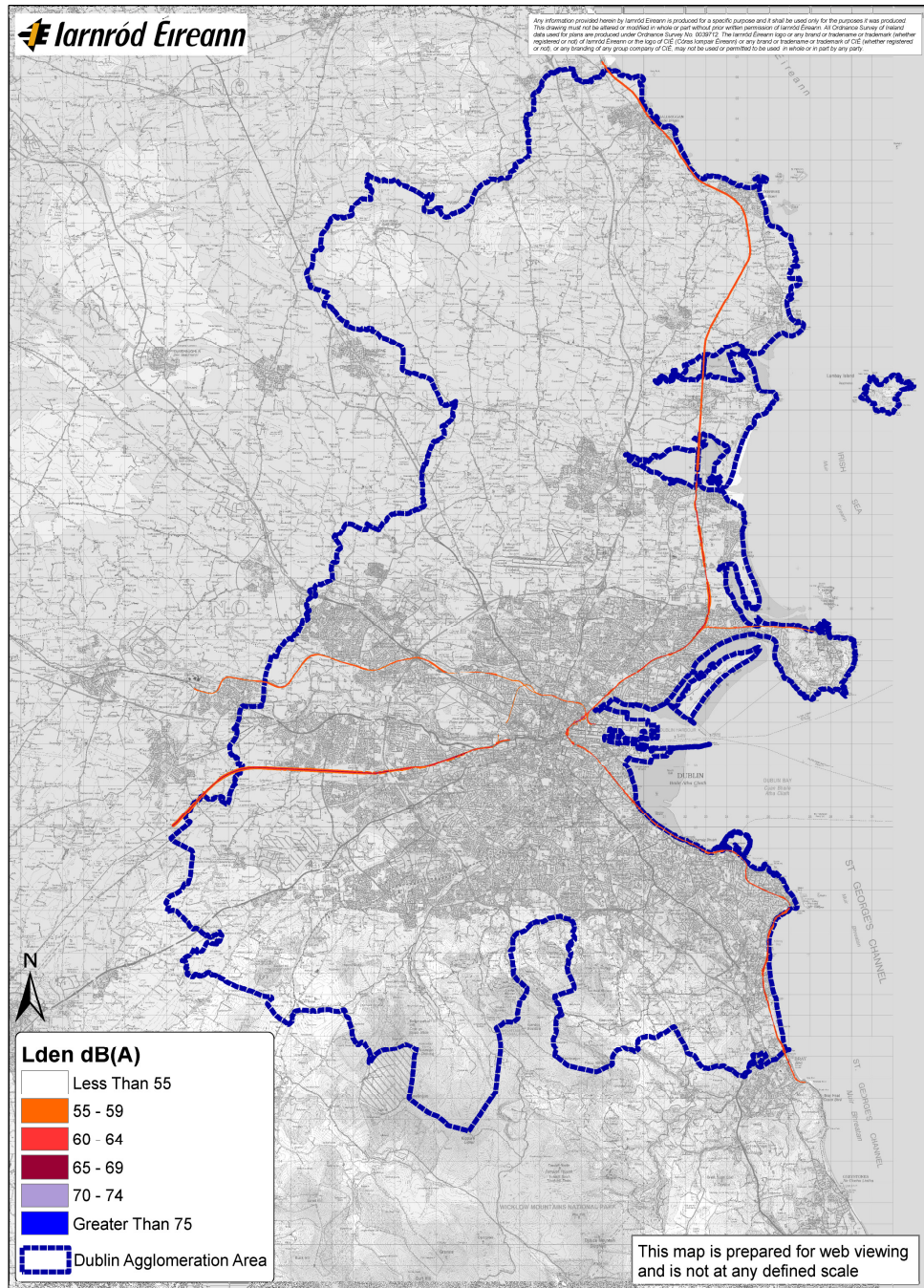
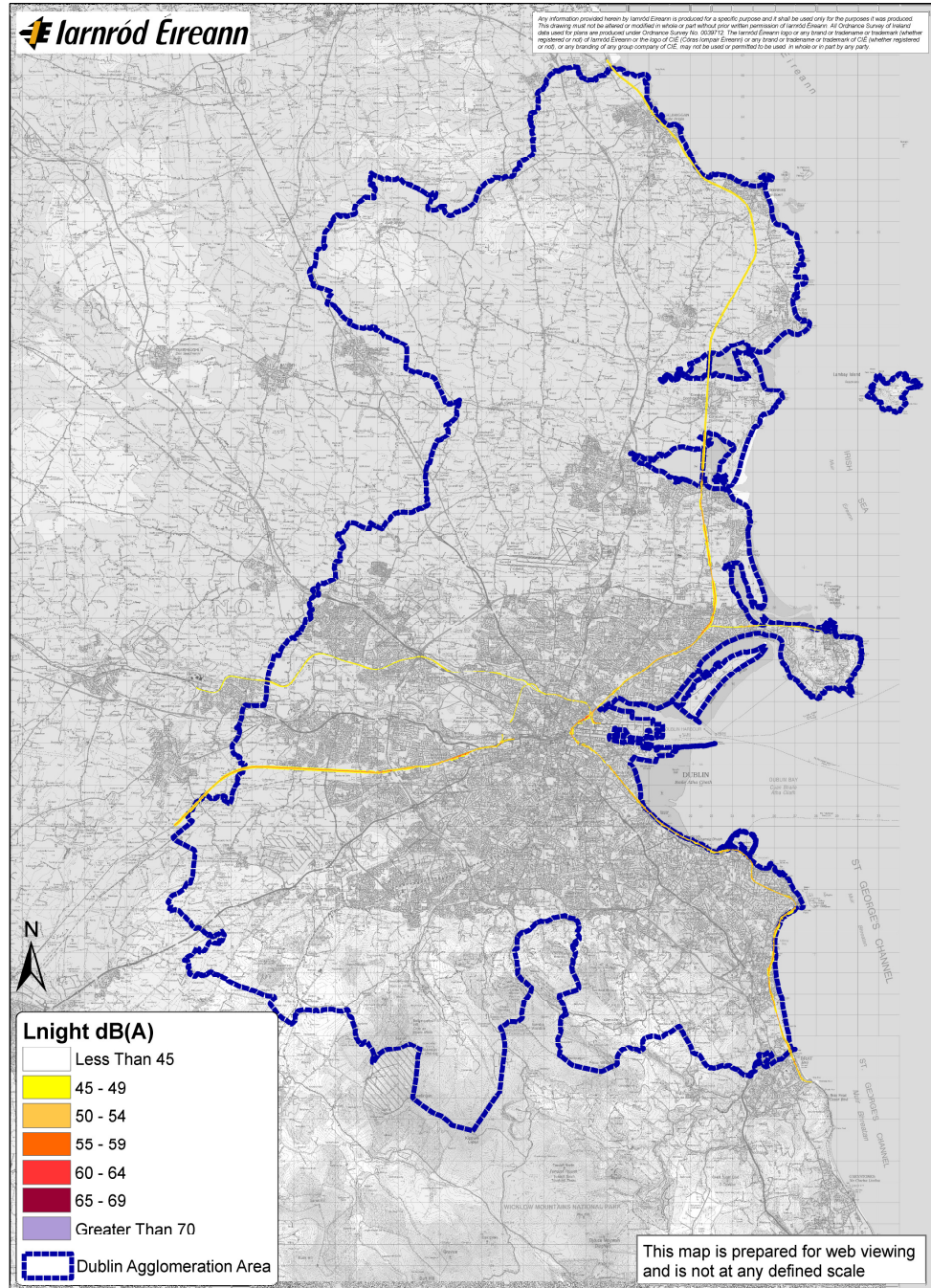


