Donegal County Council

Noise Action Plan 2018 - 2023

February 2018

Donegal County Council

Donegal County Council Noise Action Plan

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

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EXECUTIVE SUMMARY

This Noise Action Plan has been prepared by Donegal County Council to address environmental noise from sections of major roads in the county with more than three million vehicles per annum.

The plan was prepared in accordance with the requirements of EC 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 a European Commission common approach to avoid, prevent or reduce on a prioritised 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.

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

- major railways with more than 30,000 trains per annum (not applicable to Donegal);
- major airports with more than 50,000 flights per annum (not applicable to Donegal);
- major roads with more than 3 million vehicles per annum; and
- agglomerations of greater than 100,000 inhabitants (not applicable to Donegal).

Transport Infrastructure Ireland (TII), as the noise mapping body for major national roads, has prepared noise maps (Round 3) for sections of the N56, N15, N14 and N13 that have been confirmed by verified vehicle count data to be a major road for the purposes of the regulations. They have also included in the maps prepared sections of the R229, R238, R245 and the R250 which are part of the Non-National Regional Road Network and have been confirmed by verified vehicle count data to be a major road for the purposes of the regulations. Transport Infrastructure Ireland (TII) following a methodology in EPA guidance based on GeoDirectory data, estimate the approximate number of individuals located within the action planning areas in County Donegal where the noise levels exceed the Lden value of 55dB and Lnight value of 50dB to be 10,871 and 6,167 respectively.

The purpose of this Action Plan is to endeavor 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 prioritising areas for which further assessment and consideration of noise mitigation measures. 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.

The present action planning areas within the County of Donegal have been identified and are listed below;

- N15 route from Drowes River in the townland of Magheracar to a point 106m southeast of the junction between Bridgestreet and the N15 in Lifford. This route bypasses the towns of Bundoran, Ballyshannon and Donegal Town. The route traverses through the towns of Ballybofey, Stranorlar and Lifford and villages of Killygordan, Liscooley and Castlefinn.

- N56 route from the Roundabout in the townland of Drumlonagher to the junction between the R263 and the N56 in the townland of Aghayeevoge. This route bypasses Donegal Town but passes through some residential/industrial areas to

the west of the town and bypasses the village of Mountcharles while it goes through the villages of Inver, Dunkineeley and Bruckless.

- N56 route from the Polestar roundabout in the townland of Ballyraine to the Pramerica Roundabout in the townlands of Knocknamona/ Windyhall.

- N13 route from the junction between the N13 and the N15 in the townland of Stranorlar to Bridge End to a point 1.1km south east of the junction between the R238 and the N13 in the townland of Bunnamayne. This route bypasses the villages of Drumkeen, Manorcunningham and Newtowncunningham.

- N14 route from the Polestar Roundabout in the townland of Ballyraine to the Dry Arch Roundabout in the townland of Bunnagee and a second section of the N14 route from the Roundabout junction between the N13 and N14 in the townland of Raymoghey to the Roundabout junction between the N14 and N15 in the townland of Townparks and located in the town of Lifford.

- R229 route from the Polestar Roundabout to Station Roundabout to Oatfield Roundabout to the Hospital Roundabout and on to the Pramerica Roundabout where it joins in with the N56. This route is within the urban area of Letterkenny.

- R250 route from Station Roundabout in the townland of Letterkenny to Ballymacool Roundabout in the townland of Ballymacool.

- R245 route from a point 0.39km southwest of the junction between the R245 and the N56 in the townland of Ballyraine (Creamery Junction) to the junction between the R245 and the L-5884-1 (Woodlands NS).

- R238 route from a point 0.5km north of the R239 (at Leo's Café) in the townland of Ballyederowen to the junction of the L1871 (at the Halfway House) in the townland of Tievebane.

- R238 route from Liberty Bridge in the townland of Craig located in the village of Muff to the junction between the R238 and the R240 in the townland of Carrowkeel.

In summary the results of the application of Matrix A for noisy areas indicate that there are approximately 109 residential dwellings affected throughout the action plan area. For the most part these are spread out sporadically along the national routes with a small percentage in urban areas and also a small portion located on the regional roads.

Noise reduction of existing sources of long term environmental noise, where necessary, will be considered as part of the 5 year plan and within the area covered by the strategic noise mapping undertaken by TII in 2017 and as described above. The assessment of relevant actions will use the following approach:

- Review the strategic noise maps to identify priorities through use of decision support matrix (Matrix A & Matrix B)
- Confirm the extent of the noise impact through refined noise modeling and/or short term noise monitoring
- Draw up list of areas for noise mitigation review
- Assess all identified sites
- Feasibility study for possible mitigation measures
- Cost benefit analysis for feasible measures
- Draw up list of cost effective interventions
- Undertake cost effective actions for which funding is available

NOTE: All actions proposed are subject to the availability of funding.

LONG TERM STRATEGY STATEMENT

Donegal 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 2000 (as amended)) to endeavour to ensure that future developments include provisions that will avoid or prevent any harmful effects on the occupants of the proposed development , including annoyance, due to exposure to environmental noise that may arise from major roads that abuts the development, in the interest of residential amenity and public health.

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1.0 Background/Introduction

1.1 Environmental Noise Directive.

The European Community Directive 2002/49/EC (known as the Environmental Noise Directive or "END") deals with the assessment and management of environmental noise.

The aim of the directive is to:

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

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

Noise

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

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

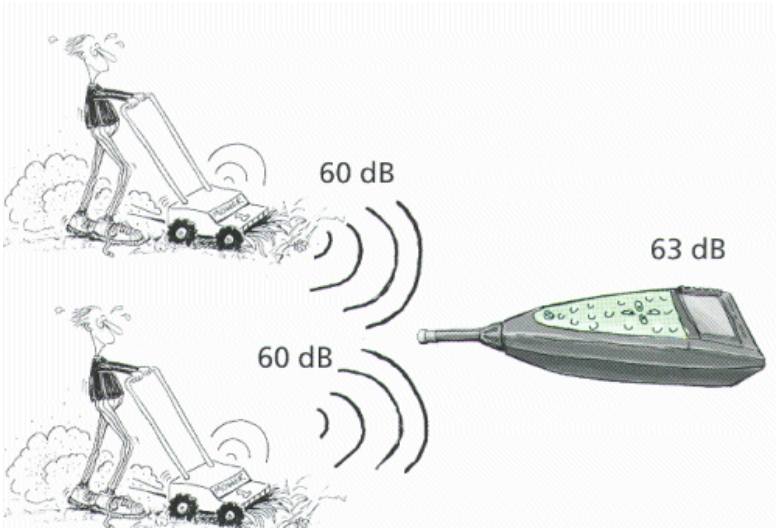


Figure 1.1: Twice the sound energy measures 3 dB more (Bruel & Kjaer Environmental Noise Booklet, 2000)

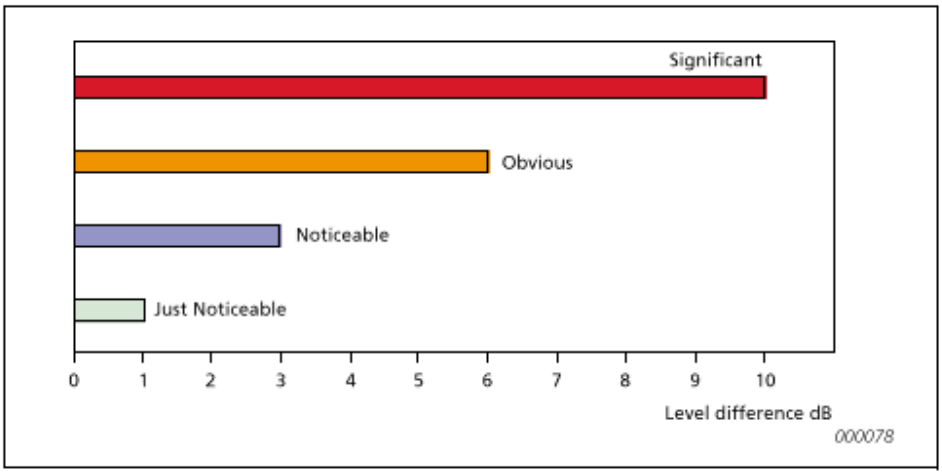


Diagram 1.1a: – Sound Perception (Brüel & Kjær Sound & Vibration Measurement 2000).

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

subjective doubling of loudness. The diagram 1.1a above gives an illustration of sound perception (Brüel & Kjær Sound & Vibration Measurement 2000).

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

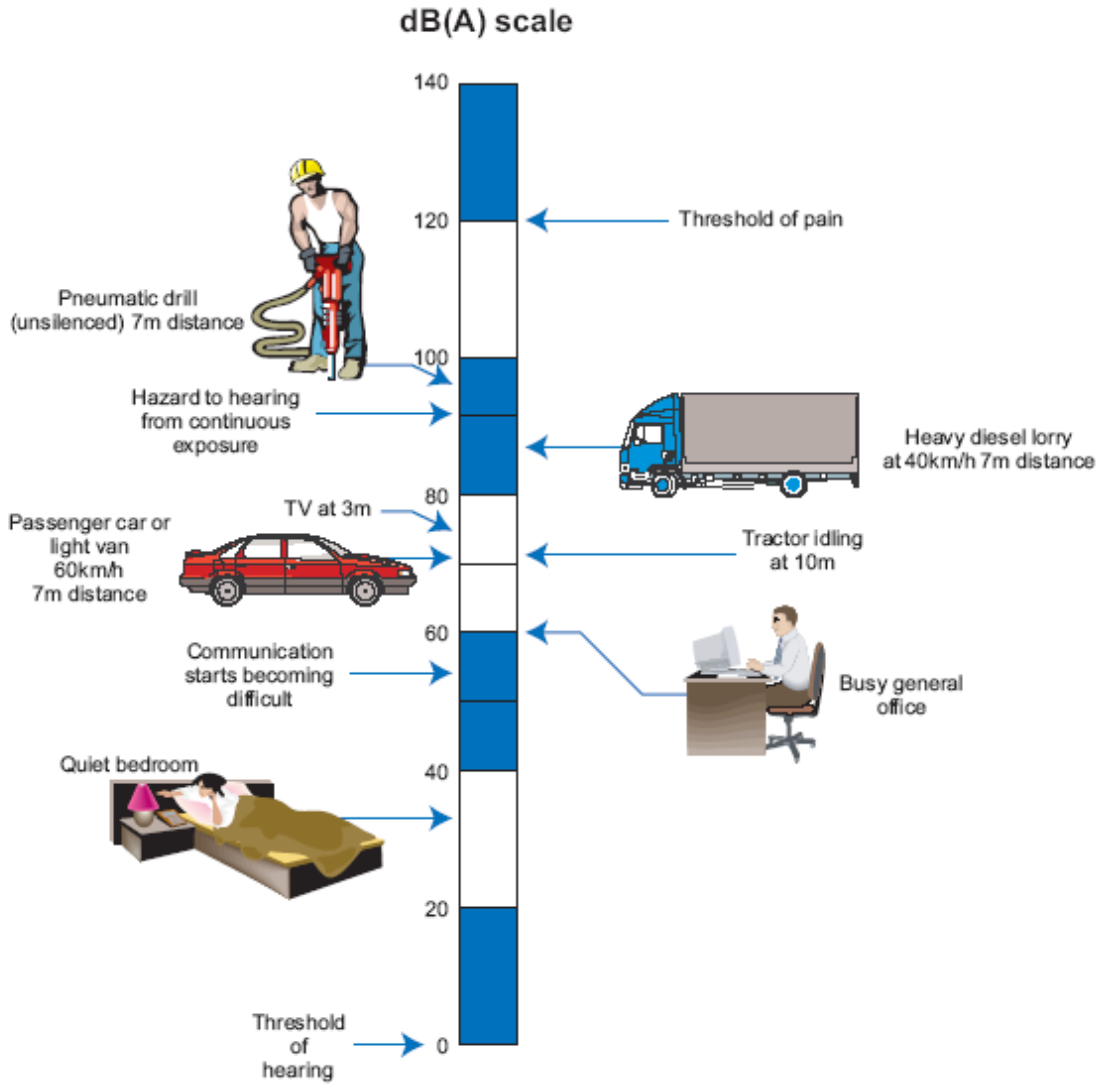


Figure 1.2: The level of typical common sounds on the dB(A) scale (TII Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004)

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

In order to provide a standardised approach to the description of long term environmental noise the Directive specifies the use of two noise level indicators when preparing environmental noise maps and action plans; these two indicators are L_{den} and L_{night}. L_{den} is a noise rating indicator, rather than a sound level, and is based upon the day, evening and night time noise levels, with weightings applied for the different periods. L_{night} is typically used to assess sleep disturbance.

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

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

Effects of Noise

There are many different effects of noise and individuals experience each of them to different degrees. It is known that noise can disturb human activity, by causing distraction or by physically interfering with it. The World Health Organisation (WHO) estimate that at least one million healthy life years are lost from traffic related noise in Western European countries. The effects of noise can also include:

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

Any of these can lead to annoyance and possibly more overt reactions, including complaints. In addition there are physiological effects that can occur, including stress and other health effects. The nature of these effects is much less certain, although it is known that noise can cause a variety of biological reflexes and responses referred to as stress reactions. Whether, over a period of time, these reactions could lead to clinically recognisable disease is unclear. The possibility that severe annoyance might itself induce stress cannot be ignored.
Today, noise tends to be an inevitable consequence of a mature and busy society. People enjoy the benefits from road, rail and air transport and industrial processes and this benefit manifests itself in terms of business, leisure and movement of goods and employment. When managing the environmental noise that comes from transportation noise sources, a balance needs to be struck.

