

COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL

NOISE ACTION PLAN 2018



Clare County Council,
New Road,
Ennis,
Co Clare

July 2018

EXECUTIVE SUMMARY

This Noise Action Plan 2018 has been prepared by Clare County Council to address environmental noise from major roads with more than three million vehicles per annum. The action planning area covers the M18, N18, N19, N68, N85, Sections of R445, R458, R463, R352, R469, R471.

It is a follow up to the 2013 Noise Action Plan which addressed environmental noise from roads with more than three million vehicles per annum and the 2008 Noise Action Plan which addressed environmental noise from roads with more than six million vehicles p.a.

The plan has been prepared in accordance with the requirements of EU Directive 2002/49/EC (known as the Environmental Noise Directive, or "END"), which was transposed into Irish Law by the Environmental Noise Regulations 2006, SI No. 140 of 2006.

The aim of the Directive and the Regulations is to provide for the implementation of an EC common approach to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise.

Environmental noise is 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.

According to the World Health Organisation in 2011 " Environmental noise leads to a disease burden that is second in magnitude only to that from air pollution, among environmental factors in Europe".

The Report ' Noise in Europe 2014' EEA no 10/2014 by the European Environment Agency indicated that exposure to noise in Europe contributes to:

- Over 910,000 cases of hypertension caused by environmental noise each year,
- The total number of hospital admissions related to coronary heart disease and stroke is estimated to be 43 000 per year due to noise.
- About 10,000 premature deaths from heart disease & stroke per year could be related to noise exposure

Noise Mapping Bodies and Action Planning Authorities were assigned responsibility under the regulations to draw up noise maps for the third round in 2017 and prepare action plans for noise from the following noise sources:

- sections of rail route above a flow threshold of **30,000** train passages per year. (No sections in Clare)
- major airports with more than **50,000** movements per year -a movement being a take off or landing. (Not applicable to Clare at present).
- Sections of major roads with a flow threshold of **3 million** vehicles per annum.
- agglomerations with more than **100,000** inhabitants. (Not applicable to Clare)

Transport Infrastructure Ireland (TII) formerly the National Roads Authority (NRA), as the noise mapping body for major national roads, has prepared noise maps for the sections of the National Routes – (M and N routes) in Clare that were confirmed by verified vehicle count data to have more than **3** million vehicles per annum. TII on behalf of Clare County Council has prepared noise maps for Regional roads (R route) with more than **3** million vehicles per annum. TII has estimated from the noise maps and from geodirectory data that approximately **6,629** individuals living within the action planning area in Clare may be located in environmental noise bands from 55 to >75dB L_{den} . Approximately **4,279** individuals may be located in noise bands from 50 to >70dB L_{night} .

The purpose of this Action Plan is to endeavour to manage the existing noise environment and protect the future noise environment within the action planning area. Management of the existing noise environment may be achieved by prioritizing areas for which further assessment and possible noise mitigation may be required. Protection of the future noise environment may be achieved by acoustical planning, which further incorporates noise into the planning process via measures such as land-use planning, development planning, sound insulation measures, traffic planning and control of environmental noise sources.

ACTION PLAN POLICY STATEMENT

Clare County Council will seek to address environmental noise from major roads in the county, will endeavour to maintain satisfactory noise environments where they exist and will have regard to acoustical planning in the planning process (within the confines of the Planning and Development Act as amended) to endeavour to ensure that future developments include provisions to protect the population from the effects of environmental noise in the interests of residential amenity and public health.

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Strategic Noise Maps

1.0 BACKGROUND/INTRODUCTION

1.1 Purpose and Scope of the Environmental Noise Directive.

EU Directive 2002/49/EC (known as the Environmental Noise Directive, or "END") deals with the assessment and management of environmental noise¹.

The aim of the directive is to:

"Define a common approach intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise."

The Directive requires that Member States:

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 a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health, and to preserving environmental noise quality where it is good.

The Directive defines noise mapping, strategic noise maps and action plans as:

Noise Mapping – shall mean 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.

Strategic Noise Map – shall mean a map designed for the global assessment of noise exposure in a given area due to different noise sources or for overall predictions for such an area.

Action Plans- shall mean plans designed to manage noise issues and effects, including noise reduction if necessary.

1.2 Purpose and Scope of the Environmental Noise Regulations.

END was transposed into Irish Law by the Environmental Noise Regulations 2006. The regulations provide for the implementation of a common approach within the European community intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise.

For the purposes of the Directive and Regulations, environmental noise is 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.

Round One.

Noise mapping bodies made 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.
- Major airports with >50,000 movements per annum.
- Agglomerations with >250,000 inhabitants.

Round 1 Final Noise Action Plan was submitted by Clare County Council to the EPA on the 31st October 2008 on foot of a public consultation process. The final deadline for reporting of Action Plans to the European Commission was the 18th January 2009.

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

Round Two.

Phase two provides for noise mapping bodies to make strategic noise maps 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).
- Major airports with >50,000 movements per annum.
- Agglomerations with > 100,000 inhabitants.

A draft Noise Action Plan was submitted to the EPA on 1st March 2013.

The draft Plan went to Public Consultation and then the Plan was finalised and approved by Clare County Council in July 2013.

The EPA was to submit a summary of the Noise Action Plan to the European Commission by 18th January 2014.

Round Three

Phase three provides for noise mapping bodies to make strategic noise maps 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).
- Major airports with >50,000 movements per annum.
- Agglomerations with > 100,000 inhabitants.

The final Clare Noise Action Plan 2018 is required to be in place in July 2018.

1.3 Roles and Responsibilities of designated bodies.

The Environmental noise regulations designate noise mapping bodies and action planning authorities for the making of strategic noise maps and noise action plans as follows:

1.3.1 Noise Mapping Bodies:

- For major national roads, Transport Infrastructure Ireland (TII) formerly the NRA, is the noise mapping authority, on behalf of the action planning authority concerned.
- For major non-national roads, each local road authority is the noise mapping authority concerned, therefore Clare County Council is designated for County Clare.
- For major airports, the relevant airport authority is the noise mapping body, on behalf of the action planning authority concerned.
- For major railways, Iarnrod Éireann or TII, as appropriate, is the noise mapping body on behalf of the action planning authority concerned.
- For the agglomeration of Dublin, Dublin City and County Councils
- For the agglomeration of Cork, Cork City and County Councils.

1.3.2 Action Planning Authorities

The Action Planning Authorities are the Local Authorities within whose functional areas the major road/railway/airport/agglomerations are located.

- Each local authority is the action planning authority for major roads in the local authority area, therefore Clare County Council is the action planning authority for major national and major non national roads in County Clare.

1.4 Key Phases.

1.4.1 Identification of areas to be mapped

In Clare, strategic noise maps and associated action plans must be prepared for major roads only. The requirements for major railways, major airports or agglomerations of greater than 100,000 don't apply.

The definition of a major road for this second and this, the **third** noise mapping/action planning phase of the Regulations is a road with more than **3** million vehicles per annum.

For Round 1 the NRA identified the N18 from the Limerick border up to 3km north of Ennis town as the only major road in Clare with this level of vehicle movement, based on traffic count data for 2005. Clare County Council did not identify any regional road as being above the 6 million vehicle threshold.

For **Round 2** the NRA identified the following routes with more that 3 million vehicles pa:

- the M18 motorway from Smithstown Interchange to Galway border
- the N18 from Limerick border to Smithstown Interchange
- the N19 from Smithstown Interchange to Shannon Airport entrance
- the N68 from Ennis to Kilrush
- A section of the N85 from Killow Interchange via Lehinch Road Roundabout, Ennis to the N85 junction with the R476

Clare County Council identified the following Regional Roads with more than 3 million vehicles per annum:

- R445 - from Limerick border to N18 junction (old N18)
- R463 - from Limerick border to R463/R465 junction
- R471 - Shannon Town Centre Roundabout to Ballycasey Roundabout (old N19)
- R458 - R458/N85 Clareabbey Roundabout to Ballycorey Junction through Ennis (old N18)
- R352 - R352/N85 Clareen Roundabout to R352/R458 Maid of Erin Roundabout
- R352 - R352/R871 Junction to Ballymacahill Cross
- R469 - Ennis Cathedral to Junction to Industrial Estate
- R871 - R871/R458 Junction to R871/R352 Junction
- R912 - Abbey Street in Ennis

For Round 3 Clare County Council identified the following Regional Roads with more than 3 million vehicles per annum:

- R445 - from Limerick border to N18 junction (old N18)
- R463 - from Limerick border to R463/R465 junction
- R471 - Shannon Town Centre Roundabout to Ballycasey Roundabout (old N19)
- R458 - R458/N85 Clareabbey Roundabout to Ballycorey Junction through Ennis (old N18)
- R352 - R352/N85 Clareen Roundabout to R352/R458 Maid of Erin Roundabout
- R352 - R352/R871 Junction to Ballymacahill Cross
- R469 - Ennis Cathedral to Junction to Industrial Estate

See AADT figures below for 2016 which was regarded as a typical year.

Location	AADT 2016
R445 - from Limerick border to N18 junction (old N18)	
Southbound carriageway	10012
Northbound carriageway	10012
R463 - from Limerick border to R463/R465 junction Zones A,B,C	
R463 Zone A	12903
R463 Zone B	9792
R463 Zone C	8014
R469 Quin Road in Ennis Zones A,B,C	
R469 Zone A	8463
R469 Zone B	8463
R469 Zone C	7850
R471 - Shannon Town Centre Roundabout to Ballycasey Roundabout (old N19)	9569
R475 Kilrush Road, Ennis	7083

Location	AADT 2016
R458 - R458/N85 Clareabbey Roundabout to Ballycorey Junction through Ennis (old N18) Zones A,B,C,D,E,F	
R458 Zone A	13315
R458 Zone B	14446
R458 Zone C	9011
R458 Zone D	12469
R458 Zone E	13917
R458 Zone F	14266
R352 - R352/N85 Claireen Roundabout to R352/R458 Maid of Erin Roundabout Zones A,B,C,D,E,F	
R352 Zone A	11811
R352 Zone B	6248
R352 Zone C	7529
R352 Zone D	13047
R352 Zone E	10344
R352 Zone F	8947
R871 Clon Road, Ennis	8177
R912 Abbey St in Ennis	6940

1.4.2 Preparation of Strategic noise maps

1.4.2.1 Purpose

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 under 1.2 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. The maps have been linked to population data to estimate the numbers of people located in each environmental noise bands. 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.

1.4.2.2 Preparation

TII ran computerised noise modelling programmes for the relevant roads with volumes above 3 million vehicles per year and generated GIS grids of noise levels as an output of the noise modelling process.

TII generated GIS polygon contour layers for the following decibel bands for Lden and Lnight:

Lden	Lnight
➤ 55-59	45-49
➤ 60-64	50-54
➤ 65-69	55-59
➤ 70-74	60-64
➤ >/=75	65-69
	>/=70

Lden (day-evening-night noise rating indicator) shall mean the noise indicator for overall annoyance. This comprises of adding the average value for the 12 hour day time period with the average value of the 4 hour evening period plus a 5 decibel weighting or penalty, and the average value for the 8 hour night time period with a 10 decibel weighting or penalty.

Lnight (night-time noise indicator) shall mean the noise indicator for sleep disturbance. This is the average value in decibels for the night time period.

See Appendix 1: Glossary of other acoustic and technical terms.

The resultant noise maps are a visual representation of the estimated noise level bands within each action plan area.

1.4.3 Development of noise action plans.

1.4.3.1 Purpose.

The purpose of the action plans is to manage environmental noise from the major sources, to improve noise levels where necessary on a prioritised basis, to preserve satisfactory noise environments where they exist and to protect the future noise environment.

1.4.3.2 Scope

The local authority areas covered by the noise action plans are those areas identified by noise mapping as being affected by environmental noise from the major noise sources. The action plans refer to places near the major noise sources i.e. major roads, major railways and major airports and within any relevant agglomeration. The noise from these sources is regarded as affecting an Action Plan Area if it causes either an L_{den} value of 55dB(A) or greater or an L_{night} value of 45dB(A) or greater anywhere within an area.

1.4.3.3 Public participation

The Environmental Noise Directive and the Noise Regulations provide for strategic noise maps and action plans to be made available to the general public. They also provide for public consultation on proposed action plans and for the results of public consultation to be taken into account in finalizing action plans.