Figure D.3 Strategic Noise Mapping for Major Railway L_{DEN}



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

Figure D.4 Strategic Noise Mapping for Major Railways L_{NIGHT}



Average 24 Hour Sound Values (L_{night}) from Dublin Irish Rail Line

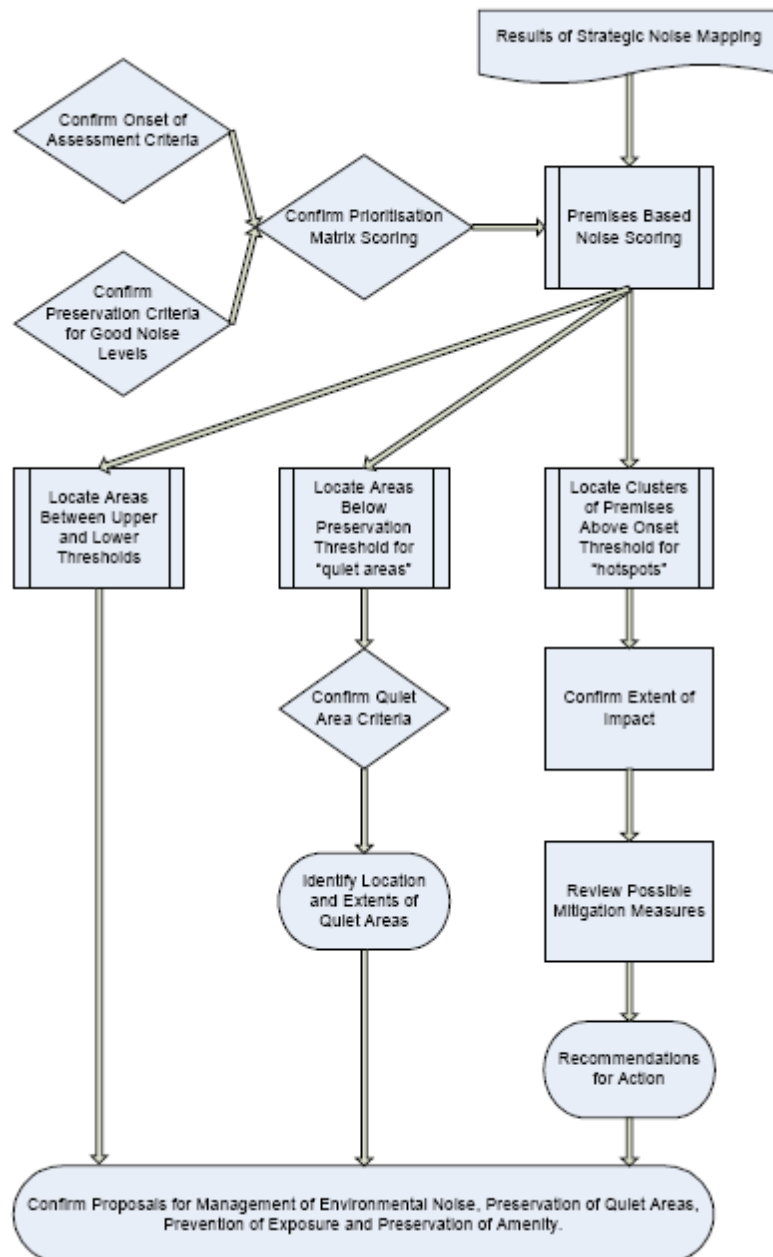
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Appendix E