1.2 Purpose and Scope of the Environmental Noise Regulations.
END was transposed into Irish Law by the Environmental Noise Regulations 2006, SI No. 140 of 2006. The regulations provide for the implementation of a common approach within the European Community intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise.

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

Round One:

As part of phase one noise mapping bodies were to make strategic noise maps before the 30th June 2007 for the following:

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

Noise action plans were prepared by action planning authorities where the results of the mapping process indicated that they were above these thresholds. Donegal County Council did not meet or pass any of the thresholds shown above and therefore were not required as part of round one to submit a Noise Action Plan to the EPA.

Round Two:

Noise mapping bodies made strategic noise maps before the 30th June 2012 for the following:

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

Noise action plans were prepared by action planning authorities where the results of the mapping process indicated that they were above these thresholds. Donegal County Council met the thresholds shown above for major roads and therefore were required as part of round two to submit a Noise Action Plan to the EPA.

Round Three:

Noise mapping bodies made strategic noise maps in December 2017 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.

Draft Noise action plans were prepared by all the action planning authorities under Round 3. The draft plan was submitted to the EPA on the 14th March 2018 for review. Comments were received from the EPA on the 11th April 2018 and the draft plan was revised accordingly and made available for Public Consultation starting between June and August 2018, with final submission from the public to be made on or before the 21st August 2018. Final Plans or amended plans revised on foot of the extended strategic noise maps must be prepared and submitted to the EPA by September 2018. The Final Draft Plan will be submitted to the EPA by September 2018.

Should submissions be received during the period for final submissions outlined above that would require amendments to the Final Draft Plan, then these changes will be made and the Final Plan submitted to the EPA by the 10th September 2018.

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

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 are as follows:

1.3.1 Noise Mapping Bodies:

- For major national roads, Transport Infrastructure Ireland (TII) 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;
- For major airports, the relevant airport authority is the noise mapping body, on behalf of the action planning authority concerned;
- For major railways, Iarnród Éireann or the Railway Procurement Authority, now TII, as appropriate, is the noise mapping body on behalf of the action planning authority concerned;
- Each local authority is the action planning authority for major roads in the local authority area;
- For the agglomeration of Dublin, Dublin City and County Councils; and
- 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/agglomeration is located.

The Environmental Protection Agency (EPA) is the national authority for the purposes of the regulations.

1.4 Key Phases

1.4.1 Identification of areas to be mapped.

In Donegal, 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 do not apply.

The definition of a major road for the third noise mapping/action planning phase of the regulations is a road with more than 3 million vehicles per annum. The National Primary route between Bundoran and Lifford (N15), Letterkenny and Derry (N13), Letterkenny and Lifford (N14) and a section of the N56 were identified by the TII as roads in Donegal with this level of vehicle movement based on traffic count data.

Sections of the Regional Road routes R229, R238, R245 and R250 were also identified by the Donegal Local Authority as roads in Donegal with this level of vehicle movement based on traffic count data in 2016.

The following is a list of the areas identified;

- N15 route from Drowes River in the townland of Magheracar to a point 106m southeast of the junction between Bridgestreet and the N15 in Lifford. This route bypasses the towns of Bundoran, Ballyshannon and Donegal Town. The route traverses through the towns of Ballybofey, Stranorlar and Lifford and villages of Killygordan, Liscooley and Castlefinn.

- N56 route from the Roundabout in the townland of Drumlonagher to the junction between the R263 and the N56 in the townland of Aghayeevoge. This route bypasses Donegal Town but passes through some residential/industrial areas to the west of the town and bypasses the village of Mountcharles while it goes through the villages of Inver, Dunkineeley and Bruckless.

- N56 route from the Polestar roundabout in the townland of Ballyraine to the Pramerica Roundabout in the townlands of Knocknamona/Windyhall.

- N13 route from the junction between the N13 and the N15 in the townland of Stranorlar to Bridge End to a point 1.1km south east of the junction between the R238 and the N13 in the townland of Bunnamayne. This route bypasses the villages of Drumkeen, Manorcunningham and Newtowncunningham.

- N14 route from the Polestar Roundabout in the townland of Ballyraine to the Dry Arch Roundabout in the townland of Bunnagee and a second section of the N14 route from the Roundabout junction between the N13 and N14 in the townland of Raymoghey to the Roundabout junction between the N14 and N15 in the townland of Townparks and located in the town of Lifford.

- R229 route from the Polestar Roundabout to Station Roundabout to Oatfield Roundabout to the Hospital Roundabout and on to the Pramerica Roundabout where it joins in with the N56. This route is within the urban area of Letterkenny.

- R250 route from Station Roundabout in the townland of Letterkenny to Ballymacool Roundabout in the townland of Ballymacool.

- R245 route from a point 0.39km southwest of the junction between the R245 and the N56 in the townland of Ballyraine (Creamery Junction) to the junction between the R245 and the L-5884-1 (Woodlands NS).

- R238 route from a point 0.5km north of the R239 (at Leo's Café) in the townland of Ballyederowen to the junction of the L1871 (at the Halfway House) in the townland of Tievebane.

- R238 route from Liberty Bridge in the townland of Craig located in the village of Muff to the junction between the R238 and the R240 in the townland of Carrowkeel.

The areas are also identified in the Strategic Noise Maps Lden and Lnight contained in Appendix C.

1.4.2 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 Lden to greater than 75dB Lden, in 5dB bands, and from 50dB Lnight to greater than 70dB Lnight, 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

For the third phase of implementation of the Regulations, TII prepared strategic noise maps for all major roads in the country, including national and non-national roads with more than 3 million vehicles per annum. The major roads were identified based on traffic flow data up to 2016. The year in which the traffic counts were taken was a typical year. In Donegal, the route between Bundoran and Lifford (N15), Letterkenny

and Lifford (N14), Letterkenny and Derry (N13) and sections of the N56, R229, R238, R245 and R250 were identified as major roads in Donegal with more than 3 million vehicles per annum.

TII ran computerised noise modelling programmes for the relevant roads and generated GIS grids of noise levels as an output of the noise modelling process.
The model preparation was carried out using ArcGIS while model calculation used predictor v11.2, grid calculations & façade point calculations and all calculations were performed over tiles 10km x 10km (grid).

In December 2017 the modeling was completed and the GIS Environment section generated GIS polygon contour layers from these grids for the following decibel bands:

Lden:	**Lnight:**
55-59	50-54
60-64	55-59
65-69	60-64
70-74	65-69
>/=75	>/=70

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 area covered by the noise action plan is those areas identified by noise mapping as being affected by environmental noise from the major noise sources. The action plan refers 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 Lden value of 55dB(A) or greater or an Lnight value of 50dB(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 finalising action plans.

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

1. *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:

2. *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.*

It is the policy of Donegal County Council to engage in public consultation with our citizens in regards to policies and plans developed by Donegal County Council for Donegal, in accordance with national guidelines and best practice.

1.4.3.4 Public Consultation

In developing the Noise Action Plan and in accordance with the Department of Public Expenditure and Reforms publication *Consultation Principles & Guidelines (November 2016)* and the EPA document *Guidance Note for Noise Action Planning for the first round of the Environmental Noise Regulations 2006* (July 2009) updated June 2018 (Draft), Donegal County Council published a Draft Noise Action Plan and sought responses and feedback from statutory bodies and the general public inviting submissions by 21st August 2018. Appendix G gives a full list of stakeholder organisation consulted.

As part of the wider public consultation (and as per Appendix H) Donegal County Council made copies of the Draft Noise Action Plan available to access by the public at both Letterkenny Public Services Centre, Donegal Town Public Services Centre, Road Design Office Lifford and by placing an electronic version on the County Council website.

1.4.3.5 Response to the public consultation

Appendix H details the results and outcomes of public consultation.

1.4.3.6 Handling the responses

Information that has been identified by the respondent as being of a sensitive nature or confidential will have their response dealt with appropriately. Where respondents identified their response as confidential, this information will not to be published by the Authorities. However all respondents were made aware that Donegal County Council are subject to the provisions of the Freedom of Information Act 1997 and if asked the Council may have no option but to release the information in accordance with the requirements of the said legislation.

1.4.3.7 Next step in the process

After the Noise Action Plan has been amended, the final report will go to the County Manager for approval. At that stage, copies of the Noise Action Plan will be made available to access by the public at both Letterkenny Public Services Centre and Donegal Town Public Services Centre and by placing an electronic version on the County Council website. Copies will also be available at a reasonable cost from the Road Design Office, County .House, Lifford, Co. Donegal.

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, on a prioritised / 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.

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. "The draft I-INCE publication "A Global Approach to Noise Control Policy" classifies three areas which require noise policies:

- Occupational Noise
  - *Unwanted sound in the workplace, indoors or outdoors, caused by sources in the vicinity of a workplace;-*
- Community Noise (also referred to as 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; and*
- Consumer Product Noise
  - *Unwanted sound at the position of a user or bystander of a noise producing product over which an individual may have some control, including noise in passenger compartments of vehicles, but excluding occupational and community noise.*

As the Regulations are concerned only with Community Noise and Environmental Noise, there will be no further discussion on Occupational or Consumer Product Noise which are covered by separate regulations namely;
"Safety, Health and Welfare at Work (Control of Noise at Work) Regulations 2006 (S.I. No. 371 of 2006)" and "European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006 (S.I. No 241 of 2006).

Within Community Noise there are a number of individual items which require consideration and management:

- Community Noise

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

The 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 left opened.

It must be noted that the suggested measures above does not protect the external environment around the noise sensitive location from community/environmental noise.

A fully encompassing noise management policy in relation to community/environmental noise needs to provide guidelines, targets and possibly limits for each of these individual items, backed up by legislative powers and Regulations as appropriate."

Many of the above items may be addressed through the planning process for new or altered developments having regard to the National Guidelines.

2.2 Current Community Noise Management Situation

The EPA notes in its Guidance documents 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 2.2.6):

2.2.1 Environmental Protection Agency Act, 1992

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

- **S.106:** gives the relevant Minister certain powers to regulate noise that may give rise to a nuisance or be harmful to health or property; These powers may include imposing noise limits, either exceedence values or emission values, controlling sources of noise and imposition of charges for noise pollution;

- **S.107:** gives powers to local authorities and the EPA to serve notice to take steps to control noise from any premises, process or work;

- **S.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. S.108 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.

The powers set out within the EPA Act largely relate to the control of noise nuisance, and therefore may be applicable to neighbourhood noise, music industry or other such activities. At present there is no statutory guidance on the application and use of the Act, however, within the framework of the Regulations the EPA does have the powers to develop such guidance.

2.2.2 IPPC and Waste Licensing

Noise conditions are routinely imposed as part of an IPPC licence. The relevant guidance is set out in the EPA NG4 publication "Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)". This document contains suggested noise limits for daytime, night-time, and evening with said limits to be applied to "*sensitive locations*".

Daytime (07:00 to 19:00hrs) – 55dB LAr,T;
Evening (19:00 to 23:00hrs) – 50dB LAr,T;
Night-time (23:00 to 07:00hrs) – 45dB LAeq,T.

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 Wind Energy Planning Guidelines

With specific regard to wind energy developments, this DoEHLG document suggests a *"lower fixed limit of 45dB(A) or a maximum increase of 5dB(A) above background noise at nearby noise sensitive locations*". The latter requirement may be relaxed in areas with low background noise levels. A fixed limit of 43dB (A) at night time is deemed

appropriate, as there is no requirement to protect external amenity. Revision of this guidance is ongoing.

2.2.4 Quarries and Ancillary Activities

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. Suggested noise limit values are 55dB $(A)_{LAeq,\ 1hr}$ during the daytime and 45dB$(A)_{LAeq,\ 15\ min}$ during the night time although more onerous values may be appropriate in areas with low levels of pre-existing background noise. In respect to blasting, reference is made to EPA guidance to the effect that *"Blasting should not give rise to air overpressure values at the nearest occupied dwelling in excess of 125 dB(Lin) max. peak with a 95% confidence limit".* Revision of this guidance is ongoing.

2.2.5 Building Regulations

The current Irish Building Regulations call for certain constructions to offer "reasonable resistance" to both airborne and impact sound. In the absence of any form of objective criterion, reference is often made to the guidance values put forward in the "Similar Construction" method described in Technical Guidance Document E (2014).

The Department of the Environment, Community and Local Government (DECLG) published new Building Regulations pertaining to sound in December 2014. An updated and enhanced Technical Guidance Document (TGD) E Sound followed in January 2015.

The key aspects of the new guidance may be summarised as follows:

- For the first time in Ireland, minimum standards of sound insulation performance have been used to define 'reasonable resistance to sound';
- Reverberation in common internal parts of buildings has been introduced as an issue requiring consideration, and;
- Mandatory pre-completion testing is required in order to demonstrate compliance with the requirements of the regulations.

2.2.6 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. Donegal Planning Authority will impose conditions on any grant of permission, in appropriate circumstances, to avoid or prevent the harmful effects, including annoyance that is likely to arise due to exposure to environmental noise.

Transport Infrastructure Ireland has published the document "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*", which sets out the procedure to be followed in respect of the planning and design of national road schemes. In addition TII published the document "Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes" in 2014. Also TII intend to publish standards documents relating to noise and vibration in the context of planning and construction of (proposed) national roads in early 2019.