Article 11(6) of the END imposes the following duty on member states in relation to public consultation:

- *Member States shall ensure that the public is consulted about proposals for action plans, given early and effective opportunities to participate in the preparation and review of the action plans, that the results of that participation are taken into account and that the public is informed on the decisions taken. Reasonable time frames shall be provided allowing sufficient time for each stage of public participation. If the obligation to carry out a public participation procedure arises simultaneously from this Directive and any other Community legislation, Member States may provide for joint procedures in order to avoid duplication.*

Regulation 12(2) of SI 140 of 2006 provides that:

- *Information for the public on noise maps and action plans shall be clear, comprehensive and accessible and shall include a summary of the most important points.*

Over and above the statutory requirement to seek input from the public and other relevant stakeholders in preparation of the final Noise Action Plan, it is the policy of Clare County Council to maintain good communication with the general public and other stakeholders in all areas. An Objective of the Clare County Council Corporate Plan (2015 to 2019) is "Enhancing Democracy-Work within a framework of democratic principles to facilitate optimum public participation and community involvement". One of the supporting strategies to this objective is to increase openness, accessibility and communication channels regarding Local Authority activities.

The document "Consultation Principles and Guidance November 2016" by the Dept. Of Public Expenditure and Reform was consulted and the main principles are being complied with. The draft Plan is advertised in a local newspaper and on the CCC website. The summary makes the document accessible.

1.4.4 Implementation of the Action Plan

Mitigation and protection measures detailed in Section 7 of this Action Plan will be implemented if required and if funded, on a prioritized, phased basis over the five-year life of the Plan. Monitoring measures may be undertaken where noise-mapping data must be verified by measurement prior to the implementation of any corrective action.

1.4.5 Directive 2001/42/EC: Assessment of the Effects of Certain Plans and Programmes on the Environment

Environmental significance screening is undertaken to assess if a plan or programme is likely to result in environmental impacts, and warrants a Strategic Environmental Assessment (SEA). The Noise Action Plan is effectively a strategic policy document and reflects the wider context of local national sustainable development plans and will adhere to the requirements of the Clare County Development Plan. It is not envisaged that there will be a requirement for a Strategic Environmental Assessment (SEA), however the action plan will be subject to an ongoing review and this will be determined during the reviews. At this stage in the preparation of the Noise Action Plan it has been determined that as it is not listed in the mandatory or screening categories of the regulations, an SEA is not required. Article 3(2) of the SEA Directive makes SEA mandatory for plans or programmes which are prepared for eleven different sectors; agriculture, forestry,

fisheries, energy, transport, industry, tourism, land use, telecommunications, waste management, or water management.

2.0 Existing noise management legislation and guidance

2.1 National Legislation and guidance

The Environmental Noise Regulations are concerned with community or environmental noise, which is classified in the draft I-INCE publication "A Global Approach to Noise Control Policy" as follows:

Community/Environmental Noise

Unwanted sound in a non-occupational setting, indoors or outdoors, caused by sources over which an individual has little or no control, including sounds produced by neighbours.

Many different noise sources contribute to community/environmental noise, including:

- Roads, railways, airports, industry or recreational activities adjacent to residential properties or noise sensitive premises such as schools or hospitals, or recreational spaces.
- Noisy neighbours, barking dogs.
- Gardening machinery, construction activities, ice cream vans, street cleaning, delivery vehicles.
- Air-conditioning equipment.
- Public house, nightclubs, restaurants or other recreational activities.
- Industrial operations, workshops and factories.

Location of new residential properties or noise sensitive premises such as schools or hospitals, adjacent to existing roads, railways, airports, industry or recreational activities can result in significant noise management issues as can the development of mixed residential/commercial use buildings, and multi-part residential buildings.

Noise sensitive locations such as schools, hospitals, churches, funeral homes, have particular requirements for low level noise environments in order to be able to function effectively. Noise levels in these noise sensitive locations must be managed to address external noise break-in, as well as room-to-room transmission. A high standard of insulation can be applied to improve noise attenuation in these buildings but this measure is rendered relatively ineffective when windows are opened. It also does not protect the external environment around the noise sensitive location from community/environmental noise.

2.2 Current Community Noise Management Situation

The EPA notes in the Guidance Note for Noise Action Planning that "*at present there is no clear official or statutory guidance which could help promote the effectiveness or clarity of the provisions within the Act; however, within the framework of the Regulations the EPA may consider it appropriate to develop such guidance in the future*". The measures in place at present which

address particular aspects of community noise are outlined in the following sections (2.2.1 to 2.2.7):

2.2.1 Environmental Protection Agency Act 1992

The existing statutory provisions have primarily come about on foot of the Environmental Protection Agency Act of 1992. Sections 106 to 108 of the Act are of direct relevance, and may be summarised as follows:

- **106** gives the relevant Minister certain powers to regulate noise that may give rise to a nuisance or be harmful to health or property;
- **107** gives powers to local authorities and the EPA to serve notice to take steps to control noise;
- **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. S108 enables private individuals to take a case to the courts at very low financial cost. This procedure is recommended for use by the public, particularly where the problem is caused by noisy neighbours in privately owned or rented accommodation.

In relation to general neighbourhood noise problems, Clare County Council encourage complainants to exert their rights under The Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 (S.I. No. 179 of 1994), which provides straightforward access to the Courts by individual or groups concerned about excessive noise³.

2.2.2 IPPC and Waste Licensing

Noise conditions are routinely imposed as part of an IPPC licence. The relevant guidance is set out in the EPA publication "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in relation to scheduled activities*" published by EPA January 2016. This document contains suggested noise limits of 55 dB(A) L_Ar,T for daytime and 45dB(A) L_Aeq,T for night-time; with said limits to be applied to "*sensitive locations*". Whilst these limits have a very specific application, they have appeared in many different contexts and often form the basis for conditions in planning permissions. Similar noise conditions are also imposed on waste-licensed facilities.

2.2.3 Waste Permitting

Clare County Council imposes noise conditions on waste permitted facilities where noise is considered to be a potential issue. These conditions are similar to the EPA waste licence conditions referred to above.

2.2.4 Wind Energy Development Guidelines

With specific regard to wind energy developments, this Department of the Environment, Heritage and Local Government document suggests a "*lower fixed limit of 45dB(A) or a maximum increase*

of 5dB(A) above background noise at nearby noise sensitive locations". Separate noise limits should apply for day-time and for night-time. During the night the protection of external amenity becomes less important and the emphasis should be on preventing sleep disturbance. **A fixed limit of 43dB(A) will protect sleep inside properties during the night. "**

2.2.5 Quarries and Ancillary Activities

Section 261 of the Planning and Development Act as amended introduced a new system of one-off registration for all quarries. Only those quarries for which planning permission was obtained in the 5-year period before S261 became operational were excluded. The Department of the Environment published guidelines for Planning Authorities for quarries and ancillary activities in April 2004, including recommended noise conditions for inclusion as part of registration or where a full planning permission was required. A total of 208 quarries in Clare applied to register. Depending on the complexity of the quarrying operation, noise conditions were included as part of the registration process and as part of the planning process for quarry extension applications. For larger quarry operations, environmental noise conditions along the following lines have been imposed by the planning authority: *Noise emissions from the facility shall not exceed 55dB(A)LA_{eq, 30 mins} during the daytime and 45 dB(A)LA_{eq, 15 min} during the night time at the façade of the nearest noise sensitive locations, subject to adjustment in the event of a change in the accepted limits for industrial noise.*

Noise and vibration conditions have also been imposed for quarries in which blasting is carried out. These conditions generally state: *"Vibration levels from blasting shall not exceed a peak particle velocity of 12 mm/second, measured in any three mutually orthogonal directions at any sensitive location. Blasting shall not give rise to air overpressure values at sensitive locations which are in excess of 125 d(B)(Lin)_{max peak} with a 95% confidence limit. No individual air overpressure value should exceed the limit value by more than 5 dB (Lin).*

2.2.6 Building Regulations

The current Irish Building Regulations 2014 Technical Guidance Document E calls for certain constructions to offer "reasonable resistance" to both airborne and impact sound.

' Part E does not address environmental noise through the building facade from external sources such as aircraft, trains, road traffic or industry.'

'Additional guidance is provided in BS 8233 Sound Insulation and noise reduction for buildings - Code of practice and sound control for homes.'

2.2.7 Planning.

Aside from the guidelines for quarries, there is currently no national policy or guidance to address noise issues as part of the planning process. Clare County Council will set conditions relating to noise as part of a planning permission where the planning authority considers that noise issues need to be addressed.

The NRA (now TII) produced ' Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes ' in March 2014.

The Department of Housing, Planning and Local Government has published the following documents relating to sustainable development in the urban environment⁴:

- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities DRAFT UPDATE December 2017
- Spatial Planning and National Roads – Guidelines for Planning Authorities January 2012
- Guidelines for Planning Authorities on Sustainable Residential Developments in Urban Areas (Cities, Towns, Villages) May 2009
- Design Manual for Urban Roads and Streets Dept of Transport , Tourism and Sport 2013

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: "*Privacy is an important element of residential amenity*". Whilst they are not mentioned specifically, environmental noise and noise transfer between dwellings are both key considerations in respect of amenity and privacy.

Spatial Planning and National Roads – Guidelines for Planning Authorities states '*Planning authorities should engage with applicants and their agents to address, as an integral element of their development proposals, potential negative impacts arising from existing or planned national roads. This could include mitigating impacts through appropriate design of buildings, landscaping features and site layout as part of the development proposal.*'

'The Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006) should be taken into account within the development plan and development management processes, as well as relevant noise maps and noise action plans prepared under the Regulations for specific roads.'

'The Regulations apply to national and non-national roads with traffic volumes above a prescribed level. Accordingly, all proposals in respect to noise sensitive developments within the zone of influence of such existing or of planned new roads should identify and implement, where appropriate, mitigation measures in relation to noise and other effects listed above. The costs of implementing the mitigation measures concerned should be borne by the developer'

Design Manual for Urban Roads and Streets states '*The main factors which determine the level of road noise and air pollution are traffic volume, speed, levels of congestion and the proportion of HGVs. Many of these issues may be substantially addressed by*

directing large volumes of traffic (and in particular HGVs) away from cities, towns and villages via Urban Relief Routes (see Section 3.4.4 Relief Roads) and by reducing speeds (see Table 3.2). The creation of a permeable street network which promotes walking, cycling and public transport will also lead to reductions in vehicular traffic and less concentration of traffic and consequently of noise and air pollution’.

SPEED AND NOISE REDUCTION

Speed Reduction	dB (A) Reduction
from 70-60 km/h	1.8
from 60-50km/h	2.1
from 50-40km/h	1.4

TRAFFIC AND NOISE REDUCTION

Traffic Volume Reduction	dB (A) Reduction
30%	1.6
40%	2.2
50%	3.0
75%	6.0

Table 3.2 of DMURS 2013

Pro PG May 2017

A document titled Pro PG Planning and Noise Professional Practice - Guidance on Planning & Noise for New Residential Development was published in 2017 in the UK. This may provide a useful reference guide to those in Clare County Council involved in considering development proposals.

2.2.8 Conference of European Directors for Roads

The following is an extract from EPA Guidance Feb 2018:

In 2017 CEDR published the following three reports.

- Technical Report 2017-01: State of the art in managing road traffic noise: noise-reducing pavements
 - Technical Report 2017-02: State of the art in managing road traffic noise: noise barriers
 - Technical Report 2017-03: State of the art in managing road traffic noise: cost-benefit analysis and cost-effectiveness analysis
- In 2017 TII commenced work to produce the following two Standards Documents:

- A Standards Document regulating the noise impact assessment of 'Proposed National Roads'; and
 - A Standards Document regulating the management of noise and vibration during the construction stage
- These two Standards are scheduled for dissemination in Q4 2018.
- EPA Network
 - Progress report on measures on road traffic noise in the EU, March 2012
 - Progress report on measures on rail traffic noise in the EU, June 2014
 - Progress report on aircraft noise abatement in Europe v3, July 2015

2.2.9 Health

The World Health Organisation has said in 2011 that 'Environmental noise leads to a disease burden that is second in magnitude only to that from air pollution, among environmental factors in Europe'.

The Report 'Noise in Europe 2014' EEA no 10/2014 by the European Environment Agency indicated that exposure to noise in Europe contributes to:

- Over 910,000 cases of hypertension caused by environmental noise each year,
- The total number of hospital admissions related to coronary heart disease and stroke is estimated to be 43 000 per year due to noise.
- About 10,000 premature deaths from heart disease & stroke per year could be related to noise exposure

WHO-Europe is currently in the process of finalising the WHO Environmental Noise Guidelines which will include a review of evidence on the health effects of environmental noise such as: sleep disturbance, annoyance, cognitive impairment, mental health and wellbeing, cardiovascular diseases, etc. The guidelines will assess several environmental noise sources such as aircraft, rail, road and wind turbines, and will review the evidence on health benefits from noise mitigation and interventions to decrease noise levels. The publication date for these new WHO guidelines has still to be agreed.