Overview / Flow Diagram of Process for Action Planning
Decision Making

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Appendix F

Decision Support Matrix – Worked Example

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The following table presents a worked example of the Decision Support Matrix. The example is an arbitrary one using assumed data to achieve the relevant scoring.

Example - Main Street, Any Town

Noise Bands 70-74 dB L_{den} And 60-64 dB L_{night}

Location - Town Centre

Noise Source – Road Noise

Assessment Area		Score Range	Score Range	Sub total
		L _{den}	L _{night}	
Noise Band	<45 dB	5	6	
	45 - 49 dB	4	5	
	50 - 54 dB	3	4	
	55 - 59 dB	2	2	
	60 - 64 dB	1	3	3
	65 - 69 dB	2	4	
	70 - 74 dB	3	5	3
	75 - 79 dB	4	6	
	>80 dB	5	7	
Location	Town Centre	1	1	2
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive	3	3	
	Open Countryside	3	3	
	Recreational open space	2	2	
Source Type	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	7
Priority: High, Medium or Low		15		

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The final score in the worked example in the case is 15 which falls below the threshold of 17 which would require further assessment for potential mitigation measures.

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Appendix G

Outcome of Consultation Process

Wicklow County Council Noise Action Plan 2013

Statutory and other Bodies

The Draft Noise Action Plan 2013, Revision 0.01 was sent in electronic format to the following statutory bodies with a covering letter seeking submissions in relation to the contents of the Draft Noise Action Plan 2013, Revision 0.01.

Carlow County Council
Department of the Environment
Dublin City Council
Dun Laoghaire Rathdown County Council
Environmental Protection Agency
Iarnród Éireann
Kildare County Council
National Roads Authority
South Dublin County Council
Wexford County Council

Two Submissions were received shortly after the deadline for submissions which was set for the close of business on the 16th July 2013.

Dun Laoghaire Rathdown County Council in their email submission on the 17th July 2013 noted that they had no comments in relation to the plan which they regarded as “quite comprehensive”.

The National Road Authority in their letter of the 16th July 2013 (received on the 17th July 2013) noted a number of items in the document which required review and alterations. These mainly related to references to the centralised noise modelling approach adopted for modelling the major road network. These alterations in the text were in Section 1.4.1, Section 1.4.4, Section 3.5, Section 4.2 and Section 5.1.4. a query was also raised in relation to “relevant Stakeholders” in Section 10.3.2 and Tables 10.2, 10.3 and 10.4. A minor revision was also required to a reference in Section 12 and an interpretation of an NRA document in Section 2.1.2.

No other submissions were received from any other statutory body.

Public Consultation

The Draft Noise Action Plan 2013, Revision 0.01 was put on public display at Wicklow County Council offices and made available in electronic format on the Wicklow County Council website as detailed in Section 9.2. In order to effectively inform the public of the existence of the Draft Noise Action Plan 2013, a notice was placed in the locally circulating Wicklow People Newspapers on the 26th June 2013 inviting the public to make submissions on the Draft Noise Action Plan 2013 using the dedicated email address or in writing before the 12th July 2013.

During the submission period no email correspondence or letters were received from the public commenting on the contents of the Draft Noise Action Plan 2013.

One letter was received after the conclusion of the consultation period (dated 10th July 2013, and received on the 15th July 2013) from Q.E.D Engineering Ltd, an Engineering Consultant based in Monaghan outlining the services offered by the firm in relation to noise consultancy works.

One telephone message was left after the conclusion of the consultation period (15th July 2013 at 16.15) from a resident of Coynes Cross, which is located beside the N11 at the northern end of the Newtownmountkennedy to Ballynabarny RIS (N11 Ashford and Rathnew By-Pass). When the respondent was contacted (18th July 2013), the issues raised concerned the level of noise at the location and what proposals were proposed to ameliorate the noise from the N11. The respondent was advised that the Noise Action Plan 2013 detailed the proposed plan to manage noise for the duration of the Noise Action Plan.