Other useful reference guidance has been published, including the following:-

- The Department of the Environment, Heritage and Local Government (DoEHLG) has published the following documents relating to sustainable development in the urban environment (re: guidance document):
- Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities), March 2018;
- Sustainable Residential Development in Urban Areas: Guidelines for Planning Authorities, May 2009;
- Urban Design Manual: A best practice guide (A companion document to the Draft Planning Guidelines on Sustainable Residential Development in Urban Areas), 2009; and
- The document dealing with Design Standards for New Apartments calls for *"attention at the design and construction stages to prevent undue noise transmission between units"*. There is no mention of appropriate design goals or the methodology to be employed, other than reference to Part E of the Building Regulations (see below).

The consultation draft guidelines for Sustainable Residential Development highlight the need to
"Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience". 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.

The Urban Design Manual lists Privacy & Amenity as one of twelve key issues, with specific reference to the need to prevent sound transmission in homes by way of appropriate acoustic insulation or layout. There is some comment in relation to the use of appropriate building materials and also the zoning of dwellings to minimise the potential for excessive noise transfer. However, it should be understood that the Planning Code regulates the use of the land/structures and acoustic insulation and construction standards is primarily regulated through the Building Control Code.

2.3 County Planning Policy

2.3.1 Donegal County Development Plan 2012-2018

The Donegal County Development Plan 2012-2018 recognises the significance of addressing noise issues in a land-use planning context, including any potential noise pollution in relation to proposed Economic Development within the County.
The County Development Plan also recognises the importance of setback distances for proposed developments from public roads. Section 10.2.11 of the Donegal County Development Plan 2012-2018 details the building line and boundary line setback requirements for Non National roads and National roads. The justification for the set-back related primarily to the need to facilitate for potential future road widening/realignment, whilst having a consequential benefit in terms of mitigating potential harmful effects due to exposure to environmental noise from road traffic. Good acoustic design in line with Professional Practice Guidance on Planning & Noise (ProPG May 2017) is a useful tool as there is no Local or National Guidance on Noise. Revision of this guidance is ongoing.

2.3.2 Building Line Requirements

National Roads

T-P-17 “It is a policy of the Council to require that all new development proposed adjacent to existing and planned National Primary roads is set back 50m from outside edge of running carriageway unless existing buildings have formed an established building line in which case the new buildings may follow the established building line”. Revision of this guidance is ongoing.

Non National Roads

A minimum of 25m setback will be required from centreline of carriageway on Regional Roads and 15m setback will be required from centreline of carriageway on Local Roads. Where existing buildings have formed an established building line, new buildings may follow the established building line, and the proposed set back may not be required. Revision of this guidance is ongoing.

3.0 DESCRIPTION OF THE ACTION PLANNING AREA

3.1 County Donegal

County Donegal or Dún na nGall is located in the North West of Ireland. It is part of the Border Region and is also located in the province of Ulster. It is named after the town of Donegal. Donegal County Council is the local authority for the county. The population of the county is 158,755 according to the 2016 census.

Donegal has borders with only one county in the Republic of Ireland, Leitrim and borders with counties of Derry, Tyrone and Fermanagh in Northern Ireland. It is the largest county in Ulster and the fourth largest county in the Republic of Ireland with an area of 4,841 square kilometres, which represents roughly 8.5% of the state's land mass.

A predominantly coastal county it is bounded by the Atlantic from Donegal Bay in the south west to Lough Foyle in the north east. It has a deeply indented coastline forming natural sea loughs, of which both Lough Swilly and Lough Foyle are the most notable.

The county is the most mountainous in Ulster consisting chiefly of two ranges of low mountains with the Derryveagh Mountains in the north and the Bluestack Mountains in the south and Mount Errigal at 749 metres (2,457 ft) the highest peak. The Slieve League cliffs are the sixth-highest sea cliffs in Europe, while Malin Head is the most northerly point on the island of Ireland.

The climate is temperate and dominated by the Gulf Stream, with warm, damp summers and mild wet winters. Two permanently inhabited islands, Arranmore and Tory Island, lie off the coast, along with a large number of islands with only transient inhabitants. Ireland's second longest river, the Erne, enters Donegal Bay near the town of Ballyshannon. The River Erne, along with other Donegal waterways, has been dammed to produce hydroelectric power. The River Foyle separates part of County Donegal from parts of both counties Derry and Tyrone.

3.2 Population Data

In 1841 Donegal had a population of 296,448 and in 1971 the population of Donegal had dropped to 108,344 which is a 63% decline in the population for the period 1841 to

1971. The first increase in the population of County Donegal was between 1971 and 1979 where an increase of 12% was recorded.
Donegal experienced its next most significant increase in population since 1979 between the years 2006 to 2011 when a population of 161,137 was recorded in 2011, compared with 158,755 in 2016, representing a decrease of 1.1% in five years.
Analysis of the Census Report indicates increasing populations in both the urban areas and rural areas with an aggregate increase of 21% in urban areas and 6.5% in rural areas in the period 2006 – 2011 and an aggregate decrease of 12.5% in urban areas and 17.5% in rural areas in the period 2011-2016.

3.3 Transport Infrastructure in County Donegal

3.3.1 Road Network

There are approximately 6275km of roads in County Donegal. There are four National Primary Routes; the N3 Ballyshannon to Beeleck, the N14 (Letterkenny to Lifford), the N13 (Letterkenny to Derry), N15 (Bundoran to Lifford). All four National Primary Routes comprise approximately 160km in length. There is one National Secondary Routes in the County (N56) comprising approximately 160km.
The majority of the road length in County Donegal is made up of Regional (785km) and Local Roads (5,330km), a reflection of the predominantly rural nature of the county. Traffic count data indicated that traffic flows along the N13, N14 and N15 of the National Primary Roads in Donegal and on a section of the N56 National Secondary road and on certain sections of Regional Routes were above the 3 million vehicles per annum threshold for noise mapping/action planning specified for the third phase of implementation of the regulations.

3.3.2 Rail Network

Rail noise mapping/action planning is not required for Donegal as no rail network exists.

3.3.3 Air Transport

County Donegal is served by Donegal Airport, which is located at Carrickfinn, Kincasslagh, Co. Donegal. The airport is approximately a 15 minute drive from Dungloe

and Gweedore, and 45 minutes from Letterkenny. Donegal Airport is situated on the west coast in the area of the Rosses/Gweedore.

The number of movements per year at Donegal Airport is lower than the threshold required for Action Planning.

4.0 RESPONSIBLE AUTHORITY FOR ACTION PLANNING

4.1 Name and Contact Details:

Road Design Office
County House
Donegal County Council
Lifford
Co. Donegal E-Mail: noiseactionplan@donegalcoco.ie

4.2 Description of other bodies of relevance.

Donegal County Council is responsible for the maintenance and upkeep of all National, Regional and Local Roads in the county. Donegal County Council in consultation with the TII and the Department of Transport is responsible for the design and construction of new roads in the county. To date the most common noise reduction measure currently in place in Donegal has come about on foot of the development of National Road Schemes, and the use of relevant guidance. A number of schemes have been constructed in Donegal which are in the plan area.

The following are National Road Improvement Schemes completed in Donegal since 1999:

Scheme Name:	***Approx. Length (Km)***	***Year of Opening:***	***Noise Mitigation Measures on the Scheme (Yes/No)***
N15/N56 Donegal Town By-Pass	*8.5Km*	*1999*	*No*
N15 Clar to Barnesmore Realignment Scheme	*2.5Km*	*2001*	*No*
N56 Mountcharles Bypass	*2.5Km*	*2001*	*No*
N15 Ballyshannon/Bundoran Bypass	*11.5Km*	*2006*	*Yes – Sound adsorbing barrier boards placed in Ballyshannon north of Erne crossing, benefiting*

			approximately 130 households.
N56 Mountain top to Ellistrin	*5Km*	*2006 (Phase 1)* *2008 (Phase2)*	*No – Monitoring carried out and no locations for noise mitigation identified.*
N56 Cloghbolie Boyoughter	*3Km*	*2012*	*No*
N56 Boyoughter Kilkenny	*5Km*	*2016*	*No*
N15 Blackburn Bridge	*3Km*	*2016*	*No*
N56 Kiltoy	*1Km*	*2016*	*No*
N56 Mountcharles Drumbeigh (At Construction)	*2.8Km*	*2019*	*Yes, but may be an option to design out.*
N56 Kilkenny Letterilly (At Construction)	*3.2Km*	*2019*	*No*
N56 Coolboy Kilmacrennan (At Construction)	*3.3Km*	*2019*	*Yes*

Traffic calming measures have also been implemented in a number of areas of the county.

4.3 Future Schemes Proposed

4.3.1 National Primary Routes:

It is an objective of the Donegal County Development Plan 2012-2018, T-O-6: To protect the corridors and routes and acquire the lands necessary for transportation improvement projects as identified in Chapter 10 of the plan. Revision of this guidance is ongoing.

It is an objective of Donegal County Council to encourage the completion of a series of National Primary and National Secondary Road Improvements which include the following that may have an influence on the Noise Action Plan areas:

The TEN-T or the Trans-European Transport Network consists of three National Primary Roads in Donegal - the N15/N13 at Ballybofey/ Stranorlar, the N56/N13 Letterkenny to Manorcunningham and the N14 Manorcunningham to Lifford.
The TEN-T is defined as a selection of strategic transport corridors throughout the European Union (EU) that have been identified to play a key role in the mobility of goods and passengers through the EU. The TEN-T network in Donegal, a TII Funding Project, and is one of the largest infrastructural projects in Donegal.
These three sections of the TEN-T network in Donegal have been prioritised for improvement to address existing safety and operational issues, and the public is currently being invited to view and comment on the constraints within the defined study area.
Improving the N15 to provide a high-quality route servicing Ballybofey and Stranorlar as well as connecting the North West region to the National Primary road network via Sligo. Improving this connectivity will improve connections to “insular and outermost regions”;

- Improvement of the connectivity between the N56 and the N13/N14 will furthermore improve the accessibility of north and west Donegal and reconnect this peripheral region to the National Primary network, and the international TEN-T network which continues in Northern Ireland;
- Similarly, upgrading the N14 by the provision of a high-quality road with no direct accesses would improve the connectivity between County Donegal and Northern Ireland, creating a more cohesive North West region, in addition to improving links to the A5 Western Transport Corridor and subsequently to Dublin.

4.3.2 National Secondary Routes:

It is an objective of the Council to encourage the upgrade of the following routes that may have an influence on the Noise Action Plan areas:

a) N56 Mountcharles to Inver
b) N56 Blue Banks
c) N56 Letterilly Glenties
d) N56 Dungloe Cloghbolie
e) N56 Drumbeigh Inver
f) N15 Ballybofey Stranorlar
g) N56/N14 Letterkenny to Manor Roundabout
h) Manor Roundabout to Lifford
i) N14/A5 Link
j) N56 Four Lane Road

4.3.3 Regional Route Proposals:

The key strategic routes for reservation in Letterkenny are listed below. They shall be protected under the policy framework and mapping of the Letterkenny Area Plan.

a) Leck Road Western/Eastern Link (Part of the Southern Relief Road)
b) Swilly Road & Bridges (Southern Relief)
c) Northern Relief Road
d) Western Relief Road
e) Joe Bonnar Link
f) Port Blaney Link
g) Justice Walsh Link

4.3.4 Other Regional Route Proposal

a) Buncrana Inner and Outer Relief Roads (R238)
b) Muff Bypass (R238)
c) Burnfoot Bypass (R238)
d) Killybegs Bypass

5.0 SUMMARY OF NOISE MAPPING RESULTS

5.1 Overview of the preparation of the noise map

The National Primary, National Secondary and Regional routes described earlier, have been identified as major roads in County Donegal for the purpose of implementation of phase two of the Directive and the Regulations. This was established from the TII's and Donegal County Councils traffic count data. A strategic noise map was prepared for these sections of road in 2017.

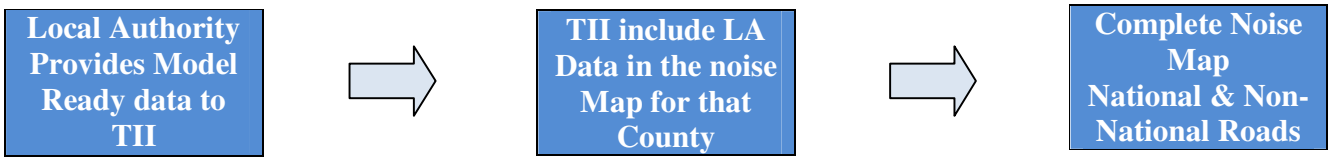
The following is a summary of the process in the preparation of the noise maps.

5.1.1 Responsible Authorities

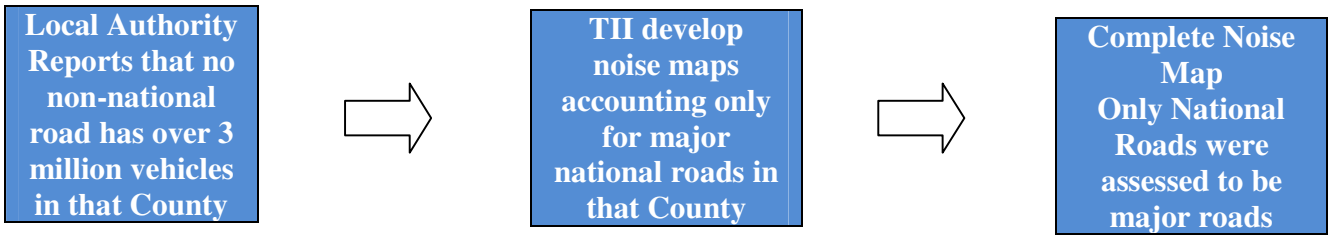
The Environmental Noise Regulations require the TII to develop noise maps for every major road classified as a national road while the responsibility of mapping non-national roads rests with the relevant Local Authority within whose functional area the road lies.