The following reports could provide a broad understanding of the impact of noise on health, and methodologies developed to estimate the burden of disease on the exposed population:

- EEA - Good Practice Guide on Noise Exposure and Potential Health Effects 2010
- WHO - Burden of Disease from Environmental Noise 2011
- WHO - Methodological Guidance for Estimating the Burden of Disease from Environmental Noise 2012
- EEA & JRC - Environment and Human Health 2013
- RIVM - Health Implication of Road, Railway and Aircraft Noise in the European Union 2014

There was a European Commission Noise Conference in April 2017, where the WHO outlined the latest findings on the health implications of noise. The European Environment Agency (EEA) outlined the exposure that European citizens face from harmful levels of noise.

The EPA are commencing an Environmental Noise & Health Research project. They have stated that:

“It will provide a state of knowledge review of the relationship between environmental noise and health/wellbeing, and provide a national estimate of the burden of disease from environmental noise in disability-adjusted-life-years (DALYs). The plan is to combine noise modelling and health microdata to examine causal relationships between noise exposure and health and wellbeing outcomes at the city-wide scale for Dublin and Cork, and to develop recommendations and guidelines for the integration of noise considerations into relevant policy streams.”

A health Assessment will be considered in Round 4 in accordance with guidance from the EPA.

2.3 County Planning Policy -

2.3.1 Clare County Development Plan 2017 to 2023

The Clare County Development Plan **2017 to 2023** sets out objectives in relation to transport, environment and development management which directly and/or indirectly influence the impact of noise.

“CDP8.33 Development Plan Objective: Noise Pollution

It is an objective of the Development Plan:

To ensure that all proposals for development related to transportation infrastructure comply with the provisions of the ‘Clare Noise Action Plan (2013)’ and any subsequent plans.”

Table 8.2 shows Proposed Projects identified for Future Development.

It seeks to provide roads projects identified in Table 8.2 and ensures that such projects are designed and constructed to fulfil their intended purpose.

In Section 8.2.6 it is stated “Objectives in this Development Plan to support walking and cycling, green infrastructure development, active living and sustainable residential development all contribute to the achievement of the goals of the Smarter Travel programme.”

Noise impacts are required to be addressed in Traffic and Transport Assessments for large developments. When assessing planning applications the Roads section consults the noise maps and advises accordingly.

In relation to developments alongside distributor roads, the Roads authority has mapped setback distances to ensure that noise levels are at an acceptable level at the houses close to such roads.

When the Clare County Development Plan 2017 to 2023 is up for review the guidance and objectives in relation to noise can be reviewed and amended as necessary.

3 Description of the Action Planning Area

3.1 County Clare.

Clare is located on the west coast of Ireland and is bounded to the west by the Atlantic Ocean and to the east and south by Lough Derg and the Shannon River and Estuary. The diversity of landscapes in the county range from the uplands of Slieve Aughty and Slieve Bernagh in the east across the central lowlands around Ennis to the gently sloping topography of the western side of the county. The Burren, a unique and renowned karst limestone region, is located in the northwest of the county. Land use in Clare is predominantly agricultural in nature. Approximately 10% of the land is under forestry.

3.2 Population Data:

Ennis town is the largest urban centre in Clare with a population of 25,276 in 2016 (20,180 in 2011). Shannon Town is the second largest town in the county, with a population of 9,729 in 2016 (9,673 2011).

Table 1: Census Data for Clare

Year	Total Population	Rate of change in population since last census	Town	Rural
1996	94,006	+6.7%	46,116	47,890
2002	103,277	+15.7%	52,787	50,490
2006	110,950	+8.2%	43,391	67,559
2011	117,196	+5.62%	46,381	70,815
2016	118,817	+1.38%	46,654	72,163

3.3 Transport Infrastructure in Clare

3.3.1 Road Network

There are approximately 4,142km of roads in Clare. There are two national primary routes; the N18 - Limerick to Galway Road with Motorway designation from Smithstown Interchange (near Shannon) northwards to the Galway border and the N19, from the Smithstown Interchange into Shannon airport. There are three national secondary routes in the county (N67, N68 and N85). The majority of the road length (94%) is made up of regional and local roads, a reflection of the predominantly rural nature of the county. Traffic count data 2016 indicated that traffic flows along all parts of the National Primary some parts of the National Secondary and regional routes were above the 3 million vehicles per annum threshold for noise mapping/action planning specified for the second round of implementation of the Regulations.

3.3.2 Rail Network

Through County Clare train services operate on the Ennis to Limerick line and the Ennis to Galway line. Figures received from Iarnrod Eireann indicate that there were 6812 movements in 2013 and 2015 and 6800 in 2014. These values are all below the threshold of **30,000** trains per year and therefore noise mapping/action planning is not required.

3.3.3 Air Transport

Shannon airport is an international airport situated in the south of the County. There were a total of **23904** movements of aircraft into and out of the airport in 2013, with 25823 in 2014 and 23289 in 2016. These included commercial, cargo and training flights. A major airport is defined in the legislation as a civil airport that has more than **50,000** movements per year (a movement being a take-off or a landing), excluding those purely for training purposes on light aircraft. Shannon Airport flight movements are below the threshold for noise mapping/ action planning for this round.

3.3.4 Bus Transport

Bus Eireann operates an express bus service between Cork and Galway that serves Ennis. Citylink operates an express bus service between Cork and Galway that also serves Ennis. Bus Eireann also provides an infrequent service from Ennis to north and west Clare and a regular service to Shannon Airport. This is the only local bus route in the Plan area with bus stops between Ennis and Clarecastle. Clare Accessible Transport and East Clare Accessible Transport are a community-based organisation that serves some of the rural parts of the Ennis area and the east of the county.

3.4 Extent of Action Planning Area

The Clare action planning area is defined from the legislation as the area affected by noise from a major road carrying greater than **3** million vehicles per annum. Vehicle count data was obtained from Clare County Council's roads' surveys and TII surveys for the M18, N18, N19, N68 and N85. TII data identified the M18, N18, N19, Part of the N85, and the N68 as major roads which needed to have noise mapping. Clare County Council identified parts of the R445, R463, R471, R458, R352, R469, as roads which needed noise mapping. See more detailed descriptions in Section 1.4.1

The exact action planning area is a clearly defined stretch of these roads including lands on both sides of the road. The boundary of the lands is not defined by distance from the road noise source but rather it is the land area defined by computer modelling to be affected by noise levels of greater than 45dB(A) L_{night} and/or 55dB(A) L_{den} .

4.0 Responsible Authority for Action Planning

4.1 Name and Contact Details

Clare County Council,
Roads Section,
Áras Contae an Chláir,
New Road,
Ennis,
Co. Clare.
Telephone number : 065 6846479
Fax number: 065 6821915
Email: rdo@clarecoco.ie

4.2 Description of other bodies of relevance.

The Local Roads Authority ie Clare County Council is responsible for the maintenance and upkeep of non-national routes. The primary goal of the Roads Authority is to keep the roads safe. The Roads section in consultation with TII undertakes traffic calming measures where warranted by high vehicle speed and numbers passing through settlement areas and accident statistics.

4.3 Description of noise reduction measures already in place.

The single most effective noise reduction measure already in place in the action planning area is the construction of the Ennis bypass, which opened to traffic in January 2007. Round 1 mapping ended at Ballycorey , just north of Ennis. The N85 western relief road opened in April 2008. When the Round 1 and 2 noise maps are compared it is evident that the old N18 through Ennis, now the R458, has benefited by a reduction in noise levels of 5db Lden through much of its length.

Two Ennis Secondary Schools are adjacent to the old N18 and will have benefited from these noise reductions. Looking at St Flannans College , a 1300 pupil secondary School adjacent to the R458 - old N18 , part of the School was in the 65-69 dB Lden band in 2008 . Note the contours are derived from 2006 traffic data. In the 2013 plan, only a very small part of the east façade is in the 60-64 dB Lden band with the majority of the School <55 dB Lden. In the latest mapping the school building is in the 55-59 dB Lden .Therefore a significant reduction is evident.

The Ennis Active Travel Town scheme implemented in Autumn 2016 has the aim of reducing short car trips by encouraging more people to walk and cycle ie aim to reduce traffic volumes. Counts conducted since have shown a small increase in walking and cycling in Ennis town. CCC requests Mobility Management Plans as part of the planning application process for large developments eg schools. The plans are required to have target for car trip reduction. This ensures that measures are put in place to reduce traffic in the vicinity of schools in Clare. In the County Development Plan buffer zones are indicated within which housing is not permitted eg adjacent to the N85 in Ennis. All of these measures will contribute to reduction in noise levels at existing and future housing areas.

The Gort to Crusheen scheme opened in November 2010. This bypassed Barefield and Crusheen. Traffic calming measures have been implemented in the county as required, including at two locations on the old 18 now R458 , in Barefield and in Crusheen. In addition to the primary road safety benefit of these measures, they also effect a reduction in road noise because of the lower noise levels produced by slower moving vehicles.

Noise barriers were installed on the Ennis Bypass at Manus south of Clarecastle.

5.0 Summary of noise mapping results.

5.1 Overview of the preparation of the noise map

The roads identified as falling above the 3 million threshold have been listed in Section 1.4.1.

The Environmental Noise Regulations require TII to develop noise mapping for National roads and Clare County Council is required to develop noise mapping for regional roads.

A centralised approach to noise mapping of roads over the 3 million threshold was adopted. The developed noise maps for national roads and for regional roads TII developed noise mapping on behalf of Clare County Council.

In Clare, vehicle counts and classifications are obtained from fourteen-hour physical traffic counts carried out at approximately sixty locations on regional and national roads in the county. This data covers the years from 1989 to present and counts are conducted every year. These counts were used initially to identify the Regional roads above the 3 million threshold. Following on from this many roads and sections of roads were eliminated from the study.

In order to get more accurate data on individual roads, particularly in Ennis, it was decided to use a Radar counter which would yield data on speeds as well as volumes and vehicle lengths. Manual count data would not have included information on speed. The conditions under which the counts were undertaken were taken to represent the normal situation and were converted to AADT using TII Expansion Factors for Short Period Traffic Counts.

The strategic noise maps were prepared by TII using the recommended interim method of noise assessment set out in the second schedule of the Regulations. The model used was the UK national computation method "Calculation of Road Traffic Noise (CRTN), Department of Transport-Welsh Office, HMSO, London, 1998", adapted as set out in paragraph 2.1 of Annex II to the Directive. The model took account of information such as traffic flow data, vehicle type data, traffic speed, road width, road incline, road barriers and features which affect the spread of noise such as buildings and the shape of the ground (e.g. earth mounds), and whether the ground is acoustically absorbent (e.g. fields) or reflective (e.g. concrete or water).

TII generated GIS grids of noise levels as an output of the noise modelling process. GIS polygons were generated from the grids. The polygons are maps showing the noise contour bands in 5dB contours from 55dB to >75dB for Lden and from 45dB to >70dB Lnight.

5.2 Presentation of results.

5.2.1 Noise Contour Maps

The strategic noise maps for Clare are attached in Appendix VI. Each map shows contours of different noise bands, identifying areas that are relatively louder or quieter. The noise indicator contours shown on the noise maps are L_{den} and L_{night} . These are defined as follows (more detailed definitions can be found in Appendix I):

- L_{day} : The A weighted average sound level over the twelve hour day period of 0700-1900 h.
- $L_{evening}$: The A weighted average sound level over the 4-hour evening period of 1900-2300 h.
- L_{night} : The A-weighted average sound level over the 8-hour night period of 2300-0700 h.
- L_{den} : The day, evening, night rating level. L_{den} is a logarithmic composite of the L_{day} , $L_{evening}$, and L_{night} levels but with a 5 dB(A) weighting added to the $L_{evening}$ value and a 10 dB(A) weighting added to the L_{night} value.

The noise levels reflect an annual average 24-hour period. The L_{den} contours shown on the maps range from 55dB to 75dB in 5 contour bands. The L_{night} contours range from 45 dB to 70dB in 5 contour bands. Areas with noise levels of less than 55dB L_{den} and less than 45dB L_{night} are not mapped because these levels are below the threshold for inclusion under the legislation.

5.2.2 Summary Exposure Statistics

The population exposure methodology was prepared by the EPA during the noise mapping process. The method is described in Guidance Note for Strategic Noise Mapping For the Environmental Noise Regulations 2006 Version 2 August 2011 Revised Section 10: Methodology for Exposure Assessment - Post Processing and Analysis October 2017

By the ENVIRONMENTAL PROTECTION AGENCY" in Appendix II.

In summary, population exposure in each noise contour band was generated by cross referencing geodirectory locations with population data to create a set of population figures for each stretch of major road in the country. A summary report was provided to each local authority to assist in preparation of the action plans. The estimated population exposure results for Clare are shown in tables 2 and 3 below.

Table 2: Population Exposure Data, (L_{den})

Decibel Level Contour	Approx number of people
55-59	2748
60 - 64	2203
65 - 69	1290
70 - 74	388
> 75	0

Table 3: Population Exposure Data, (L_{night})

Decibel Level Contour	Approx number of people
50 - 54	2199
55 - 59	1643
60 - 64	429
65 - 69	8
> 70	0

The total action plan area is subdivided approximately as follows:

>55dB L_{den} 53 km²

>65dB L_{den} 12 km²

>75dB L_{den} 1.5km²

TII was the source of above data.

5.3 Limitations of the noise mapping process.

5.3.1 Limitations of the computer modelling method

The data used to generate the noise maps was obtained from computer modelling rather than from actual noise measurement. This approach is in accordance with the Noise Regulations. There are technical and practical reasons for using computer modelling in preference to noise measurement to produce noise maps: Noise levels at each monitoring location will generally result from a combination of different sources and physical measurement would not allow for the specific contribution from road noise to be determined. Furthermore, to produce a map based on measurements would require a large number of measurements to be made at each location over extended monitoring periods, at prohibitive expense.

The use of computer modelling to prepare noise maps is not a limitation of the noise mapping process because it is the method imposed under the Regulations. However, this noise mapping method does make it difficult to quantify the reduction in noise levels achieved by specific mitigation measures implemented at a local level. Without "before" and "after" noise monitoring results, improvements cannot be quantified. To address this limitation, Clare County Council proposes that where specific situations are identified for which mitigation measures may be required, a limited amount of noise monitoring will be conducted to confirm that noise levels are unsatisfactory. If mitigation measures are implemented, further monitoring will be carried out to quantify the effectiveness of the measures.

Data obtained from computer modelling is somewhat limited in that it provides a single annual average noise level and does not identify changing noise profiles over time.

5.3.2 Limitations of the vehicle count data

The noise mapping produced is based on counts taken in 2016. Further counts will ascertain if volumes are increasing or decreasing in each subsequent year.

6 Identification of areas to be subjected to noise management activities

6.1 Assessing and prioritising actions.

There are no statutory limits in place in relation to environmental noise exposures at EU or national level. The EPA recommends that the proposed onset levels for assessment of noise mitigation measures for noise due to road traffic should be as follows:

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

The proposed onset levels for assessment of noise level preservation for **quiet areas**, where the existing noise level is considered good are as follows:

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

In order to focus resources on areas in most need of improvement, a decision matrix will be applied, based on work carried out by Dublin Agglomeration. See Table 4 below. The final matrix score is determined based on three variables:

- 1. The calculated environmental noise level from the noise mapping data.**
- 2. The type of location e.g. town centre, commercial, residential.**
- 3. The noise source i.e. road**

1. Calculated environmental noise level.

The score under this variable is assigned based on the calculated L_{den} and L_{night} levels for the location.

2. Type of location.

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.

3. Noise Source

In Clare, the noise source is the same for all assessments i.e. noise from major roads.

It has been suggested in EPA Noise Guidance Document that each Action Planning Authority may impose an additional weighting factor to the matrix to include the number of residents at each address. However Clare County Council does not propose to impose this additional weighting for the following reasons:

- The number of residents at a particular location may change with change of ownership.
- While there may be only one or two residents at a particular address, their lifestyle habits may be such that they spend considerably more hours around the home than for example a large family where the adults are at work all day and children are at school.

Data obtained from the matrix tool will enable Clare County Council to prioritise actions. A matrix assessment score of **17** or greater will be taken to indicate that the threshold levels may have been exceeded and that the location should be included in the shortlist for further assessment.

Table 4. Matrix A: Decision Support Matrix to identify and prioritise noisy areas

Priority Matrix				
Location		Eg. <i>School Main Street</i>		
Decision Selection Criteria		Score Range		Sub Total
		L_{den}	L_{night}	
Noise Band	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75-79	4	6	
	>/=80	5	7	
Type of Location	Town centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive	3	3	
	Open countryside	3	3	
	Recreational open space	2	2	
Type of noise source				
	Road	3	4	
		Total score		

6.2 Preservation of noise levels in quiet areas and noise sensitive locations.

A quiet area in open country is defined as an area delimited by the action planning authority following consultation with the agency and approval by the minister, that is undisturbed by noise from traffic, industry or recreational activities. At present, there are no such areas identified in Clare for which noise mapping has been carried out therefore quiet areas are not relevant to this action plan.

Noise Sensitive locations are locations for which a quieter noise environment is preferable for effectively carrying out the functions of the particular location. They include schools, libraries, hospitals, nursing homes, funeral homes, churches and other places of worship.

Decision support Matrix 'B' can be applied - see Table 5 below - to identify noise sensitive locations, recreational open spaces or quiet areas for which mitigating measures may be required to preserve a good quality noise environment.

Table 5. Matrix B: Decision Support Matrix to preserve quiet areas

Priority Matrix				
Location				
Decision Selection Criteria		Score Range	Score Range	Sub Total
		L_{den}	L_{night}	
Noise Band	<45	0	0	
	45-49	1	2	
	50-54	2	3	
	55-59	3	4	
Type of Location	Noise Sensitive	3	3	
	Quiet area	3	3	
	Recreational open space	2	2	
Type of noise source				
	Road	3	4	
		Total score		

The noise maps will be examined to identify any noise sensitive locations situated within the action planning area. Any noise sensitive locations identified will be tested against Matrix 'A' -Table 4 above - to establish whether mitigation measures need to be carried out to improve the existing noise situation. They will also be tested against Matrix 'B' to identify whether protective measures need to be taken to preserve the quiet environment at these locations.

7. Mitigation and Protection Measures:

7.1 The Source of Road Noise.

The level of environmental noise generated by a particular road is dependent on a range of factors including the number and type of vehicles, the speed of the vehicles, the road surface and the gradient. The extent to which the noise travels from the road is affected mainly by the following parameters: distance, weather, the presence of acoustic barriers, buildings, road width, road incline, nature of the topography and whether the ground is acoustically absorbent or reflective. The most significant factor in terms of noise generation is the noise produced by the vehicle. Vehicle noise arises from three sources:

- Propulsion noise (engine, powertrain, exhaust and intake systems).
- Tyre/road contact noise.
- Aerodynamic noise.

Engine noise is the dominant source at lower speeds (under 30kph for passenger cars/under 50kph for lorries), tyre/road noise dominates above that and aerodynamic noise becomes louder as a function of the vehicle speed.

Vehicle noise limits are set in EU legislation and address propulsion noise for new vehicles. Current limits are shown in Appendix IV

The rolling noise emissions of tyres are regulated under the following EU regulations.

Regulation No 661/2009:

Concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor - -

Under the framework of Directive 2007/46/EC this regulations establishes new maximum permissible rolling noise limits for tyres available on the market across Europe. The Regulation requires tyres to comply with more stringent limits on rolling noise emissions. Compliance with these new noise limits is mandated from 1st November 2012 for new types of tyre, from 1st November 2013 for new types of vehicle and from 1st November 2016 for all new tyres and vehicles.

Tyre class	section width (mm)	values in dB(A)
C1A	≤185	70
C1B	>185 ≤215	71
C1C	>215 ≤245	71
C1D	>245 ≤ 275	72
C1E	>275	74

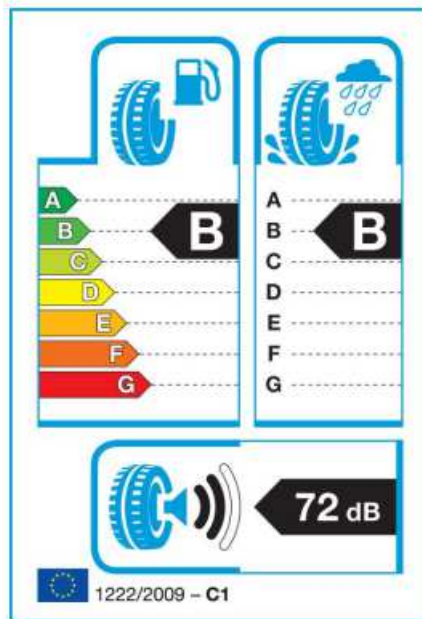
Extract from Part C 1.1 Regulation No 661/2009:

Regulation 1222/2009:

Labelling of tyres with respect to fuel efficiency and other essential parameters –

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

As from 1 November 2012 the EU Energy labels for tyres must be available from tyre sellers, tyre distributors and vehicle suppliers /distributors(when a choice is offered between tyre types) and show information on fuel consumption, wet grip and rolling noise levels, as shown below. It deals with the tyre's external noise level (expressed in decibels), not any tyre noise heard inside the vehicle.



Example of EU Energy label for tyres

7.2 Measures To Reduce Noise From Major Roads.

7.2.1 Existing Developments.

There are a limited number of approaches that can be taken to reduce noise from major roads for *existing* dwellings:

Relocating the road away from high-density settlements by the construction of a Bypass is obviously the most effective method of minimizing the numbers of dwellings likely to be affected by the road noise. This mitigation measure has been implemented in Clare with the opening of the Ennis Bypass and Western Relief road. Noise barriers were installed at a number of locations. Where areas are identified by further assessment as requiring possible mitigation, it may be possible to install noise barriers on major roads away from residential areas (where pedestrian access is not an issue).

Traffic calming measures can be employed where the major road passes through a built-up area.

Changes to the road to use low noise surfaces may be appropriate in some instances. (see CEDR Technical Report 2017-01 in relation to noise reducing pavements).

Research has indicated that road pavement surface texture defines the level of road tyre noise emission from the road pavement. The following road surface types may reduce road tyre noise:

- Smaller aggregate sizes in a thin layer pavement
- Stone Mastic Asphalt (SMA) with an altered grading curve to have a lower proportion of fine aggregates and a higher void content
- Porous asphalt which is a very open graded asphalt mix – application in two layers is said to further reduce noise levels.
- Concrete pavements with mechanical surface treatments to reduce noise emission
- Poroelastic - still under development. Rubber granulate is used to replace some of the stone aggregate. Durability is a challenge and further research is required.

Improved insulation will reduce noise levels within dwellings but this is only effective when windows are kept closed.

7.2.2 Future Developments.

The measures available for the protection of future developments from exposure to noise from major roads include acoustical planning measures in land use zoning and development layout, design and specifications, such as: locating residential developments away from major roads; using the lands around major roads feeding into towns for commercial/industrial development; incorporating noise issues into the design of housing developments (see section 2.2.7) by locating the access roads and green areas on the major road side of the development, thus increasing the separation distance between the houses and the roads; using a higher standard of insulation for new dwellings adjacent to major roads and also using higher standards of insulation for the exposed façades of new dwellings. These are acoustical planning measures although not all are within the control of the pa.

7.3. Proposed Measures For Clare Action Planning Area

7.3.1 Mitigation Measures:

Residences located within the action planning area will be tested using the decision matrix - Matrix A - to prioritise areas for which further assessment may be required.

Reducing traffic density is the most effective way to reduce road noise emissions. Clare County Council will strive to reduce traffic density on a countywide basis by:

Promoting Public Transport:

Objective 3.4 of the Clare County Development Plan 2017 to 2023 deals with Public Transport

“CDP3.4 Development Plan Objective: Small Towns

It is an objective of the Development Plan:

To ensure that the small towns throughout the County continue to act as important local service centres that maintain sustainable communities, help to ensure a good quality environment, provide public transport to the main centres, ensuring a high quality of life for those who live in the vicinity.”

Objective 8.14 of the Clare County Development Plan 2017 to 2023 deals with the Rail Network

CDP8.14 Development Plan Objective: Rail Network

It is an objective of the Development Plan:

A

To support and facilitate the improvement and expansion of rail infrastructure and services and the opening/reinstating of railway stations on the Western Railway Corridor within County Clare and in particular Crusheen;

B

To protect lands adjacent to rail stations against encroachment by inappropriate uses that could compromise the long-term development of the rail facility;

C

To identify and safeguard land required for the development of rail infrastructure including bridges, stations and goods terminals and areas necessary for the development of the rail infrastructure in the County;

D

To work with Iarnród Éireann and other interested parties to find a resolution to the issue of periodic flooding of the Limerick to Ennis railway line. All proposed developments shall be in accordance with the requirements of Objective CDP2.1.