In February 2016, a centralised approach to the noise mapping of major roads outside agglomerations was adopted. Through this centralised approach, one central body, TII, developed strategic noise maps for all major roads outside agglomerations, encompassing both national and non-national roads. Non-national roads were mapped by TII on the behalf of the relevant Local Authority provided that authority participated in the centralised approach and provided 'model-ready' data to the central body for calculations.

All Local Authorities with major roads within their jurisdiction participated in this centralised approach.



CASE 1: Non-national roads are deemed to be a major road when carrying in excess of 3 million vehicles per year



CASE 2: No non-national road deemed to be a major road.

5.1.2 Noise Mapping Process

Figure 1.3 displays the overview of the noise mapping process as presented in the EPA's Guidance Note for Strategic Noise mapping (EPA Guidance Note for Strategic Noise Mapping (Version 2)). There are three main phases to the process:

1) Preparation of datasets in the GIS Environment;
2) Noise calculations; and
3) Post Processing and Analysis.

Phase 1 was conducted separately for national and non-national roads while Phase 2 and Phase 3 merged datasets from national and non-national roads to form one complete model.

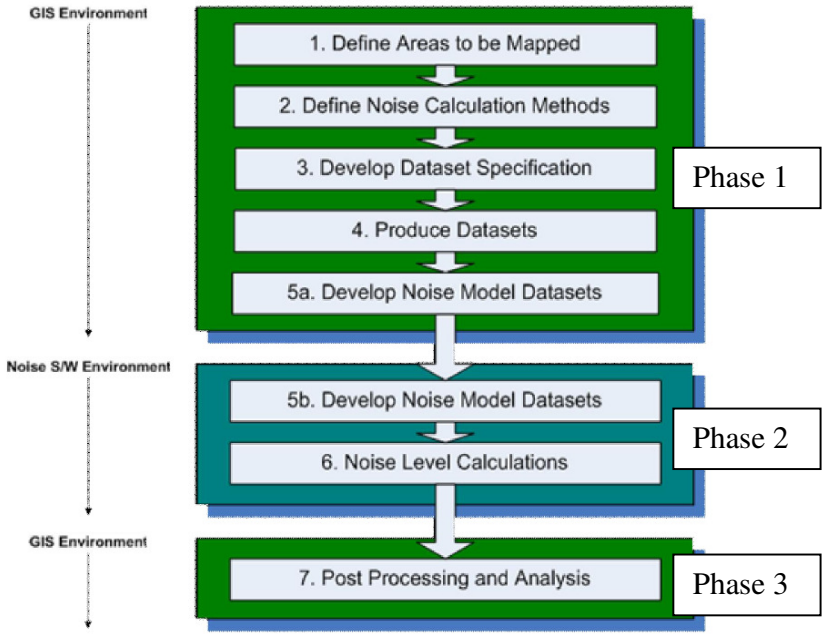


Figure 1.3: Overview of the noise mapping process

Population exposure assessments were then performed on a County by County basis.

5.1.3 Review of Second Round (2012) Noise Maps

In 2016 the EPA issued a Guidance Note when undertaking a review of Round 2 Noise Maps

The EPA Guidance Note for Strategic Noise Mapping notes:

> *The Regulations introduce a continuing obligation on noise mapping bodies to review and, where necessary, revise each strategic noise map every 5 years, or sooner, as requested by the EPA, or when a material change in environmental noise in the area concerned triggers a revision of the relevant noise action plan. The EPA "Guidance Note for Noise Action Planning", July 2009, suggests that a noise action plan should be revised due to a material change if "it is known, or thought likely, that greater than 10% of the exposed population within the area*

of an action plan have experienced a change in the prevailing noise situation of greater than 3dB L_{den} or L_{night}.

Therefore, Noise Mapping Bodies who undertook strategic noise mapping for the first round in 2007 have an obligation to undertake a review of the strategic noise maps and, where necessary, revise them. For the basis of this review of Round 1 strategic noise maps ahead of Round 2, the NMBs should consider that a revision of the strategic noise maps is required if it is known, or thought likely, that greater than 10% of the exposed population within the area of an action plan have experienced a change in the prevailing noise situation of greater than 1dB(A) L_{den} or L_{night}.

Under the requirements of the second round of the Directive (2012), the flow thresholds for major roads have been reduced in comparison to the first round (2007), i.e. for the first round all roads with an AADT in excess of approximately 16,000 vehicles had to be mapped, for the second phase this threshold was reduced to approximately 8,000 vehicles. This has resulted in a requirement to undertake strategic noise mapping for sections or roads and railways which were not included within the first round in 2007.

For the second phase, and irrespective of the approach to the first phase, the Regulations designate the Local Authorities as the Noise Mapping Bodies for non-national major roads, and each Local Authority has a statutory responsibility to ensure that strategic noise mapping of non-national major roads within their area is undertaken.
Due to the significant change in extents of roads to be mapped for the second phase, TII decided the best course of action was to revise all noise maps developed during the first phase for the second phase of noise mapping.
For the third phase, Donegal County Council has a statutory responsibility to ensure that strategic noise mapping of national and non-national major roads within their area are considered.

5.1.4 Calculation Methodology

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

The UK national computation method 'Calculation of Road Traffic Noise' (CRTN) adapted for use under the Regulations is described within the following documents:

- Department of Transport publication, 'Calculation of Road Traffic Noise', HMSO, 1988
- Converting the UK Traffic Noise Index L10,18h to EU Noise Indices for Noise Mapping, TRL Project report PR/SE/451/02, 2002; and
- Defra, Method for Converting the UK Road Traffic Noise Index LA10,18h to the EU Noise Indices for Road Noise Mapping, st/05/91/AGG04442, 24th January 2006.

In their Guidance Note for Strategic Noise Mapping the EPA recommended that the UK CRTN methodology be used for the assessment of road traffic noise levels for the second round of strategic noise mapping. It notes that the method should be used with particular reference to the following:

- The NANR 93 project report;
- DMRB Volume 11 Section 3 Part 7 HD 213/11 Annex 4,
- Additional advice to CRTN procedures;

- TRL Project report PR/SE/451/02, Converting the UK Traffic Noise Index $L_{10,18h}$ to EU Noise Indices for Noise Mapping, 2002; using traffic count information, particularly for the night period, wherever practicable.

Thus CRTN, taking cognisance of the supplemental reports identified above, was used for all noise mapping calculations

5.1.5 Data Sources

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

TII Traffic Model

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

Local traffic counts carried out in 2017 were also used for the purpose of forecasting traffic volumes on the Regional Roads in the County. The assessment year was typical.

Aerial LiDAR

In 2009, the TII published a notice for tender for an aerial LiDAR survey of approximately 3,019km of the Irish national road network. The survey corridor was 1,200m in width. The survey was completed in early 2011 and outputs included 1 metre contours for the entire survey area, building height information for buildings within the survey corridor and a digital terrain model (Figure 1.4).

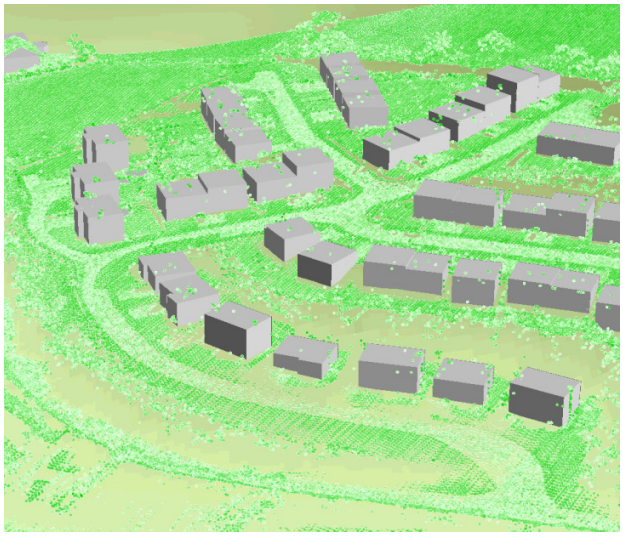


Figure 1.4: Sample Point Cloud from Aerial LiDAR Survey

GeoDirectory

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

Corine Database

The European Environment Agency's (EEA) CORINE Land Cover 2012 dataset is a European-wide vector land parcel product derived from satellite imagery R2V processing. The CORINE dataset was developed in the framework of the CORINE programme to establish a computerised inventory on land cover. The dataset was used for making environmental policy as well as for others such as regional development and agriculture policies. For noise calculation, the dataset can be used to provide information on the land cover distribution.

Ordnance Survey of Ireland (OSI)

OSI maintain a wide range of mapping products that are available for use within strategic noise mapping. Some datasets required additional licensing to be taken out. Some datasets included for analysis;

- PRIME2 digital mapping data model:
  - 1:1,000 scale in urban areas;
  - 1:2,500 in suburban areas; and
  - 1:5,000 in rural areas.
- OSI Boundaries:
  - County, ED and Townlands boundaries.
  - OSI High Resolution Ortho Photography:

Central Statistics Office (CSO)

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

Roads Database

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

As-Built Drawings

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

5.1.6 Software and Hardware

All datasets were prepared and collated in a GIS Environment prior to importing them to the noise mapping programme. All attributes were consistent through the datasets thus ensuring an efficient export.

Details of the noise mapping system are presented in Tables 1 - 3.

Modelling Hardware
Microsoft Windows 10
Standard x64 Edition
Intel® Core™ i5-4590@3.30GHz with 19.9 GB of RAM

Table 1: Hardware Specifications

Modelling Software
Predictor V11.2
Predictor Calculation Client V8.21
Predictor Analyst V3.40

Table 2: Software Specifications

Calculation Settings
Fetching Radius 1,500m
Standard Tile Size 10km x 10km
Standard Tile Buffer 2,000m

Table 3: Calculation Settings

5.2 Presentation of Results.

5.2.1 Noise Contour Maps

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

In order to provide a standardised approach to the description of long term environment noise the Directive specifies the use of two noise level indicators when preparing environment noise maps and action plans, these two indicators are L_{den} and L_{night} . L_{den} is the noise rating indicator, rather than a sound level, and is based upon the day, evening and night time noise levels with weightings applied for the different periods. L_{night} is typically used to assess sleep disturbance.
The strategic noise maps for the N14, N15, N13, N56, R229, R238, R245, and R250 are attached in Appendix C. Each map shows colour-coded 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 A):

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

50dB 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

Annex VI of the END requires that the estimated number of people living in dwellings exposed to various noise levels on the most exposed façade. In order to derive these results the following datasets were used

- population data from the CSO
- address data from the geo-directory
- façade points output by the noise model (describing the noise level at the facade of every building),
- building polygons, used by the noise model

The population data used was from Census 2016 and is using the '*small areas*' geographies which are areas of between 50 and 200 dwellings, downloaded from the CSO website, as well as ED's, and Administrative counties. The address data used was Geo-Directory from quarter 2 2016. Façade points were the outputs of noise modeling. For the noise mapping 2017 project a noise model was created with a 2km buffer on each county. By analysing all these datasets together it was possible to estimate the average number of people for each residence in the test area (the small area) and assign a noise level to that building. These estimates were collated to derive an overall exposure level for the County. The estimated population exposure for Donegal is shown in tables 4 and 5:

Table 4: Population Exposure Data, (L_{den})

L_{den}	Approximate Number of People	L_{den}	Approximate Area (km^2)
55-59	3,590	>55	61
60-64	2,691		
65-69	1,873	>65	12
70-74	401		

>75	14	>75	0

Table 5: Population Exposure Data, (L_{night})

L_{night}	Approximate Number of People	L_{night}	Approximate Area (km^2)
50-54	2,871	>50	32
55-59	2,180		
60-64	535	>60	5
65-69	23		
>70	0	>70	0

From the tables above and taking the limits as set out in the EPA guidance document it can be roughly estimated that a possible 415 people will be affected L_{den} and 558 people will be affected L_{night}. (Refer to paragraph 6.1 for limits)

Table 6: Dwelling Exposure Data, (L_{den})

L_{den}	Approximate Number of Dwellings	L_{den}	Approximate Area (km^2)
>55	4,012	>55	61
>65	1,136	>65	12
>75	8	>75	0

Table 7: Dwelling Exposure Data, (L_{night})

L_{den}	Approximate Number of People	L_{den}	Approximate Area (km^2)
>50	2,611	>50	61
>60	309	>60	12
>70	0	>70	0

5.3 Limitations of the Noise Mapping Process.

5.3.1 Limitations of the computer modeling method

The data used to generate the noise maps was obtained from computer modeling rather than from actual noise measurement. This approach is in accordance with the Noise Regulations. 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 modeling 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 Donegal 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.

Where mitigation measures are implemented, further monitoring will be carried out to quantify the effectiveness of the measures.
Data obtained from computer modeling 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 The vehicle count data

The noise maps produced by TII for the routes identified in the Strategic Noise Mapping phase 3 were based on the latest TII traffic count data 2016 and Donegal County Council traffic counts data 2016. The 2016 traffic counts taken on the Regional Road Network were the most up to date traffic count data available to the Council. A traffic count survey on Regional Roads was carried out in 2017 and will also feed into this review of the Noise Action Plans.
The traffic figures will be updated as part of an ongoing process and compared to traffic count data submitted for strategic noise mapping.

6.0 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 (ref EPA Guidance document) 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}

Using these thresholds for L_{den} and the figures given in tables 4 & 5, it is estimated that there is a population of 415 people in 104 residencies who experience road traffic noise levels in excess of the assessment threshold.

Using threshold for L_{night} and the figures in table 4 & 5, it is estimated that there is a population exposure of 558 people in 309 residencies that experience road traffic noise levels in excess of the assessment threshold.

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 (ref). 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, rail, airport, agglomeration).

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 Donegal, the noise source is the same for all assessments (i.e. noise from major roads). It has been suggested in EPA Noise Guidance Document (ref) that each Action Planning Authority may impose an additional weighting factor to the matrix to include the number of residents at each address. However Donegal 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 Donegal 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.

The table for Decision Support Matrix A is shown on the next page and the method applied by Donegal County Council to identify and prioritise noisy areas.

Table 6: Matrix A: Decision Support Matrix to Identify and Prioritise Noisy Areas

	Priority Matrix			
	Location:			
Decision Selection Criteria		**Score Range L_{den}**	**Score Range L_{night}**	**Sub Total**
Noise Band(dB(A))	<45	5	6	
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75-79	4	6	
	>=80	5	7	
Type of Location	City Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Locations	3	3	
		3	3	
	Quiet Area Recreational open space	2	2	
Type of Noise Source	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			Total Score	

Application of "Matrix A: Decision Support Matrix to Identify and prioritise noisy areas". The matrix was applied through Mapinfo with a score range applied to each building contained in the geodirectory 2017 for "noise band" (L_{den} & L_{night}), "Type of Location" and "Source". Within the geodirectory the buildings are assigned a use for either commercial (C) or residential (R). Using this information Donegal County Council were able to map the results of applying Matrix A and show locations where clusters or single dwelling equaled or exceeded the threshold of 17.

From analysing the results, clusters of building and single dwellings have been identified along the National Routes and Regional Routes. Therefore it is established from the model that the threshold levels have been exceeded in areas along these routes and these locations are now included in the shortlist for further assessment. A total of 109 buildings within the action plan area are affected.

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

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

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.

A possible means of identifying areas for consideration as quiet areas may be to cross reference the areas of the noise maps below 55 db L_{day} & 45 db L_{night} with a dataset of public open spaces to produce a list of potential quiet areas such as recreational areas, playing fields, playgrounds, public parks and gardens, beaches, nature reserves, cemeteries, river banks and canals.

At present, no quiet areas have been identified in the action plan area for which noise mapping has been carried out. Quiet areas will be considered and reviewed as part of the implementation of the noise action plan. Any possible designations which may be recommended would go to public consultation prior to submission to the Minister for

adoption. This work will be carried out as part of the programme of works for the Action plan.

Decision support Matrix 'B' can be applied (Table 7) 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.

Noise sensitive locations identified for further assessment will be examined using Matrix A and Matrix B.

Table 7: Matrix B: Decision Support Matrix to Preserve Quiet Areas:

	Priority Matrix			
	Location: Example			
Decision Selection Criteria		**Score Range L_{den}**	**Score Range L_{night}**	**Sub Total**
Noise Band(dB(A))	<45	0	0	
	45-49	1	2	
	50-54	2	3	
	55-59	3	4	
Type of Location	Noise Sensitive	3	3	
	Quite area	3	3	
	Recreational open space	2	2	
Type of Noise Source	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			Total Score	

The noise maps will be examined to identify any noise sensitive locations situated within the action planning area (i.e. alongside the routes N15, N14, N13 and section of the N56, R229, R238, R245 and the R250). Any noise sensitive locations identified will be tested against Matrix 'A' 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. In both scenarios 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.

Noise Sensitive locations are locations for which a quieter noise environment is preferable for effectively carrying out the functions of the particular location. The types of public open spaces which could be considered appropriate to include within the assessment are:

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

And possibly extend to locations such as:

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

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

7. 0 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 incline. 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; and
- 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 (ref European Federation for Transport and Environment). Vehicle noise limits are set in EU legislation and address propulsion noise for new vehicles.
Noise emissions are determined by means of a vehicle drive-by test, which measures the noise emitted as the vehicle drives by at 50kph and accelerates in front of the microphone position. The current drive by test does not include provision for evaluating noise performance in typical urban stop-start traffic situations at lower speeds, where engine noise is the dominant source. Another failing is that the test parameters are set in such a way that vehicles can be designed to pass the test but are considerably louder when driven on the road. A new type of vehicle test has recently been introduced which corrects for these limitations.

The EU noise limits are a valuable tool for ensuring that noise emissions are minimized for new vehicles. However they only apply to new vehicles. As vehicles age, the level of

noise produced by the engine increases with wear and tear on the parts but there is presently no requirement in Ireland to assess noise emissions from older vehicles. Another practical limitation to the noise emission limits is that while a newly purchased vehicle may comply with its emission limit, modifications to or removal of the vehicle silencer will result in an excessively noisy vehicle.

Installation of a sports exhaust on a vehicle is not illegal at present and is a major contributor to nuisance noise from road vehicles.

Tyre rolling noise emissions have increased over time, predominantly due to the trend towards wider and heavier tyres. Tyre/road contact begins to dominate the noise emission above 30km/h for passenger cars and above 50km/h for lorries. For this reason, it was deemed necessary to regulate tyre/road noise separately at EU level. The rolling noise emissions of tyres are regulated under the following EU regulations.

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

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

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

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

As from 1 November 2012 the EU Energy labels for tyres must be available at point of sale and show information on fuel consumption, wet grip and rolling noise levels, as shown in Figure 1.5.

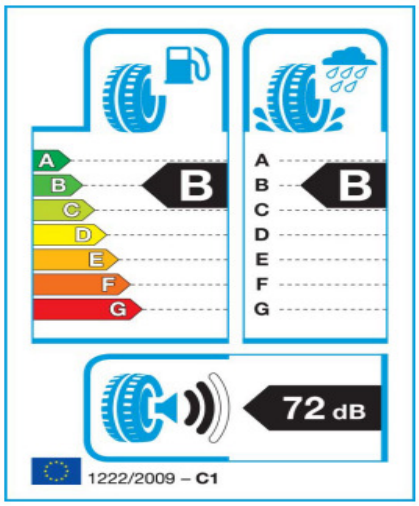


Figure 1.5: Example of EU Energy label for tyres

7.2 Measures To Reduce Noise From Major Roads.

7.2.1 Existing Developments.

There are a 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 by-pass is obviously the most effective method of minimising the numbers of dwellings likely to be affected by the road noise. Where areas are identified by further assessment as requiring possible mitigation, it may be possible to install noise barriers on major roads.

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

Changes to the road surface to use porous asphalt may be appropriate in some instances; the road surface must be regularly cleaned to keep the pores free of sediment otherwise the sound absorbing properties of the surface are reduced. Porous surfaces are more effective at higher vehicle speeds and are not as effective within 50kph speed restriction zones.

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 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; through the implementation of "Building Line Setback" distances specified in TII guidelines and the Donegal County Development Plan 2012-2018 (Re: Section 2.3.1 above); 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 planning authority. Revision of this guidance is ongoing.

7.3. Proposed Measures for Donegal 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.
Donegal County Council will also strive to reduce traffic density as much as possible on a countywide basis by:

Promoting Public Transport:

The Donegal County Development Plan 2012-2018 includes the following objectives:

- T-O-1: To achieve quality strategic International, National and Regional links to sea, air and rail from Donegal to other Gateways, locations and markets.

- T-O-2: To provide for high quality connectivity within the County in line with the Core Strategy.
- T-O-5: To safeguard the carrying capacity and safety of National roads and other strategic routes.
- T-O-6: To protect the corridors and routes and acquire the lands necessary for transportation improvement projects as identified in Chapter 10.
- T-O-7: To support the provision of a rail link between the Letterkenny/Derry linked Gateway and also to Sligo and to support the reopening of the Western Rail Corridor from Athenry to Sligo.
- T-O-8: To support access to and appropriate development of ports and airports.
- T-O-9: To support the development and expansion of public transport services including The Rural Transport Initiative.
- T-O-10: To support appropriate enhancement of access to offshore islands.
- T-O-11: To strengthen cross border transportation links (including the A5 Western Transport Corridor) and support the development of new links.

It is a policy of the Council to require that adequate cycle lanes, stands and ancillary facilities be provided in appropriate development proposals having regard to the standards as set out in the Development Plans Technical Standards. Revision of this guidance is ongoing.

Future development of parking facilities:

It is a policy of the Donegal County Development Plan 2012-2018 to support and facilitate the provision of parking facilities at appropriate locations, including the provision of bus parking facilities within and on the edge of towns and villages, and at viewing areas at important tourist destinations and routes. Revision of this guidance is ongoing.

Improved traffic management and smoothing traffic flows:

Under the County Development Plan 2012-2018, it is a policy of the Council to facilitate the appropriate development of affordable, multimodal transport solutions that offer

communities and future generations real transport choices such as park and ride; pedestrian and cycling; bus and taxi services; and ancillary infrastructure.
To support this policy it is an objective of Donegal County Council to continue to carry out Traffic and Transport Assessment studies or Traffic Management Plans for larger Towns to examine improved traffic management measures such as:

- *Pedestrianisation;*
- *Designation of cycle routes;*
- *Use of one-way systems; and*
- *Modifications to junction types.*

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

Where relevant, Donegal County Council will investigate the feasibility of extending speed limit zones under the planned 5 year speed limit review process. For major national roads, this would be done in consultation with TII. The most recent review was completed in April 2017.

Donegal County Council will ensure that council-owned fleet vehicles are maintained to an adequate level to minimise unnecessary noise generation. Revision of this guidance is ongoing.

7.3.2 Protection measures for future improvement:

Donegal County Council will seek to utilise the planning process as necessary:

- To incorporate the aims of the present and future noise action plans into the development plan and into relevant local area plans. Special consideration

should be given to zoning objectives, and established settlements within the area.

- Where major development is proposed it may be necessary to accompany such proposals with evidence that the development shall not be exposed to harmful environmental noise that may arise from any major road that abuts the site. Evidence should include a sound impact assessment report that specifies appropriate mitigation measures which should be incorporated into the development proposal.
    - *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*
    - *On a case by case basis based on location to protected corridors within development plan, size, type of development / noise sensitive*
- Where major 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 require that all future developments are designed and constructed so as to minimise noise disturbance.

The ability to deliver the foregoing may be limited having regard to the existing provisions of the current Planning, Building and Fire Acts.

Donegal County Council will consider requiring a higher standard of façade and window insulation for all residential developments located beside major roads, potentially with a pre completion sound insulation test required prior to habitation. Donegal County Council will consider requiring a higher standard of façade and window insulation for residential development beside major roads.
Protection measures for future improvement may also include extending speed limit restrictions around built-up areas. Revision of this guidance is ongoing.

7.3.3 Monitoring Measures:

Data presented in the noise maps shown in Appendix C 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.

The Roads Authority will endeavour to ensure that sufficient traffic count data is obtained in the next three years to enable all major roads to be identified for mapping purposes by 2022, for the preparation of noise maps in 2022, as required in the next phase of implementation of the regulations.

Donegal County Council will liaise with adjoining Local Authorities and TII to ensure that adequate expertise is available between the authorities to enable the next phase of noise mapping to be carried out. This expertise may be sourced within the local and regional authority or via TII or external consultants.

7.3.4 Consultative Measures

In areas where Donegal County Council do not have a regulatory role, but where improvements in regulatory controls will effect a reduction in environmental noise from major roads, Donegal 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. Recommend to the Planning Authority that measures proposed in this action plan be included in any review of the Donegal County Development Plan and in relevant Local Area Plans.
iv. Support the role of the RSA in these tasks.
v. Liaising with the EPA to establish limit values for community noise.

8.0 Public Participation

A preliminary draft of this Noise Action Plan was initially prepared and submitted to the Environmental Protection Agency (EPA) for their comments as required by the Environmental Noise Regulations. Amendments were then made to the 'draft' Noise Action Plan to incorporate the comments received from the EPA. The 'draft' Noise Action Plan was subsequently placed on public display at Donegal County Council Offices.

The Draft Noise Action Plan was put on public display for 6 weeks, beginning on 22nd June 2018, with a further 2 weeks for submissions, ending at 4.00pm on the 21st August 2018. During this time, written submissions were invited. A notice was placed in the local newspapers, the Donegal Democrat, Donegal News and Inish Times in advance advising the public of the locations where and when the plan was on display.

A copy of the Draft Noise Action Plan was put in the following public buildings:

- Donegal Public Services Centre, Donegal Town
- Letterkenny Public Services Centre, Letterkenny
- Road Design Office, Donegal Co. Co., County House, Lifford

A copy of the Draft Noise Action Plan is also available to download on the Donegal County Council website. (Donegal County Council website: www.donegalcoco.ie)

In addition to seeking submissions from the general public, the following stakeholders have been asked to comment on the 'draft' Noise Action Plan;

- Environmental Protection Agency
- Transport Infrastructure Ireland
- Leitrim County Council
- Strabane District Council
- Derry City Council
- The Department for Regional Development (DRD) (Northern Ireland)
- Department of Communications, Climate Action & Environment
- Department of Transport, Tourism & Sport
- An Taisce

The 'draft' Noise Action Plan was also forwarded to relevant stakeholders (e.g.) National Road Design/Regional Design Office and the Planning Section for comment. The Environment and Emergency Planning Strategic Policy Committee (SPC) were also advised that the draft Noise Action Plan was being placed on public display.

8.1 Responding to the Consultation Process

Members of the public are asked to submit any observations, comments or suggestions in relation to the plan in writing to **The County Secretariat Office, Donegal County Council, County House, Lifford, County Donegal** marked **"Submission - Draft Noise Action Plan"** or emailed to noiseactionplan@donegalcoco.ie before 4.00 p.m. on 21st August 2018. Consultees are asked to use the response forms provided in Appendix I (page 103 & 104), or alternatively the form can be downloaded on the Donegal County Council Website.