Objective 8.15 of the Clare County Development Plan 2017 to 2023 deals with the Shannon Rail Link

CDP8.15 Development Plan Objective: Shannon Rail Link

It is an objective of the Development Plan:

To safeguard the route of the proposed Shannon Rail Link and permit development where it is demonstrated it will not inhibit the future development of the selected route as a rail link.

Objective 8.16 of the Clare County Development Plan 2017 to 2023 deals with Bus Services

CDP8.16 Development Plan Objective: Bus Services

It is an objective of Clare County Council:

A

To support the provision of more regular and efficient bus services throughout the County and to encourage private/public partnership in the provision of more widespread rural bus services;

B

To facilitate the creation of bus corridors, integrated bus transportation stations, and bus parking facilities within settlements and at tourist attractions, throughout the County;

C

To work with all relevant stakeholders to provide new bus pick up/drop off locations and bus shelters in towns and villages across the County;

D

To work with relevant stakeholders to encourage and promote a sustainable, community-based public transport scheme that will enable access to service centres for all members of the community in the County.

Promoting cycling

During 2015 Phase 1 of the West Clare Railway Greenway was constructed linking Ennis town centre to Lees Road Sports Grounds- route length approx 3.5km. During 2016 Clare County Council constructed cycling infrastructure in Ennis along three routes R458 Clareabbey to Kellys Corner, R469 Quin Road Railway bridge to Bruach na hAbhainn and a link from the R352 Tulla Rd to the R458 Gort Rd linking two housing areas ie Ennis Active Travel schemes.

Cyclist numbers have increased on the sections upgraded.

Future development of Park and Ride facilities at key location in Ennis and its environs

(subject to the availability of finances).

Improved traffic management and smoothing traffic flows.

Improvements to traffic management are proposed as follows in Ennis:

- Pedestrianisation of some town centre streets.
- Designation of cycle routes.
- Use of one-way systems.
- Modifications to junction types.

Where appropriate, new traffic calming areas will be designated and existing traffic calming measures will be optimised.

Clare County Council will consider improvement or changes to road surfaces during routine road maintenance, where necessary, by:

- Improving the quality of road surfaces by ongoing road maintenance programmes.
- Using low-noise road surfaces where appropriate. See CEDR Technical Report 2017-01

Where relevant, Clare County Council will investigate the feasibility of extending speed limit zones. For major national roads, this would be done in consultation with TII.

Clare County Council will ensure that council-owned fleet vehicles are maintained to an adequate level to minimise unnecessary noise generation. Consideration will be given to using quieter vehicles such as electric rather than diesel.

7.3.2 Protection Measures for future improvement:

Clare County Council will endeavour to utilise the planning process as necessary:

- To incorporate the aims of the present and future noise action plans into the county development plan and into relevant local area plans, protecting larger areas from road noise. Special consideration should be given to zoning objectives, speed limits and established settlements within the area.
- Developers are encouraged (or required at the discretion of the Planning Authority) to produce a sound impact assessment and implement mitigation measures as follows:
 - *For new developments proposed within the current action planning area or*
 - *For developments proposed near major roads (i.e. traffic volumes in excess of 3 million vehicles per annum or otherwise on a case by case basis).*
- Where developments are planned adjacent to major roads, to incorporate acoustical planning into the development design e.g. designing the development so that the access road is adjacent to the major road noise source. It may also involve the use of buffer zones and/or noise barriers and traffic calming measures.
- To ensure that all future developments are designed and constructed so as to minimise noise disturbance.

The above measures may be restricted under the existing provisions of the current Planning, Building and Fire Acts.

Clare County Council will consider providing for a higher standard of façade and window insulation on the most exposed façades in new local authority housing developments located beside major roads, potentially with a pre-completion sound insulation test carried out prior to habitation.

Clare County Council will consider requiring a higher standard of façade and window insulation for all new multiple residential developments located beside major roads, potentially with a pre-completion sound insulation test required prior to habitation. Clare County Council will consider requiring a higher standard of façade and window insulation for single one-off housing applications beside major roads.

The powers of the Planning Authority to impose the above measures are restricted by the provisions of the existing Planning Acts.

Protection measures for future improvement may also include extending speed limit restrictions around built-up areas.

7.3.3 Monitoring Measures:

Data presented in the noise maps shown in Appendix VI is obtained from computer modelling and is reported as a mean annual noise level, L_{den} and L_{night} . The model may overestimate the environmental noise levels resulting from major road traffic at a particular location. Where the decision matrix process identifies locations for further assessment, noise monitoring may be carried out to confirm that levels of environmental noise are unsatisfactory and that mitigation measures may be required. The possibility of other noise sources contributing to the measured noise level must be taken into account in this assessment. Where mitigation measures can be implemented, further noise monitoring will be carried out after implementation in order to quantify the improvement achieved.

Clare County Council will endeavour to ensure that sufficient traffic count data is collected on a continuous basis.

7.3.4 Consultative Measures

In areas where Clare County Council do not have a regulatory role, but where improvements in regulatory controls will effect a reduction in environmental noise from major roads, Clare County Council will consult and liaise with the relevant authorities.

These areas may include:

- i. Liaising with TII to extend speed restriction zones for national roads passing through built-up areas. Of relevance to the present and future action planning areas.
- ii. Liaising with TII to impose set back distances for developments alongside national roads.
- iii. Consult with the Department of Housing, Planning and Local Government regarding present restrictions on Planning Authorities in relation to the imposition of planning measures to address noise in the assessment of applications.
- iv. Recommend to the Planning Authority that measures proposed in this action plan be included in any revision to the Clare County Development Plan and in relevant Local Area Plans.
- v. Recommending to the Department of Transport, Tourism and Sport that noise monitoring be incorporated as part of the NCT and DOE commercial vehicle tests. Wear and tear on a vehicle will increase noise emissions and should be addressed in vehicle testing. A vehicle with a missing or defective silencer will not pass the NCT test. However a vehicle with a modified exhaust (approved sports exhaust) will pass the test unless the air emission limits are exceeded.

- vi. Recommending to the Department of Transport, Tourism and Sport that modified sports exhausts be made illegal for normal road use. This recommendation will obviously have resource implications for the Gardai in terms of enforcement.
- vii. Possibly recommending to the Department of Justice that An Garda Síochána be provided with noise testing instrumentation for roadside checks (of limited effectiveness without supporting legislation and emission limits – recommendation (vi) above would be easier to enforce and also more effective).
- viii. Liaising with the EPA to establish limit values for community noise.
- ix. Recommending to the Department of Transport, Tourism and Sport that tighter tyre rolling noise limits should be implemented at EU and national level.

8. Public Participation.

The purpose of the Public Consultation is to allow for public participation in preparation and review of the Clare Noise Action Plan. The Draft Clare Noise Action Plan 2018 was advertised and submissions invited. The draft plan was made available for inspection in public libraries in Ennis, Ennistimon, Shannon, Kilrush and Newmarket on Fergus. It was also published on the Clare County Council website www.clarecoco.ie. A newspaper notice was placed in the Clare Champion inviting submissions from the general public. Submissions/comments were made in writing and addressed to:

Administrative Officer,
Roads Section,
Clare County Council
Áras Contae an Chláir,
New Road,
Ennis,
Co. Clare.

Further details of the public consultation process and the submissions are provided in Appendix V of this final Plan.

In addition to the general public, the following stakeholders were also asked to comment on the draft noise action plan:

- Department of Transport, Tourism and Sport
- Department of Department of Communications, Climate Action and Environment
- Transport Infrastructure Ireland (formerly NRA)
- Environmental Protection Agency
- Irish Aviation Authority
- Tipperary County Council
- Limerick City and County Council
- Galway County Council
- Strategic Policy Committee on Physical Development.

During the Public Consultation period Clare County Council considered if a strategic environmental assessment of the Draft Noise Action Plan 2018 was required. It was determined that as it is not listed in the mandatory or screening categories of the regulations, an SEA was not required.

After the Public Consultation and timeframe for Submissions passed, the submissions were considered, responses formulated and a report prepared for the Councillors in advance of the July 2018 Council meeting. In Appendix V of the finalised Clare Noise Action Plan 2018 , comments on the submissions are included.

The finalised Clare Noise Action Plan 2018 will be published. A newspaper notice will be placed in the Clare Champion newspaper advertising the fact that the Clare Noise Action Plan 2018 is available.

Copies will be made available for inspection in the public libraries in Ennis, Shannon , Kilrush and Newmarket on Fergus. It will also published on the Clare County Council website www.clarecoco.ie.

9. Implementation Programme

9.1 Roles and Responsibilities

Under the Environmental Noise Regulations, 2006, TII (formerly NRA) is the noise mapping body for major national roads in Clare. Clare County Council is the noise mapping body for major non-national roads in the county. Clare County Council is the Action Planning Authority for major roads in Clare. The volumes of rail and air traffic in the county are below the thresholds for noise mapping and so the Regulations do not apply to these areas at present.

Clare County Council is responsible for preparation of this noise action plan and for meeting the stated objectives of the plan, including implementing measures to improve existing noise levels at a local level (if appropriate) and identifying and implementing measures for the protection of the future environment from road noise. Clare County Council is also responsible for identifying major non-national roads that fall under the second phase of implementation of the regulations (i.e. more than 3 million vehicles per annum) and ensuring that noise mapping is carried out for these roads. TII is the noise mapping body for major national roads under this third phase of implementation of the regulations on behalf of Clare County Council.

9.2 Targets and Objectives:

It is the aim of this action plan to manage environmental noise from major roads, to protect good satisfactory noise environments where they exist and to protect the quality of the future noise environment by acoustical planning.

The 2013 Action Plan included a Programme of works for 2013 to 2016.

The matrix assessment method to identify possible areas for further assessment was not carried out in Programme year one to two ,2013 to 2014. This was as a result of lack of budget and resources. As a consequence therefore no locations for monitoring were identified and monitoring did not take place.

The road, rail (for Limerick Ennis-Galway line) and air traffic (for Shannon Airport) data collection elements of the programme were implemented.

Cooperation with the EPA and TII in the production of the Noise Mapping and draft Noise Action Plan 2018 also took place.

9.3 Programme of Works

Year one to two (2018 to 2019):

Apply the matrix assessment method described in section 6.1 to identify from noise maps specific areas for which further assessment may be warranted (i.e. monitoring).

Year Two (2019):

Initiate monitoring in specific areas if required, to determine existing noise levels in dB(A). Identify appropriate mitigating measures for specific locations for which corrective measures are required.

Undertake consultative measures outlined in 7.3.4 above.

Year three to four (2020 to 2021):

Commence implementation of the relevant actions as outlined in section 7, where necessary.

Ensure that adequate traffic flow data is collected for all roads in the county.

Communicate with Shannon Airport Authority to receive updates on flight numbers.

Communicate with Iarnrod Eireann to receive updates on rail transport figures.

The Road Design Office will place the 2018 to 2019 work elements into its Programme.

9.4 Evaluation, Review and Corrective Action Programmes

9.4.1 Ongoing Review

Progress will be reviewed against the programme of works on an annual basis. An annual interim summary report should be prepared. This report will highlight progress in implementation of action plan measures and will also identify areas where corrective action is required or where the proposed measures must be modified for presently unforeseen reasons.

10. Financial Provisions

10.1 Budgetary Provisions.

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 prioritised. It is hoped that where mitigation measures are identified, their

implementation will also be found to be of benefit to other local authority sections eg Road's Health and Safety.

10.2 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 considerably¹⁴. Assessing 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 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 (L_{den}), per household per year. The validity range of this interim value is between 50/55 L_{den} and 70/75 L_{den} 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, Clare County Council propose to assign the monetary benefit to noise mitigation measures as recommended above - €25 per dB (L_{den}) per household per year. The number of households in the immediate area that would potentially benefit from a particular mitigation measure will also be factored into the analysis.

11. SUMMARY AND CONCLUSIONS

The Clare County Council Action Plan addresses road noise from

- the M18 motorway from Smithstown Interchange to Galway border
- the N18 from Limerick border to Smithstown Interchange
- the N19 from Smithstown Interchange to Shannon Airport entrance
- the N68 from Ennis to Kilrush
- A section of the N85 from Killow Interchange via Lehinch Road Roundabout, Ennis to the N85 junction with the R476
- R445 - from Limerick border to N18 junction (old N18)
- R463 - from Limerick border to R463/R465 junction
- R471 - Shannon Town Centre Roundabout to Ballycasey Roundabout (old N19)
- R458 - R458/N85 Clareabbey Roundabout to Ballycorey Junction through Ennis (old N18)
- R352 - R352/N85 Laureen Roundabout to R352/R458 Maid of Erin Roundabout
- R352 - R352/R871 Junction to Ballymacahill Cross
- R469 - Ennis Cathedral to Junction to Industrial Estate

Lands adjacent to these roads are considered to be located within the action planning area where noise mapping has indicated that the environmental noise levels may be 55dB L_{den} or greater.