8.2 Access to Consultation Process

Donegal County Council will make all responses available to the public under The Freedom of Information Act (Amendment) 2014, Data Protection (Amendment) Act 2013 and the Department of Public Expenditure and Reforms publication '*Consultation Principles & Guidance' (2016).* All responses can be viewed online on the consultation web pages of Donegal County Council website at:

http://www.donegalcoco.ie/yourcouncil/public%20consultation

8.3 Process Following Consultation

When the consultation period has finished, any amendments arising from the public consultation process will be made and the final draft of the Noise Action Plan will be submitted to the EPA for final review in September 2018.

9.0 IMPLEMENTATION PROGRAMME (FOR LIFE OF NOISE ACTION PLAN, 2018 TO 2023):

9.1 Roles and Responsibilities

Under the Environmental Noise Regulations, 2006, Transport Infrastructure Ireland (TII) is the noise mapping body for major national roads in Donegal. Donegal County Council is the noise mapping body for major non-national roads in the county. Donegal County Council is the Action Planning Authority for major roads in Donegal. There is no rail network in Donegal and volumes of air traffic in the county are below the threshold for noise mapping and so the regulations do not apply to these areas.

Donegal County Council are 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. Donegal County Council are also responsible for identifying major non-national roads that fall under the threshold 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 the implementation of the regulations on behalf of Donegal 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.

9.3 Programme of Works

Year One (2018):

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):

Identify the budget to begin the verification process on the areas of most concern regarding noise exposure. Donegal County Council will initiate a verification process by carrying out on-site noise measurements to confirm the models measurement of noise exposure in these areas.

Identify areas for consideration as Quiet Areas by cross referencing the areas of the noise maps below 55 db L_{day} with a dataset of public open spaces to produce a list of potential quiet areas.

Identify noise sensitive areas within the action plan area and apply the matrix assessment method described in Section 6.2 and 6.1 to identify if further assessment may be warranted (i.e. monitoring).

Draw up list of areas for noise mitigation review.

Undertake consultative measures outlined in 7.3.4 above.

Year Three (2020):

Carry out road traffic counts to verify that existing roads within the action plan area are carrying in excess of three million vehicles per annum.

Ensure that adequate traffic flow data is collected for all roads in the county so that the action plan area can be reviewed or amended if necessary.

Year Three to Four (2021):

Conduct a feasibility study to identify possible mitigation measures from list of areas identified.

Review and revise, if necessary the noise action plan.

Year Five (2022):

Review the success of the action plan

Incorporate action planning measures and best practice environmental noise policy into new Development Plan and Local Area Plans.

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 will 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.

There are a number of risk factors associated with the delivery of this Noise Action Plan, particularly financial risks. Some critical elements of the Action Plan are outside the control of Donegal County Council and will require the approval of other statutory bodies. Also the financial resources required to deliver the programme has yet to be determined and the delivery of the noise action plan will be contingent on adequate funding being available. In view of these uncertainties, it is important that the programme is subject to an ongoing review so as to alert all relevant parties to any change in circumstances.

9.4.2 End of programme review

An end-of-programme review of the action plan will be prepared by December 2022. This review will summarise progress in implementing measures, identify the extended noise mapping/action planning area, highlight aspects of the original action plan which were modified, giving reasons for the modification and recommend measures for future improvement.

10.0 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 e.g. Environment, Planning & Development, Roads & Transportation and Housing.

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 considerably (ref HEATCO). The impact of mitigating measures to address noise nuisance is further complicated because noise is measured on a logarithmic scale and human perception of loudness does not directly coincide with increased sound pressure levels (e.g. a 3dB increase in noise, which represents a doubling in sound pressure level, is the smallest statistically significant increase in loudness detectable by the human ear). To reduce the subjective “loudness” of a noise source by 50% would require a 10dB drop in noise level and may be very difficult to achieve without major investment in noise mitigation. Assigning a monetary cost to the noise nuisance can enable cost benefit analysis to be used as a decision support tool in determining what (if any) noise mitigation measure is to be implemented. For current guidance on CBA refer to D-03 Guide to Economic Appraisal CBA, 2012 or http://publicspendingcode.per.gov.ie/d-standard-analytical-techniques/, also in 2017 the Conference of European Directors of Roads (CEDR) published a report entitled “State of the art in managing road traffic noise: cost benefit analysis and cost effective analysis (Technical Report 2017-03)”.

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 (Lden), per household per year. The validity range of this interim value is between 50/55 Lden and 70/75 Lden and it should be adjusted as new research on the value of noise becomes available.
- The estimate of the change should apply at all initial noise levels, and regardless of the size of any change brought about;

As a preliminary step in carrying out cost benefit analysis on possible noise mitigation measures, Donegal County Council propose to assign the monetary benefit to noise mitigation measures as recommended above (i.e. €25 per dB (Lden) per household per year). The number of households in the immediate area that would potentially benefit from a particular mitigation measure will also be factored into the analysis.

11.0 DRAFT SUMMARY AND CONCLUSIONS

The Donegal County Council Action Plan addresses road noise from action planning areas along the N15, N13, N14, N56, R229, R238, R245 and the R250.

The aim of this round 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 the country 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 Lden and 50dB Lnight, to greater than 75dB Lden and greater than 70dB Lnight, in 5dB bands.

The noise maps for Donegal were prepared based on the roads network in place in the county in 2017. The EPA has estimated that an approximate total of 11,440 individuals are resident within the noise mapping/action planning area.
The effective management of future road noise 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 minimise noise nuisance. For acoustical planning to be a useful tool, it can only be incorporated as a series of objectives into the Local Authority's Development Plans and Local Area Plans. Changes to supporting legislation will be

required in order to effectively implement acoustical planning into the planning process. Revision of this guidance is ongoing.

Future Road Schemes currently at Planning and Design Stage in the vicinity of the action plan area which will be subject to the Noise Action Plan will further aid in the reduction of noise levels along these routes.

The construction of the proposed road schemes in accordance with TII noise guidelines and standards combined with advancements in noise reduction road surfacing materials will further aid in achieving lower noise levels on and in the vicinity of Donegal's National and Regional Roads.

Appendix A

Glossary of Acoustic and Technical Terms

Term	Definition
Agglomeration	Major Continuous Urban Area as set out within the Regulations
Attribute Data	A trait, quality, or property describing a geographical feature, e.g. vehicle flow or building height
Attributing (Data)	The linking of attribute data to spatial geometric data
CRN	The Calculation of Railway Noise 1995. The railway prediction methodology published by the UK Department of Transport.
CRTN	The Calculation of Road Traffic Noise 1988. The road traffic prediction methodology published by the UK Department of Transport.
Data	Data comprises information required to generate the outputs specified, and the results specified
dB	Decibel
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
EC	European Commission
END	Environmental Noise Directive (2002/49/EC)
ESRI	Environmental Systems Research Institute
EU	European Union
GIS	Geographic Information System
INM	Integrated Noise Model
Irish National Grid (ING)	The official spatial referencing system of Ireland

Term	**Definition**
ISO	International Standards Organisation
Metadata	Descriptive information summarising data
NA	Not Applicable
Noise Bands	Areas lying between contours of the following levels (dB): L_{den} <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_d <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_e <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 L_n <50, 50 – 54, 55 – 59, 60 – 64, 65 – 69, >70
Noise Levels	Free-field values of L_{den} L_d, L_e, L_n, and $L_{A10,18h}$ at a height of 4m above local ground level
Noise Level - L_d - Daytime	Ld (or L_{day}) = $L_{Aeq,12h}$ (07:00 to 19:00)
Noise Level - L_e - Evening	Le (or $L_{evening}$) = $L_{Aeq,4h}$ (19:00 to 23:00)
Noise Level - L_n - Night	Ln (or L_{night}) = $L_{Aeq,8h}$ (23:00 to 07:00)
Noise Level - L_{den} – Day/Evening/Night	A combination of L_d. L_e and L_n as follows: L_{den} = 10 * log 1/24 {12 * 10^((L_{day})/10) + 4 * 10^(($L_{evening}$+5)/10) + 8 * 10^((L_{night}+10)/10)}
Noise Level – $L_{A10,18h}$	$L_{A10,18h}$ = $L_{A10,18h}$ (06:00 to 24:00)
Noise Level – $L_{Ar,T}$	$L_{Ar,T}$ = The equivalent continuous A- weighted sound pressure level during a specified time interval, T, plus specified adjustments for tonal character and impulsiveness of the sound.
Noise Level – $L_{eq,T}$	The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T.

Term	Definition
Noise Level – $L_{Aeq,T}$	The A-weighted equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. It is used to describe many different types of noise and can be measured directly with an integrating sound level meter.
Noise Mapping (Input) Data	Two broad categories: (1) Spatial (e.g. road centre lines, building outlines). (2) Attribute (e.g. vehicle flow, building height – assigned to specific spatial data)
Noise Mapping Software	Computer program that calculates required noise levels based on relevant input data
Noise Model	All the input data collated and held within a computer program to enable noise levels to be calculated.
Noise Model File	The (proprietary software specific) project file(s) comprising the noise model
Output Data	The noise outputs generated by the noise model
OSI	Ordnance Survey for Ireland
Processing Data	Any form of manipulation, correction, adjustment factoring, correcting, or other adjustment of data to make it fit for purpose. (Includes operations sometimes referred to as 'cleaning' of data)
QA	Quality Assurance
RMR	The railway noise calculation method published in the Nether lands in 'Reken- en Meetvoorschrift Railverkeerslawaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996'.
Spatial (Input) Data	Information about the location, shape, and relationships

Term	Definition
	among geographic features, for example road centre lines and buildings.
WG - AEN	Working Group – Assessment of Exposure to Noise
XPS	The French road traffic noise calculation method published in 'NMPB-Routes-96 (SETRA-CERTULCPC-CSTB)', referred to in 'Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6' and in the French standard 'XPS 31-133'.

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 urbanised 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).

Lden: (day-evening-night noise 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.

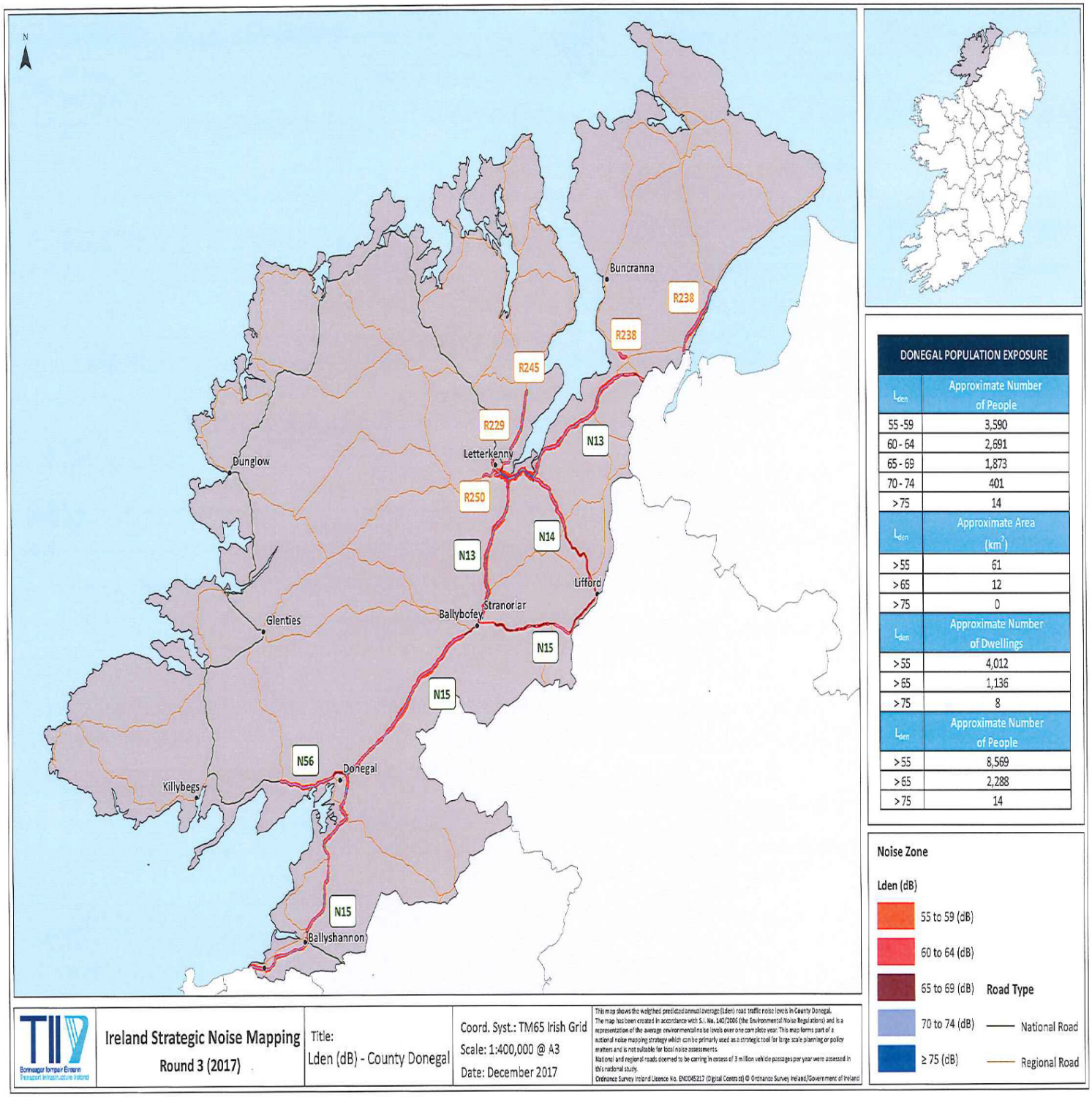
L*day*: (day-noise indicator) shall mean the noise indicator for annoyance during the day period.
This is the average value in decibels for the daytime period
L*evening*: (evening-noise indicator) shall mean the noise indicator for annoyance during the evening period. This is the average value in decibels 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'. Ref UK DOT, Transport analysis guidance, Noise, TAG unit 3.3.2, November 2006.
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 B
Bibliography and References

EU Directive 2002/49/EC relating to the assessment and management of environmental noise (END Directive).
Environmental Noise Regulations, S.I. No. 140 of 2006
Environmental Protection Agency Act 1992
The Building Regulations (1997-2012)
Technical Guidance Document E of the Building Regulations 2014 (Sound)
Environmental Protection Agency "Guidance Note for Noise Action Planning", July 2009.
Environmental Protection Agency G*uidance Note for Strategic Noise Mapping* for the Environmental Noise Regulations 2006, Version 2, August 2011.
The Environmental Protection Agency *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (2016).
The Environmental Protection Agency G*uidance Note on Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3)* (2011).
The Environmental Protection Agency *Environmental Quality Objectives - Noise in Quiet Areas.*
The Transport Infrastructure Ireland *"Guidelines for the Treatment of Noise and Vibration in National Road Schemes"* (2004),
The Department of the Environment, Heritage and Local Government, *Planning Guidelines for Wind Energy Developments* (2006)
The Department of the Environment, Heritage and Local Government, *guidelines for Planning Authorities on Quarries and Ancillary Activities* (2004).
The County Donegal Development Plan 2012-2018
CSO Census data 1996, 2002, 2006, 2011, 2016 www.cso.ie.
Noise Action Plan for Dublin Agglomeration.
Kildare County Council Draft Second Noise Action Plan - 2013

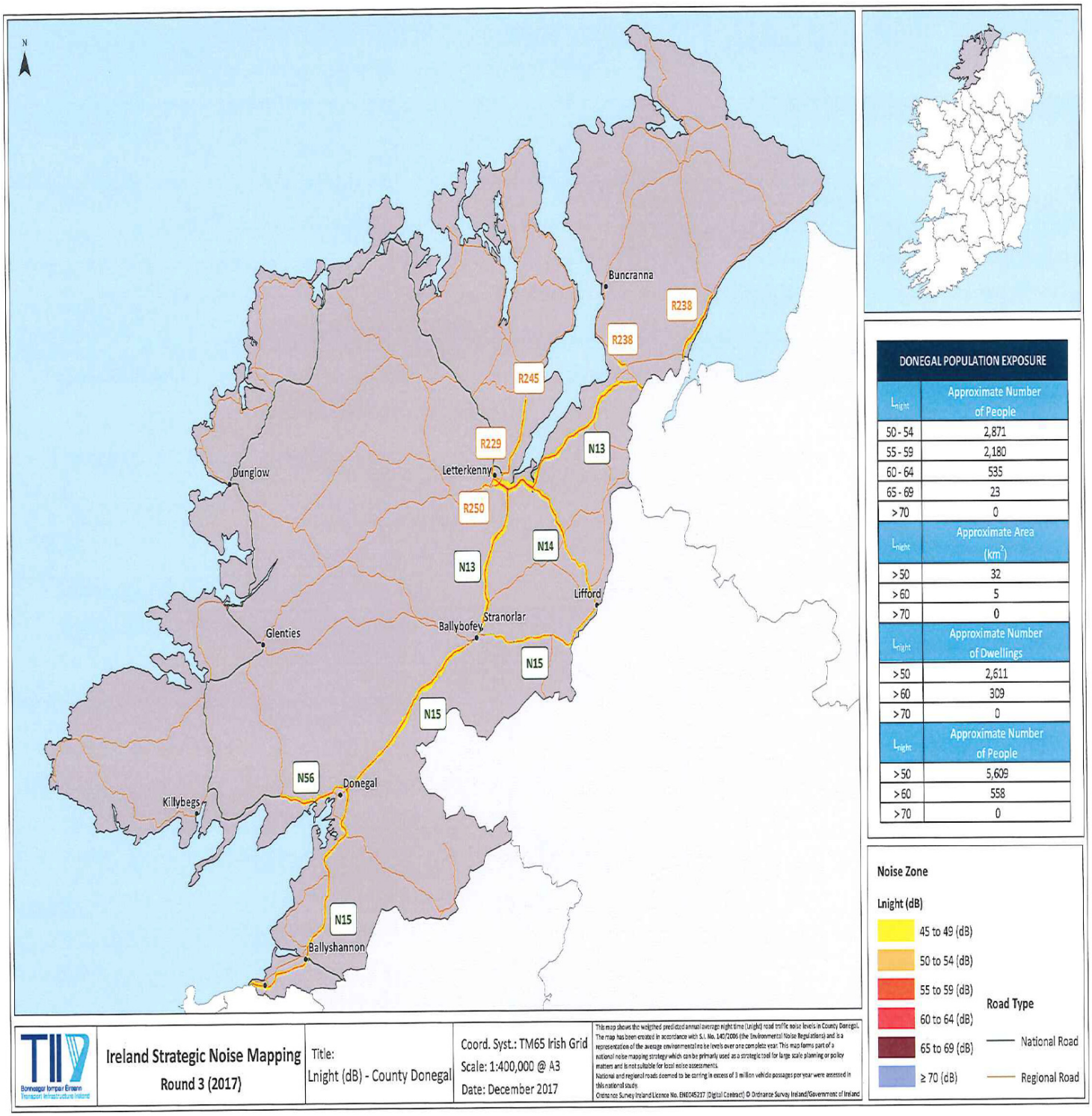
Appendix C

Strategic Noise Maps & Link to Interactive Map



Below is a link to an Interactive Map of the Lden & Lnight mapping for Public Use

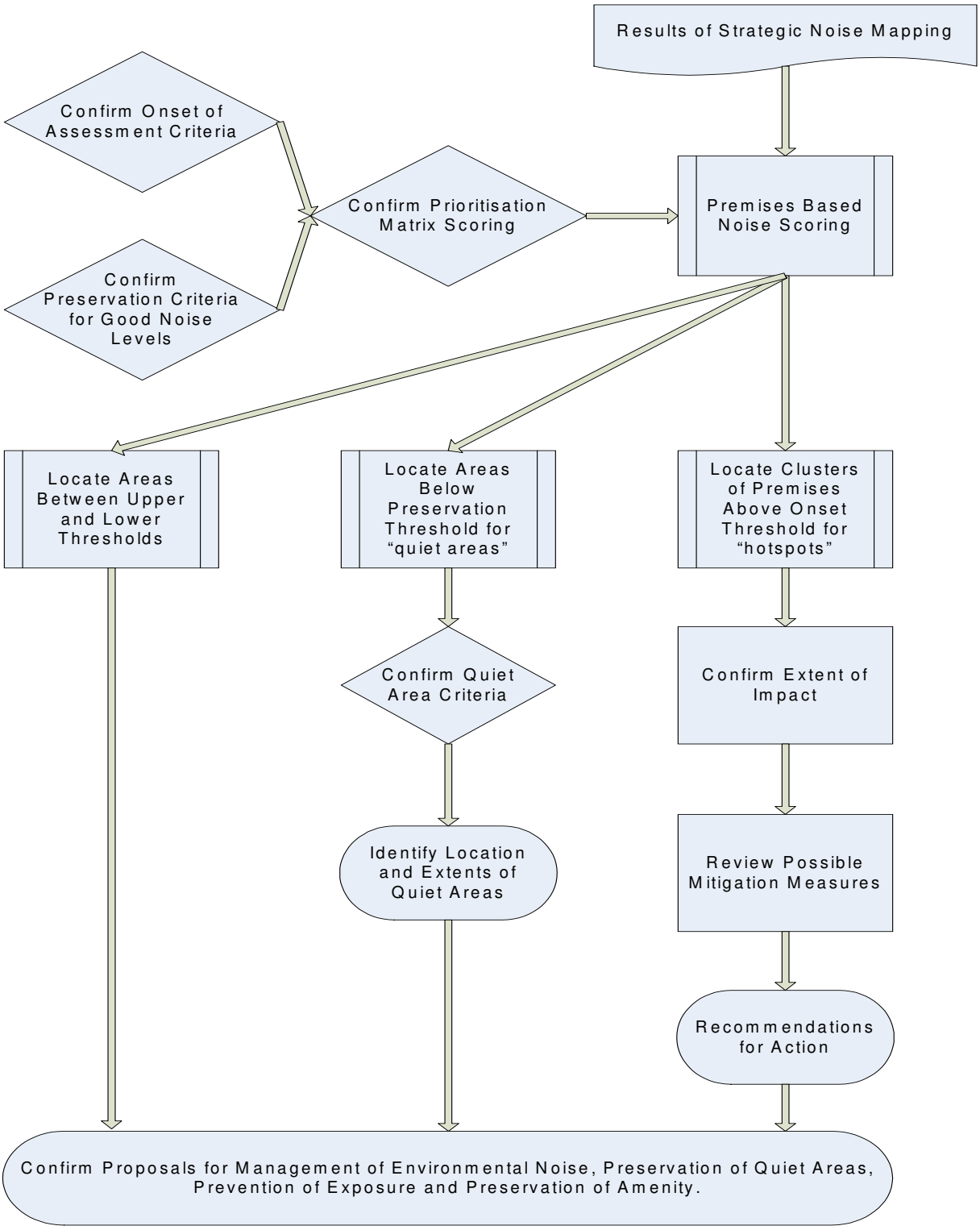
http://arcg.is/1SHvu



Below is a link to an Interactive Map of the Lden & Lnight mapping for Public Use

http://arcg.is/1SHvu

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



Appendix F

Decision Support Matrix

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

Table 1 below presents the prioritisation decision support matrix to be used to support the action planning decision making process, referred to as Table 6 in the main body of the report.

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

Table 1: Example decision support matrix

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

An example of the use of the matrix for a residential property exposed to road traffic noise levels of 71 dB L_{den} and 63 dB L_{night} is shown in Table 1.

Table 1: Example of use of decision support matrix

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

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

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

Appendix G

Consultation - Specified Stakeholders

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

Departments

Environmental Protection Agency
The Department for Infrastructure (Northern Ireland)
Department of Communication, Climate Action & Environment
Department of Transport, Tourism and Sport

Adjacent Planning Authorities

Strabane District Council
Derry City Council
Leitrim County Council
Fermanagh District Council

Local and National Pressure Groups

An Taisce (letterkenny)

NGO and Professional Bodies

Transport Infrastructure Ireland
National Roads Design Office – Donegal Town

Appendix H:

Consultation – General Public

As part of the public consultation process, Donegal County Council made copies of the Draft Noise Action Plan available to access by the public in a number of Public Services Centres within County Donegal, and by placing an electronic version on the County Council website.

H.1 Response

- To be completed post public consultation.
- Final Submissions to be received by the 21st August 2018.
- Four submissions have been received to date.

Appendix I:

Response Form for the Consultation on the draft Donegal County Council Noise Action Plan

1. Are you satisfied with the contents of this Noise Action Plan?
2. Is there anything in the Noise Action Plan you are dissatisfied with?
3. Are there any additional good practices you feel should be included in the Noise Action Plan?
4. Do you have any views on the most appropriate mechanism to keep the Noise Action Plan up to date and to share good practices?

Respondent Information Form

Please complete the details below and return it with your response. This will help ensure we handle your response appropriately. Thank you for your help.

Name:
Postal Address:

1. Are you responding: (please tick one box)
   (a) as an individual □ go to Q2a/b and then Q4
   (b) on behalf of a group/organisation □ go to Q3 and then Q4

INDIVIDUALS

2a. Do you agree to your response being made available to the public (in the Donegal County Council library and/or on the Donegal County Council website)?

Yes (go to 2b below) □
No, not at all □ We will treat your response as confidential

2b. Where confidentiality is not requested, we will make your response available to the public on the following basis (please tick **one** of the following boxes)

Yes, make my response, name and address all available □
Yes, make my response available, but not my name or address □
Yes, make my response and name available, but not my address □

ON BEHALF OF GROUPS OR ORGANISATIONS:

3. The name and address of your organisation will be made available to the public (in the Donegal County Council library and/or the Donegal County Council website). Are you also content for your response to be made available?

Yes □
No □ We will treat your response as confidential

SHARING RESPONSES/FUTURE ENGAGEMENT

4. We will share your response internally with other Donegal County Council policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Donegal County Council to contact you again in the future in relation to this consultation process?

Yes □
No □

Appendix J:

Consultation – Submissions Received & DCC Response

ROB CONNOLLY

From: [redacted]
Sent: 18 July 2018 10:20
To: NOISE ACTIONPLAN
Subject: Submission - Draft Noise Action Plan
Attachments: image001.png; DonegalCoCo_DraftNAP_TII_Submission_18072018_Final.pdf

CAUTION: This email originated from outside of Donegal County Council. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

Dear Sir/Madam,

Please find attached a submission from Transport Infrastructure Ireland on the Draft Noise Action Plan.

Kind regards,
[redacted]

[redacted]
Environmental Policy and Compliance Section
Transport Infrastructure Ireland
Parkgate Business Centre, Parkgate St., Dublin 8, Ireland, D08 DK10
www.tii.ie
[redacted]

1

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

18th July 2018

RE: Donegal County Council Draft Noise Action plan

Dear Sir/Madam,

I refer to your recent correspondence of 22nd June 2018 providing Transport Infrastructure Ireland (TII) with a copy of the Donegal County Council Draft Noise Action Plan for consultation.