The aim of the action plan is to manage existing road noise within the plan area and to protect the future environmental noise environment within the plan area.

While no limits exist for environmental noise in Ireland, the EPA recommends that proposed onset levels for assessment of noise mitigation measures for noise due to road traffic are as follows:

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

Noise maps were prepared for major roads in Clare based on a road noise computation model run by TII. These maps present calculated environmental noise levels from major roads in coloured noise contour bands from 55dB L_{den} and 45dB L_{night} , to greater than 75dB L_{den} and greater than 70dB L_{night} , in 5 dB bands.

The noise maps for Clare were prepared based on the roads network in place in the county in 2017.

In terms of management of *existing* road noise, the first action proposed under the current plan is to use a decision matrix to identify areas for possible further assessment. Where further assessment indicates that noise mitigation may be required, this will be carried out on a prioritized basis, applying cost benefit analysis to any proposed measures. The monetary benefit of noise mitigation will be calculated from the figure of €25 per dB (L_{den}), per household per year.

The effective management of *future* road noise within the action planning area can be addressed to some extent through the planning process (acoustical planning). It is recommended that

developers address the impact of road noise in assessment of new developments and design developments to minimize noise nuisance. For acoustical planning to be a useful tool, it can only be incorporated as a series of objectives into the Clare County and Local Area Development Plans. Changes to supporting legislation will be required in order to effectively implement acoustical planning into the planning process.

Appendix I

Glossary of acoustic and technical terms

Glossary

Acoustical Planning: Controlling future noise by planned measures such as land-use planning, systems engineering for traffic, traffic planning, abatement by sound-insulation measures and control of noise sources.

Agglomeration: a dense urbanized area having a population of greater than 100,000 persons.

Decibel (dB): A unit of measurement of sound. When measuring environmental noise, an “A” weighting network is used (called dB(A)) which filters the frequency of the sound to mimic human hearing, which is most sensitive to frequencies between 500Hz and 5,000Hz. The decibel scale is logarithmic. If two noise sources emit the same sound level (eg 80dB(A)), the combined sound level from the two sources is 83dB(A) and not 160dB(A).

The human perception of “loudness” is that a 10dB increase in sound level is perceived as being twice as loud. A 3dB increase, which is a doubling of the sound level, is perceived as a barely perceptible change in loudness.

A decibel level of zero represents absolute silence. A level of 140dB(A) would cause ear pain.

The table below gives examples of the relationship between the subjective valuation of noise and the actual objective levels (taken from the END Briefing note of the 07/02/08):

Noise Level dB (A)	Description
120	Threshold of Pain
95	Pneumatic drill (at 7m distance)
83	Heavy diesel lorry (40km/h at 7m distance)
81	Modern twin-engine jet (at take-off at 152m distance)
70	Passenger car (60km/h at 7m distance)
60	Office environment
50	Ordinary conversation
40	Library
35	Quiet bedroom
0	Threshold of hearing

Daytime: Between the hours of 7am and 7pm

DB(Lin)_{max peak}: Instantaneous Maximum Peak sound pressure measured in decibels on a sound level meter, without the use of a frequency weighting system. Used to measure air overpressure levels from blasting.

Evening time: Between the hours of 7pm and 11pm

Environmental Noise: Shall mean 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 such as integrated pollution prevention and control licensed industries.

Hertz: Unit of frequency of sound.

IPPC Licence: Integrated Pollution Prevention and Control Licence (obtained from EPA).

L_{den}: (day-evening-night noise rating indicator) shall mean the noise indicator for overall annoyance. This comprises of adding the average value for the 12 hour day time period with the average value of the 4 hour evening period plus a 5 decibel weighting or penalty, and the average value for the 8 hour night time period with a 10 decibel weighting or penalty.

L_{day}: (day-noise indicator) shall mean the noise indicator for annoyance during the day period. This is the average value in decibels for the daytime period

L_{evening}: (evening-noise indicator) shall mean the noise indicator for annoyance during the evening period. This is the average value in decibels for the evening time period.

L_{night}: (night-time noise indicator) shall mean the noise indicator for sleep disturbance. This is the average value in decibels for the nighttime period

Major road: a national or regional road with more than 3 million vehicles per annum.

Major railway: A railway line, which has more than 30,000 train passages per year.

Major Airport: 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.

Night time: Between the hours of 11pm and 7am

Noise annoyance: Noise annoyance is defined by the World Health Organisation (WHO) as 'a feeling of displeasure evoked by noise'¹⁶.

Peak Particle Velocity (ppv): Peak particle velocity is a measure of vibration magnitude, which is the maximum rate of change of ground displacement with time, usually measured in mm/sec.

Appendix II

Summary of method used to generate statistics of population exposed to noise from roads

The following is extracted from “Guidance Note for Strategic Noise Mapping For the Environmental Noise Regulations 2006 Version 2 August 2011 Revised Section 10: Methodology for Exposure Assessment - Post Processing and Analysis October 2017 By the ENVIRONMENTAL PROTECTION AGENCY”

10 Stage7 – Post Processing and Analysis

After the completion of the noise calculations the noise level results are available as derived datasets from the noise modelling process.

The noise results generated can now be mapped, presented graphically, and used as the basis for supplementary analysis in order to derive the required information for reporting to the Commission.

10.1 Reporting Requirements

The EPA is to report to the European Environment Agency using the Electronic Noise Data Reporting Mechanism (ENDRM) as set out in EEA Technical Report No 9/2012 plus the various Annex documents covering the individual reporting data flows. The Noise Mapping Bodies (NMBs) are to report results to the EPA using the same ENDRM methodology based upon the templates available from the EEA. The EPA will provide NMBs with reporting templates and any specific guidance as appropriate.

10.2 Requirements of the Directive

Annex VI of the END requires that “the estimated number of people living in dwellings” exposed to various noise levels “4 m above the ground on the most exposed façade” is provided for various scenarios.

For this reason, it is necessary to more clearly define the terms “people”, “dwellings”, and “most exposed façade”. For the purposes of the statistics required by Annex VI, persons (or people) can be defined as “human” beings, thus being consistent with the scope of the END defined in Article 2, paragraph 1. They are members of “the public” as defined in Article 3 (v) as “one or more natural or legal persons and, in accordance with national legislation or practice, their associations, organisations or groups”. The term “population” is not referred to in the END, and is only a convenient means of referring to the exposure assessment, which as noted above is for “the estimated number of people living in dwellings”. It should be noted that the estimation of the number of people living in dwellings does not directly assess the exposure of people, as individuals move around; rather the exposure assessment is carried out upon the building/dwelling in which people normally reside. In the assessment there is no attempt to reflect the temporal dimension of the movement of population in this exposure assessment.

The CSO defines dwellings as a self-contained unit of living accommodation that is occupied or, if vacant, is intended for occupation by one or more households. A dwelling should have a separate access to the street (direct or via a garden or grounds) or to a common space within a building (staircase, passage gallery, etc.).

Examples include: a family home, a family home on a farm, a separate flat, apartment or bed-sit, a caravan, a caretaker’s accommodation located in an office building, living accommodation over a shop.

A household is an occupied dwelling and forms the basis of the population in the CSO published Census data T5_2_TP field as part of the Small Area Population Statistics. Almost all of these persons in this field are usually resident in the household.

The CSO also publish SAPS data for Communal Establishments, which are defined as establishments providing managed residential accommodation. Managed means full-time or part-time supervision of the accommodation and generally consist of

Hotels, Educational establishments, Prisons, Boarding Houses, Religious communities, Defence establishments, Guest Houses, Children's homes, Civilian ships, boats and barges, Bed and breakfast, Nursing home, Garda station, Hostel, Hospital/Nurses' home and Holiday campsite. As can be seen some of the people enumerated in Communal Establishments consist of persons who are non-resident and those who are normally residing within the establishment, however they do not fit the CSO definition of dwellings, and are therefore outside the scope of the END assessment. Some of these Communal Establishments may be considered as noise sensitive, and their exposure could be determined separately, or investigated specifically during the development of the Noise Action Plans.

Importantly, the use of "dwellings" within the END indicates that vacant or unoccupied dwellings should be included within the assessment of exposure of dwellings, but not within the assessment of exposure of people if the dwellings are known to be vacant, as this is contra to the phrasing used, e.g. "how many persons in the above categories live in dwellings that have" and "The estimated total number of people (in hundreds) living in dwellings". For this reason, the revised approach set out below will provide two approaches to identifying dwellings, one including vacant dwellings, to be used in the dwelling exposure assessment, and the other which excludes them, for use in the assessment of numbers of people living in dwellings.

The term "building" as used by CSO is not referred to directly in the context of the exposure assessments required by Annex VI. A building may contain zero, one or more individual dwellings. Residential buildings can therefore be considered to be those buildings containing one or more individual "Private dwellings". Noise-sensitive buildings may be considered those buildings which contain "Non-private dwellings", or which have uses which the competent authority deems to be noise sensitive, such as libraries etc for the purpose of the Noise Action Plan.

The façades of a dwelling shall consist of all externally facing walls. Annex I, 1 defines the L_{den} using the stated formula, and in which: "the incident sound is considered, which means that no account is taken of the sound that is reflected at the façade of the dwelling under consideration". This indicates that the subsequent references to façade indicate the façade of the dwelling under consideration. Which would be consistent with Annex III regarding dose-response relationships: "dwellings with a quiet façade as defined in Annex VI".

Regarding the most exposed façade Annex I, 1 states: "the most exposed façade; for this purpose, the most exposed façade will be the external wall facing onto and nearest to the specific noise source; for other purposes other choices may be made".

Subsequent practical experience has demonstrated that selection of the most exposed façade based upon distance may lead to contradictory situations. For this reason, a revised definition is proposed: "the most exposed façade will be the external wall of the dwelling exposed to the highest value of L_{den}/L_{night} from the specific noise source under consideration (e.g. road traffic)." The proposed definition is also more consistent with the existing definition of quiet façade.

Regarding quiet façade, Annex VI, 1.5 states: "a quiet façade, meaning the façade of a dwelling at which the value of L_{den} four metres above the ground and two metres in front of the façade, for the noise emitted from a specific source, is more than 20 dB lower than at the façade having the highest value of L_{den} ." This makes determination of the presence of a quiet façade more complex as it necessary to determine the noise exposure at a different distance from the façade of the dwelling than for the most exposed façade. As the reporting of quiet facades is optional, it is not currently proposed to determine the presence of quiet facades.

10.3 Preparing the Input Datasets

Given the above definitions the input datasets required to undertake the required assessments may be identified.

10.3.1 SAPS Census Data

Central Statistics Office (CSO) publish statistical information on population based upon Census returns. The most recent Census was held on 24 April 2016, and the majority of the information is now available. The information available on population is issued according to various political boundaries, namely Province or County, Province County or City, Regional Authority, Constituency, Electoral Division and Small Areas. Data is not made available at Census Output Area level; rather these are merged up to the Small Area Population Statistics (SAPS) level which provides for the highest level of resolution available to the location of the population. There are 18,641 SAPS covering Ireland in the 2016 Census output data.

The complete SAPS dataset is contained in a CSV file, "SAPS2016_SA2017.csv", with each of the entries explained within the glossary file, "SAPS_2016_Glossary.xlsx". The three most relevant totals within the dataset for the END assessment are:

- T1_1AGETT – Total Population
- T5_2_TP – Total of Persons in Private Households
- T7_1_NP – Total of Persons in Communal Establishments

It is suggested that a revised version of the CSV file is created containing the six relevant fields: GUID, GEOGID, GEOGDESC, T1_1AGETT, T5_2_TP and T7_1_NP

In order to provide an accurate spatial location for the population within each SAPS area it is necessary to have an up to date map of SAPS boundaries which matches the SAPS codes within the population exposure statistics report. The Small Areas Ungeneralised OSi National Statistical Boundaries dataset is available in various formats.

The SAPS boundary data is delivered in WGS 1984 projection, and may need to be projected to either Irish Transverse Mercator (ITM) or Irish National Grid (ING) depending on how the noise mapping datasets have been set up within the project. The SAPS boundary Shapefile may then be joined to the CSV file based on the GUID which assigns the three population totals to each of the SAPS boundary polygons.

As this is a national coverage dataset, it is recommended that for specific project areas it is filtered on NUTS3, COUNTY, EDNAME or SMALL_AREA to produce smaller coverage datasets which may be used going forward. Note: It is recommended NOT to run an intersect based on boundary polygons as this can bisect the SAPS polygons and produce erroneous population statistics. With the number of people assigned to each SAPS area, it is now necessary to establish which buildings contain dwellings, and the total number of people living within those dwellings.

10.3.2 GeoDirectory

The GeoDirectory data products are developed by OSi and An Post to provide a single point location object for each building in Ireland. The complete dataset is available with the "GeoAddress Locator" product, and each point location has a number of attributes which may be useful in identifying both vacant and occupied dwellings.

GeoDirectory is updated quarterly, for the purpose of the R3 strategic noise mapping it is recommended to use the Q1 2016 version following advice from CSO, who used

this version when developing the SAPS data for Census 2016.

As GeoDirectory provides a location point for each building, it is necessary to undertake a filter procedure in order to identify the two location datasets required for the assessment, namely:

- Point locations for buildings containing dwellings, and
- Point locations for buildings containing occupied dwellings.

The highest level of resolution within GeoDirectory is within the ADDRESS_POINTS table, which has a many-to-one link to the BUILDINGS table i.e. there can be many address points within one building, and one building may contain one or many address delivery points.

The number of linked address points is provided by the RESIDENTIAL_DELIVERY_POINTS and COMMERCIAL_DELIVERY_POINTS attributes. The RESIDENTIAL_DELIVERY_POINTS have a blank entry in the ORGANISATION attribute within the ADDRESS_POINTS table, whereas the COMMERCIAL_DELIVERY_POINTS should have an entry in the ORGANISATION attribute within the ADDRESS_POINTS table.

The BUILDING_USE attribute has three possible entries: R for Residential, C for Commercial and B for Both. Commercial should have zero RESIDENTIAL_DELIVERY_POINTS, whilst Residential should have zero COMMERCIAL_DELIVERY_POINTS.

The ADDRESS_POINTS table also has attributes for VACANT, INVALID, UNOCCUPIED and UNDER_CONSTRUCTION for each of the entries, whether they are commercial, residential or both.

In order to produce a location dataset of "RESIDENTIAL_ADDRESS_POINT", the following filters should be applied to the GeoDirectory ADDRESS_POINTS table:

- BUILDING_USE – filter out all C (commercial);
- DERELICT – filter out all Y (yes);
- INVALID – filter out all Y (yes);
- UNDER_CONSTRUCTION – filter out all Y (yes) entries; and
- RESIDENTIAL_DELIVERY_POINTS – filter out all 0 (zero) entries, as they do not have any residential delivery points.

The resultant dataset contains the location points for all residential address point, whilst the RESIDENTIAL_DELIVERY_POINTS attribute provides the total number of residential dwellings within each building. In order to create a location dataset for occupied buildings, the following steps should be undertaken. Add Field in the attribute table for VACANT_ADD_PNT, use the Field Calculator to assign VACANT_ADD_PNT = 1 if VACANT = "Y".

To produce a building level dataset from the address point data, the GeoDirectory data should be dissolved to result in one entry per BUILDING_ID, keeping the following fields:

BUILDING_ID - first
ADDR_LINE_1 - first
ADDR_LINE_2 - first
ADDR_LINE_3 - first
ADDR_LINE_4 - first
ADDR_LINE_5 - first
ADDR_LINE_6 - first
RESIDENTIAL_DELIVERY_POINTS - mean

COMMERCIAL_DELIVERY_POINTS - mean
BUILDING_USE - first
SMALL_AREA_ID - first
EAST - first
NORTH - first
VACANT_ADD_PNT – sum

Open the attribute table of the new building level dataset and Add Field OCCUPIED_ADD_PNT and use Field Calculator to populate it with MEAN_RESIDENTIAL_ADDRESS_POINTS – SUM_VACANT_ADD_PNT.

Note:

In some cases, there are more entries for a building point in the address point dataset than there are residential address points, typically for blocks of flats where the building name has an entry alongside an entry per flat. As a result, this can create negative values for OCCUPIED_ADD_PNT therefore it is recommended to add an if statement to ensure any negative values of OCCUPIED_ADD_PNT are set to zero.

The building level Geodirectory data now contains the two values required for the exposure assessment per building address point:

- Number of dwelling = MEAN_RESIDENTIAL_ADDRESS_POINTS
- Number of occupied dwellings = OCCUPIED_ADD_PNT

As a final step, if necessary, the GeoDirectory point data should be clipped to the dissolved boundaries of the SAPS area covering the project extent.

10.3.3 OSi PRIME2 Buildings

Ordnance Survey Ireland PRIME2 is the newly developed spatial data storage model first delivered in 2014. This authoritative spatial reference framework ensures consistent and unique referencing of topological state information, both in terms of location and in terms ID tag referencing. The database is constantly updated and each object time stamped, which enables datasets to delivered representative a certain point in time. Following discussions with CSO it is recommended to use PRIME2 datasets from July 2016.

Buildings are represented in two themes, as a point at the centre of the building footprint, and as a polygon objects describing the outline of the building.

Within the areas of noise mapping it is necessary to have building polygon objects in order to successfully undertake the noise calculations. Detached, semi-detached and terrace properties should have each unit described as a separate polygon i.e. a semi-detached building is two adjoining polygon objects, a row of terrace properties is a series of adjoining polygon objects.

Within the PRIME2 BUILDING_POLY theme the following attributes may be useful for the noise mapping process:

- FORM_ID – building type category, e.g. apartment building, hospital etc
- FUNC_ID – building use category, e.g. rectory, convent, residence etc
- GEO_ID – GeoDirectory building number
- GUID – unique ID of the building polygon
- WAY_SEG_VALUE – ID of the adjacent road in the WAY theme
- SHAPE_Area – polygon area

10.4 Developing the Population Distribution Datasets

Ideally the GEO_ID could be used to join the GeoDirectory building data to the building polygons, however it does not form a robust method at present for the following reasons:

- GeoDirectory points for which there is no PRIME2 building polygon, possibly due to recent construction; and
- Multiple GeoDirectory points within a single PRIME2 building polygon.

In order to address these two issues, and prepare the final population distribution datasets required for the exposure assessment the following workflow is proposed.

10.4.1 Stage 1: Clip the GeoDirectory points inside building polygons

The noise mapping software will use the PRIME2 building polygons as part of the noise calculation model. The building polygons will have a height assigned which will be used as part of the propagation model, and the basis for the façade receiver points. Therefore, the buildings within the PRIME2 theme will be used in the calculation model, and the façade receivers used for the basis of the dwellings and people in dwellings exposure assessment will be placed around these building objects. For this reason, only GeoDirectory points inside building polygons will be considered for the exposure assessment, and the SAPS population data will be assigned to these buildings.

Clip dissolved GeoDirectory points with the PRIME2 BUILDING_Poly theme

Dublin County = 398,860 clipped dissolved GeoDirectory points
sum RESIDENTIAL_DELIVERY_POINTS = 532,974
sum OCCUPIED_ADD_PNT = 529,265

Cork Agglomeration = 69,001 clipped dissolved GeoDirectory points
sum RESIDENTIAL_DELIVERY_POINTS = 81,913
sum OCCUPIED_ADD_PNT = 80,967

10.4.2 Stage 2: Spatial join GeoDirectory Points to SAPS Area Data

Next the number of occupied dwellings is to be joined to the SAPS area data. Spatial Join SAPS areas to the clipped dissolved GeoDirectory points from Stage 1.

Join Operation: JOIN_ONE_TO_ONE
Keep All Target Features – Ticked

Merge Rules:
BUILDING_ID = Count
RESIDENTIAL_DELIVERY_POINTS = Sum
COMMERCIAL_DELIVERY_POINTS = Sum
VACANT_ADD_PNT = Sum
OCCUPIED_ADD_PNT = Sum

Match Option: CONTAINS

Dublin County = 4,882 SAPS areas
sum RESIDENTIAL_DELIVERY_POINTS = 532,974
sum OCCUPIED_ADD_PNT = 529,265
Cork Agglomeration = 778 SAPS areas
sum RESIDENTIAL_DELIVERY_POINTS = 81,913

sum OCCUPIED_ADD_PNT = 80,967

10.4.3 Stage 3: Assign “Persons in Private Households per Occupied Address Point” to each SAPS Area

Using the SAPS Area output from Stage 2:

Open Attribute Table- Add Field...

PPH_OcAP

Select the new PPH_OcAP attribute and Field Calculator...

$PPH_OcAP = [T5_2_TP] / [OCCUPIED_ADD_PNT]$

(Persons in Private Households per Occupied Address Point)

10.4.4 Stage 4: Assign “Population per Residential Delivery Point” to each GeoDirectory delivery point

Using the SAPS Area output from Stage 3:

Spatial Join SAPS area from the end of Stage 3, to the clipped dissolved GeoDirectory points.

Join Operation: JOIN_ONE_TO_ONE

Keep All Target Features – Ticked

Merge Rules:

PPH_OcAP = First

Match Option: WITHIN

10.4.5 Stage 5: Assign Total Residents Per Building to Residential Delivery Points

Using the GeoDirectory data output from Stage 4:

Open Attribute Table-Add Field...

RESIDENTS

Select the new RESIDENTS attribute and Field Calculator...

$RESIDENTS = [PPH_OcAP] * [OCCUPIED_ADD_PNT]$

Dublin County = 398,860 GeoDirectory points

sum RESIDENTS = 1,308,629

sum RESIDENTIAL_DELIVERY_POINTS = 532,974

sum OCCUPIED_ADD_PNT = 529,265

Cork Agglomeration = 69,001 GeoDirectory points

sum RESIDENTS = 190,938

sum RESIDENTIAL_DELIVERY_POINTS = 81,913

sum OCCUPIED_ADD_PNT = 80,967

10.4.6 Stage 6: Assign Building Use and Residents and Dwellings per Building to Building Polygons

Using the GeoDirectory data output from Stage 5:

Spatial Join PRIME2 BUILDING_POLY to the GeoDirectory points from the end of Stage 5.

Join Operation: JOIN_ONE_TO_ONE

Keep All Target Features – Ticked

Merge Rules:

RESIDENTIAL_DELIVERY_POINTS = Sum
BUILDING_USE = First
VACANT_ADD_PNT = Sum
OCCUPIED_ADDR_PNT = Sum
PPH_OaAP = Mean
RESIDENTS = Sum

Match Option: CONTAINS

This joins the Geodirectory and population data to each building polygon, and sums the attributes where there are multiple GeoDirectory points within a building polygon.

IMPORT TO PREDICTOR

These BUILDING_POLYGONS may now be imported to Predictor as Buildings and Grouped according to the Building_Use classes:

C = Commercial

B = Both Residential and Commercial

R = Residential

This will help Predictor to setup façade receiver points around Residential and Mixed-Use buildings.

Note:

When preparing building polygons for the noise calculation model, it is a typical approach to remove small buildings from the model, often <25, if this is undertaken it is important that only buildings with no residents or dwellings are removed.

10.4.7 Stage 7: Create Address Points from building Polygons

Using the building polygon data output from Stage 6:

Feature to Point

Inside – ticked

This process creates the address point dataset with each point being inside the corresponding building polygon, having the same ID as the building polygon, and having the number of dwellings and persons in dwelling as attributes.

IMPORT TO PREDICTOR

These address points may now be imported to Predictor as Address Points, with RESIDENTS and Dwellings (RESIDENTIAL_DELIVERY_POINTS) per building.

10.5 Noise Grid Processing

The grids of noise assessment results delivered from the noise mapping software may have a number of aspects which require attention prior to the processing of the various stages of statistical analysis.

Noise results grids may contain:

- Empty grid points or default data values for grid points located inside buildings where an assessment of noise level is not considered appropriate;
- Default data values for grid points located outside the boundary of the area to be mapped; and
- Result values to more than two decimal places.

To prepare the grids of noise results, it is recommended that the results files are verified, and relevant pre-processing undertaken:

- Interpolation of grid values to assign indicated noise levels to points with blank or default values to produce a “seamless” results grid;
- Rounding of the results to two decimal places; and
- Masking of the seamless results grids to the extent of the area to be mapped.

These processed noise results grid files may then be used for the following:

- Production of 5dB noise contour bands for graphical mapping of results; and
- Production of reclassified grids into a set of 5dB categories.

The reclassified grids are produced by assigning each point to a classification based upon the 5dB band in which the noise level resides.

The 5dB bands are:

•Lden <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >=75

•Lnight <50, 50 – 54, 55 – 59, 60 – 64, 65 – 69, >=70

Note:

all class boundaries are .00, i.e. 55-59 is actually 55.00 to 59.99. This is in line with the approach of a number of the commercial noise mapping software packages. This may require the use of a database program such as MS Access, MS SQL or MySQL where class boundaries can be programmed. The default behaviour in MS Excel should not be used for this analysis as it rounds at .49 and .50, however the ROUNDDOWN function may be used to apply the class boundaries.

10.6 Area Analysis

The EC recommended reporting mechanism, ENDRM 2012 DF8, requires information on the total area, inside and outside agglomerations, (in sq km) exposed to Lden higher than 55, 65 and 75dB for major roads, major railways and major airports. The reclassified grid files may be used to calculate these areas as each 10m interval grid point is at the centre of an area 10m by 10m, therefore each grid point represents 100 sq m. This approach avoids the secondary processing required to produce equal noise level contours based upon an interpolation between the grid points, and therefore avoid introducing any further uncertainty into the results.

10.7 Façade Noise Levels

For the assessment of exposed dwellings and people living in dwellings it is necessary to have façade noise levels around the perimeter of the buildings which contain dwellings.

Façade noise level calculations

The PRIME2 building polygon dataset developed above may have been used within the Predictor noise calculation software, and façade receiver points automatically generated around building_use R and B polygons.

Where noise level calculations have been carried out for façade receptors around buildings, they should be used as the source dataset for noise exposure for each building.

If the façade receptor points are at a distance of 0.1m from the building façade (as recommended by WG-AEN GPG v2) then the building polygon may be buffered by 0.2m and a spatial search undertaken inside the resulting polygon to find the highest and lowest noise level figures from the calculation point. These highest and lowest noise levels may then be assigned to the building polygon as attributes.

Grid noise level calculations

Where only 10m grids of noise levels have been calculated, or where buildings were absent from the noise assessment model but are available within the OSi PRIME2 data, it will be necessary to generate building façade receptor locations, and assign noise levels to these points based upon interpolation from the grid of noise levels.

- a) Façades are split up every 5 m from start position on with a receiver position placed at half distance
- b) The remaining section gets its receiver point in its middle.

At each façade receptor point the noise level should be determined by interpolation from the 10m grid noise levels nearby. The highest and lowest noise levels for each building polygon may then be identified and assigned to the building polygon as attributes.

10.8 Assessment of Noise Level Exposure

The total number of features within dataset "RESIDENTIAL_DELIVERY_POINTS" per noise level band then be calculated using the highest noise level per building to determine the total number of dwellings within each noise level band.

The RESIDENTS = 0 (zero) buildings can then be filtered out of the dataset, and the total number of persons per building summed per noise level band, using the highest noise level per building, to determine the total number of people exposed within each noise level band.

The 5dB bands to be used are:

- Lden <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >=75
- Lnight <50, 50 – 54, 55 – 59, 60 – 64, 65 – 69, >=70

Note : all class boundaries are .00, i.e. 55-59 is actually 55.00 to 59.99. This is in line with the approach of a number of the commercial noise mapping software packages. This may require the use of a database program such as MS Access, MS SQL or MySQL where class boundaries can be programmed. The default behaviour in MS Excel should not be used for this analysis as it rounds at .49 and .50, however the ROUND DOWN function may be used to apply the class boundaries.

END

Appendix III

Bibliography

Bibliography

1. Directive 2002/49/EC relating to the assessment and management of environmental noise.
2. SI 140 of 2006, Environmental Noise Regulations 2006.
3. EPA Guidance Note for Noise Action Planning, EPA Version 2 August 2011, Revised Section 10 October 2017, Updated sections February 2018, updated in April 2018 (draft)
4. CSO Census data 1996, 2002, 2006, 2011, 2016 www.cso.ie
5. www.shannonairport.ie
6. Information supplied by Shannon Airport Air Traffic Control Section.
7. TII Expansion Factors for Short Period Traffic Counts
8. Draft Noise Action Plan for Dublin Agglomeration, Brian MacManus.tyr
9. Quarries and Ancillary Activities: Guidelines for Planning Authorities, DOEHLG April 2004.
10. Clare County Development Plan 2017-2023.
11. WHO Estimating the Burden of disease from Environmental Noise 2012
12. RIVM Health Implication of Road, Railway and Aircraft Noise in the EU 2014
13. CEDR Technical Report 2017-01

Appendix IV

EU Noise Emission Limits for New Road Vehicles

Regulation (EU) 540/2014

ANNEX III

LIMIT VALUES

The sound level measured in accordance with the provisions of Annex II, mathematically rounded to the nearest integer value, shall not exceed the following limits:

Vehicle category	Description of vehicle category	Limit values expressed in dB(A) [decibels (A)]		
		Phase 1 applicable for new vehicle types from 1 July 2016	Phase 2 applicable for new vehicle type from 1 July 2020 and for first registration from 1 July 2022	Phase 3 applicable for new vehicle type from 1 July 2024 and for first registration from 1 July 2026
M	Vehicles used for the carriage of passengers			
M ₁	power to mass ratio ≤ 120 kW/1 000 kg	72 ⁽¹⁾	70 ⁽¹⁾	68 ⁽¹⁾
M ₁	120 kW/1 000 kg < power to mass ratio ≤ 160 kW/1 000 kg	73	71	69
M ₁	160 kW/1 000 kg < power to mass ratio	75	73	71
M ₁	power to mass ratio > 200 kW/1 000 kg number of seats ≤ 4 R point of driver seat ≤ 450 mm from the ground	75	74	72
M ₂	mass ≤ 2 500 kg	72	70	69
M ₂	2 500 kg < mass ≤ 3 500 kg	74	72	71
M ₂	3 500 kg < mass ≤ 5 000 kg; rated engine power ≤ 135 kW	75	73	72
M ₂	3 500 kg < mass ≤ 5 000 kg; rated engine power > 135 kW	75	74	72
M ₃	rated engine power ≤ 150 kW	76	74	73 ⁽²⁾
M ₃	150 kW < rated engine power ≤ 250 kW	78	77	76 ⁽²⁾
M ₃	rated engine power > 250 kW	80	78	77 ⁽²⁾
N	Vehicles used for the carriage of goods			
N ₁	mass ≤ 2 500 kg	72	71	69
N ₁	2 500 kg < mass ≤ 3 500 kg	74	73	71
N ₂	rated engine power ≤ 135 kW	77	75 ⁽²⁾	74 ⁽²⁾
N ₂	rated engine power > 135 kW	78	76 ⁽²⁾	75 ⁽²⁾
N ₃	rated engine power ≤ 150 kW	79	77	76 ⁽²⁾
N ₃	150 kW < rated engine power ≤ 250 kW	81	79	77 ⁽²⁾
N ₃	rated engine power > 250 kW	82	81	79 ⁽²⁾

Appendix V

Details of Public Consultation

Details of Public Consultation

County Councillors were informed in advance about publication of the Draft Plan and were also informed where the draft plan and maps were available for inspection.

The Public Consultation process commenced with the publication of a notice in the Clare Champion newspaper on 11th May 2018.

A presentation on the Draft Noise Action Plan 2018 was made to Strategic Policy Committee on Physical Development on 28th May 2018. No changes to the Draft Noise Action Plan 2018 Plan were requested.

Copies of the Draft Noise Action Plan 2018 were issued to the following bodies:

- Department of Transport, Tourism and Sport
- Department of Department of Communications, Climate Action and Environment
- Transport Infrastructure Ireland (formerly NRA)
- Environmental Protection Agency
- Irish Aviation Authority
- Tipperary County Council
- Limerick City and County Council
- Galway County Council
- Strategic Policy Committee on Physical Development.

The Draft Noise Action Plan was available for inspection at the locations outlined on the advertisement ie. Offices and Libraries of Clare County Council in the Action Plan areas. It was also placed on the Clare County Council website. Closing date for receipt of submissions was 22nd June 2018.

Submissions received

Three submissions were received and are summarized below along with a summary response.

Submission 1: The TII raised the following points:

- Requested that all reference to "the TII" should read "TII".
- They noted that in 2004 the NRA had published "Guidelines for the treatment of Noise and Vibration in National Road Schemes".

Summary Response to Submission 1: These references can be included in the final Noise Action Plan 2018.

Submission 2: A Submission by two residents of Knockanean townland raised the following points:

- They live in Knockanean directly beside the M18 near the bridge. *They do not give and exact location. It is likely to refer to the bridge over the M18 on the Knockanean road.*
- They say that traffic has increased on the M18
- They indicate that noise from M18 motorway is intrusive during the day and at night they provide a link to the EPA noise map for their area and say that they are half in the 65-69 dB purple area and half in red 60-64dB. *Note these are Lden values.*
- Request for noise protection in the form of an Earth bund or an acoustic barrier from the overpass and all along their property boundary and along the adjacent property and request that it be 2 to 3m in height
- They request that the speed limit be reduced along this section of motorway as a measure to reduce noise

Summary Response to Submission 2: It should be noted that the noise maps which accompany the 2018 Draft Noise Action Plan are the Clare Co Co Noise maps 2018 which were made available on the Clare County Council website and the locations listed in the newspaper advert.

In order to focus resources on areas in most need of improvement a decision support matrix will be used by Clare Co Co. This can be undertaken for properties in the Knockanean townland adjacent to the M18 and if necessary the area will be included in a short list for further assessment. Noise monitoring may then take place to determine on site noise values and following on from that an assessment will be made of any further requirements. It will not be possible to reduce the speed limit on the M18.

Submission 3: A submission made by residents of Knockanean and signatures were submitted supporting the submission. They raised the following points:

- They request that a matrix assessment be carried out for the Knockanean area near the M18 motorway.
- They request that the Knockanean area is assessed for noise and that noise reduction measures in the form of acoustic barriers are installed.

Summary Response to Submission 3:

It is likely that this relates to the same area as Submission 2 and therefore the same response applies.

In order to focus resources on areas in most need of improvement a decision support matrix will be used by Clare Co Co. This can be undertaken for properties in the Knockanean townland adjacent to the M18 and if necessary the area will be included in a short list for further assessment. Noise monitoring may then take place to determine on site noise values and following on from that an assessment will be made of any further requirements.

Clare County Council would like to thank those who made submissions.

The Draft Noise Action Plan 2018 was on the agenda of the July 2018 meeting of Clare County Council and document was circulated to County Councillors outlining the submissions and above responses.

No alteration or additions were requested by the Council Members and the Draft Noise Action Plan 2018 was approved by the Council.

The Clare County Council Noise Action Plan 2018 has now been approved and is in place.

July 2018.

COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL

ENVIRONMENTAL NOISE REGULATIONS, 2006
(S.I. No. 140 of 2006)

**NOTICE OF PUBLIC CONSULTATION ON DRAFT NOISE
ACTION PLAN 2018 IN RESPECT OF COUNTY CLARE.**

Clare County Council invites submissions from the public on the draft Noise Action Plan 2018, prepared under SI No. 140 of 2006, to address noise from major transport sources.

This is a five-year strategic plan to address noise from major roads in Clare. The plan excludes noise from domestic activities, noise created by neighbours, noise at workplaces or noise inside a means of transport or due to military activities in military areas.

The main purpose of the plan is to inform and consult the public about exposure to noise from major roads and the corrective measures that may be considered to address these issues.

The draft plan and associated maps will be available for inspection at the following locations for a period not less than four weeks beginning on the date of publication of this notice:

- Roads Section, Clare County Council, Áras Contae an Chláir, New Road, Ennis (during normal working days from 9.00 a.m. to 5.00 p.m).
- Kilrush Municipal District Office, Town Hall, Kilrush.
- Shannon Municipal District Office, Civic Offices, Shannon.
- Ennistimon Municipal District Office, Ennistimon
- Killaloe Municipal District Office, Mountshannon Rd, Scarriff
- De Valera Library, Harmony Row, Ennis.
- Kilrush Public Library, Kilrush
- Newmarket-on-Fergus Public Library, Newmarket-on-Fergus.
- Sean Lemass Library, Shannon Town.
- Ennistimon Public Library, Ennistimon

The plan may also be accessed on the Clare County Council website www.clarecoco.ie

Submissions or observations on the draft plan are invited from the general public. These submissions may be made in writing to :

Administrative Officer,
Roads Section,
Clare County Council,
Áras Contae an Chláir,
New Road,
Ennis,
Co. Clare.

or by email to rdo@clarecoco.ie up to and including 22nd June 2018

Appendix VI

Strategic Noise Maps

See book of A3 drawings