Please find our comments below.

Section 2.2.6 Planning

Reference is made to the National Roads Authority (NRA) 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes'. In addition to the NRA Guidelines, published in 2004, the NRA published a 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' in 2014.

Separately, please note that it is intention of TII to publish standards documents relating to noise and vibration in the context of planning and construction of (proposed) national roads in early 2019.

Section 5.1.3 Review of Second Round (2012) Noise Maps

Please note that in 2016, the EPA issued guidance to all Noise Mapping Bodies when undertaking a review of Round 2 strategic noise maps for submission to the EPA under the Environmental Noise Regulations, 2006. Please amend Section 5.1.3 in light of the 2016 guidance issued by the EPA.

Section 10.2 Cost Benefit Analysis

In 2017 the Conference of European Directors of Roads (CEDR) published a report entitled "State of the art in managing road traffic noise: cost benefit analysis and cost effective analysis (Technical Report 2017-03)". This report may be useful in undertaking any cost benefit analysis. I have included a copy of this report as Appendix A of this letter.

General comments

i. Executive Summary: In is stated on Page IV that "*Transport Infrastructure Ireland (TII) following a methodology in EPA guidance based on GeoDirectory data, **that** the approximate number of individuals located within the action planning areas in County Donegal where the noise levels exceed the Lden value of 55dB and Lnight value of 50dB to be 10,871 and 6,6167 respectively*". Please delete "that" with "estimate"

ii. Section 1.3.1: Please insert "(now TII)" after "Railway Procurement Agency"

iii. Section 5.3.2: Please replace "phase 2" with "phase 3".

iv. Throughout the Draft Noise Action Plan, reference is made to 'the TII'. Please delete 'the' in all instances amending to 'TII'.

If you have any queries in relation to our comments above, please do not hesitate to contact me,

Your's faithfully,

[redacted]
Environmental Policy and Compliance Section
Transport Infrastructure Ireland
Dublin 8, D08 DK10

Comhairle Contae
Dhún na nGall
Donegal County Council

www.ccdhunnangall.ie www.donegalcoco.ie

Our Ref: O7996

Donegal County Council
Road Design Office
Lifford
Co. Donegal

XXXXXXXXX
Environment Policy and Compliance Section,
Transport Infrastructure Ireland,
Parkgate Business Centre,
Parkgate St,
Dublin 8,
D08 DK10

07th September 2018

RE: Donegal County Council Draft Noise Action Plan 2018-2023

Dear XXXXXXXX,

Thank you for your submission regarding the above.

Please be advised that the comments raised in your submission dated the 18th July, have been taken into consideration and that the necessary amendments have been made to the Donegal County Council Draft Noise Action Plan 2018-2023.

Rob Connolly
Assistant Engineer
Road Design

Cuir freagra chuig: Oifig Dearadh Bothar, Leifear, Contae Dhún na nGall, Éire | **Please reply to:** Road Design Office, Lifford, Co Donegal, Ireland
Guthán/Tel: 074 9153900 | **Facs/Fax:** 074 9141793 | **Ríomhphost/Email:** info@donegalcoco.ie

ROB CONNOLLY

From: [redacted]
Sent: 20 August 2018 21:02
To: NOISE ACTIONPLAN
Subject: Submission - Draft Noise Action Plan
Attachments: Response Form AM.pdf

CAUTION: This email originated from outside of Donegal County Council. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

See Response Form attached

Thanks
[redacted]

1

Appendix I:

Response Form for the Consultation on the draft Donegal County Council Noise Action Plan

1. Are you satisfied with the contents of this Noise Action Plan?
2. Is there anything in the Noise Action Plan you are dissatisfied with? I notice that the road R238 between Tooban and Ballymacarry Lower although included in the survey is not shown on the noise maps. Can you please clarify this? My home at Tooban is approximately 10m from the R238 road and noise pollution is certainly an issue. Moreover only recently the speed limit on this section of road was raised to 100 km/h making the problem with road noise worse.
3. Are there any additional good practices you feel should be included in the Noise Action Plan?
4. Do you have any views on the most appropriate mechanism to keep the Noise Action Plan up to date and to share good practices?

Respondent Information Form

Please complete the details below and return it with your response. This will help ensure we handle your response appropriately. Thank you for your help.

Name:
Postal Address: [redacted]

1. Are you responding: (please tick one box)
   (a) as an individual ☒ go to Q2a/b and then Q4
   (b) on behalf of a group/organisation ☐ go to Q3 and then Q4

INDIVIDUALS

2a. Do you agree to your response being made available to the public (in the Donegal County Council library and/or on the Donegal County Council website)?

Yes (go to 2b below) ☐
No, not at all ☒ We will treat your response as confidential

2b. Where confidentiality is not requested, we will make your response available to the public on the following basis (please tick **one** of the following boxes)

Yes, make my response, name and address all available ☐
Yes, make my response available, but not my name or address ☐
Yes, make my response and name available, but not my address ☐

ON BEHALF OF GROUPS OR ORGANISATIONS:

3. The name and address of your organisation will be made available to the public (in the Donegal County Council library and/or the Donegal County Council website). Are you also content for your response to be made available?

Yes ☐
No ☐ We will treat your response as confidential

SHARING RESPONSES/FUTURE ENGAGEMENT

4. We will share your response internally with other Donegal County Council policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Donegal County Council to contact you again in the future in relation to this consultation process?

Yes ☒
No ☐

Comhairle Contae Dhún na nGall
Donegal County Council

www.ccdhunnangall.ie www.donegalcoco.ie

Our Ref: O7994

Donegal County Council
Road Design Office
Lifford
Co. Donegal

XXXXXX XXXXXXX
XXXXXX
XXXXXXXX
Co. Donegal

07th September 2018

RE: Donegal County Council Draft Noise Action Plan 2018-2023

Dear XXXXXXX,

Thank you for your submission regarding the above.

I write to you regarding the query you had in relation to the stretch of road outside your premises in Tooban, Burnfoot.

The present action planning areas as outlined in the Draft NAP read as:

"R238 route from the Bridge End Roundabout junction with the N13 in the townland of Carrowreagh to the junction between the Looking Glass Brae road and the R238 in the townland of Ballymacarry Lower" (This was for the second round of noise mapping).

This should have read as:

"R238 route from a point 0.5km north of the R239 (at Leo's Café) in the townland of Ballyederowen to the junction of the L1871 (at the Halfway House) in the townland of Tievebane". (This is for the third round of noise mapping).

I apologise for the confusion.

Noise reduction of existing sources of long term environmental noise, where necessary, will be considered as part of the 5 year plan and within the area covered by the strategic noise mapping. The assessment of relevant actions will use the following approach:

- Review the strategic noise maps to identify priorities through use of decision support matrix (Matrix A & Matrix B)
- Confirm the extent of the noise impact through refined noise modeling and/or short term noise monitoring
- Draw up list of areas for noise mitigation review
- Assess all identified sites
- Feasibility study for possible mitigation measures

Cuir freagra chuig: Oifig Dearadh Bothar, Leifear, Contae Dhún na nGall, Éire | **Please reply to:** Road Design Office, Lifford, Co Donegal, Ireland

Guthán/Tel: 074 9153900 | **Facs/Fax:** 074 9141793 | **Ríomhphost/Email:** info@donegalcoco.ie

Comhairle Contae
Dhún na nGall
Donegal County Council
www.ccdhunnangall.ie www.donegalcoco.ie

- Cost benefit analysis for feasible measures
- Draw up list of cost effective interventions
- Undertake cost effective actions for which funding is available

Please note that all of the actions above are subject to the availability of funding.

I hope this answers your concerns.

Rob Connolly
Assistant Engineer
Road Design

Cuir freagra chuig: Oifig Dearadh Bothar, Leifear, Contae Dhún na nGall, Éire I **Please reply to:** Road Design Office, Lifford, Co Donegal, Ireland
Guthán/Tel: 074 9153900 I **Facs/Fax:** 074 9141793 I **Riomhphost/Email:** info@donegalcoco.ie

ROB CONNOLLY

From: [redacted]
Sent: 15 August 2018 15:16
To: NOISE ACTIONPLAN
Subject: Re Public Consultation for Noise Action Plan N 56
Attachments: Noise Action Plan N56 Response form[redacted]

CAUTION: This email originated from outside of Donegal County Council. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

Hi
Please find attached our response form to Public Consultation for Noise Action Plan for N 56 road. Would it be possible going forward for you to update us on any further developments re same as reduction in traffic noise.adjacent to our home would be very welcome.

Kind regards
[redacted]

[redacted]

Respondent Information Form

Please complete the details below and return it with your response. This will help ensure we handle your response appropriately. Thank you for your help.

Name: [redacted]
Postal Address: [redacted]

1. Are you responding: (please tick one box)
   (a) as an individual ☑ go to Q2a/b and then Q4
   (b) on behalf of a group/organisation ☐ go to Q3 and then Q4

INDIVIDUALS

2a. Do you agree to your response being made available to the public (in the Donegal County Council library and/or on the Donegal County Council website)?

Yes (go to 2b below) ☐
No, not at all ☑ We will treat your response as confidential

2b. Where confidentiality is not requested, we will make your response available to the public on the following basis (please tick **one** of the following boxes)

Yes, make my response, name and address all available ☐
Yes, make my response available, but not my name or address ☐
Yes, make my response and name available, but not my address ☐

ON BEHALF OF GROUPS OR ORGANISATIONS:

3. The name and address of your organisation will be made available to the public (in the Donegal County Council library and/or the Donegal County Council website). Are you also content for your response to be made available?

Yes ☐
No ☐ We will treat your response as confidential

SHARING RESPONSES/FUTURE ENGAGEMENT

4. We will share your response internally with other Donegal County Council policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Donegal County Council to contact you again in the future in relation to this consultation process?

Yes ☑
No ☐

Comhairle Contae Dhún na nGall
Donegal County Council

www.ccdhunnangall.ie www.donegalcoco.ie

Our Ref: O7993

Donegal County Council
Road Design Office
Lifford
Co. Donegal

XXXX XXXXXX
XXXXX,
XXXXXXXXXXX,
Co. Donegal,

07th September 2018

RE: Donegal County Council Draft Noise Action Plan 2018-2023

Dear XXXXXX,

Thank you for your submission regarding the above.

Please find below outline of works to be carried out under the NAP 2018-2023

Noise reduction of existing sources of long term environmental noise, where necessary, will be considered as part of the 5 year plan and within the area covered by the strategic noise mapping. The assessment of relevant actions will use the following approach:

- Review the strategic noise maps to identify priorities through use of decision support matrix (Matrix A & Matrix B)
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- Undertake cost effective actions for which funding is available

Please note that all of the actions above are subject to the availability of funding.

Rob Connolly
Assistant Engineer
Road Design

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Traffic Noise pollution issues on the N15 Bundoran bypass -

Noise action plan 2018-2023 submission

To whom it may concern I would like the following to be taken out on board regarding this and other stretches of road in the county in the 2018-2023 Noise Action Plan.

I have been concerned for a long time about the sound and noise levels/pollution emanating from vehicular traffic at local housing estates along the stretch of road, that is, the N15 Bundoran bypass, part of the longer Bundoran/Ballyshannon bypass.

It is clearly audible on every working day and the volume and intensity of traffic is increasing each year as local residents bear the brunt of it, especially those of us closer to the bypass itself.

The decibel level is increasing as traffic volumes continue to increase.

The traffic models constructed at the time never took into consideration later marketing strategies such as the very successful Wild Atlantic Way and we now see examples of Cornwall in England this summer, where 'Visit Cornwall' are counting the cost of over tourism, something that has probably never being used or considered in any Donegal County Council Road strategy/noise abatement strategy.

The construction of the estate at XXXXXXXXX in Bundoran where I live with a young family was in development stage at the same time as the N15 Bundoran bypass - over 105 houses by final completion.

The sound and road noise pollution went from zero as it was a completely new road to the volumes the road is carrying today with resultant noise levels.

I regularly walked out the Bundoran Ross area before it was constructed and lived in our XXXXXXXXX house in the days before the bypass was opened and the noise levels are much worse than any of us could ever have anticipated.

In the 12 years since it opened in 2006, noise annoyance and decibels have increased.

A later housing development at Ross View continues apace along that same stretch of N15 road. Has investigations taken place as to the noise pollution and indeed other pollutions that affect residents and their children along this particular route which is the major arterial route into south Donegal from Sligo and the West?

And I'm also including additional houses in the Bundoran estates itself off the direct line of houses running parallel with the bypass.

There are also two green areas close to the bypass, that are used by children to play.

Unlike the long standing residents/occupants of housing estates in Ballyshannon at Benildus Avenue and Assaroe View who only got mitigating sound barriers and a particular compound mix on the road, as a result of organised objections to the bypass, the new housing construction at Bundoran was caught unawares and the residents from XXXXXXXXXX had no representation at the original An Bord Pleanala oral hearing into the then proposed bypass development.

It was at a time of rapid economic expansion and checking out noise levels was the least of myriad concerns (protests at the time largely centered on the sale of land from farmers by CPO) unless pushed through legal channels as happened at the ABP Oral hearing into the scheme for some Ballyshannon residents.

At the very least the same sound mitigating measures should have been put in place along part of the Bundoran Town side stretching back towards Tullaghan roundabout from the R280 turn off to Kinlough/Manorhamilton and back in Bundoran via Church Road.

The foliage there at present does not satisfy any noise abatement because of the gradient of the rising road as it passes XXXXXXX in particular.

It should have grown taller and been heavier and denser but again the elevation of the road past the estate would have rendered it less effective than otherwise believed.

There may be a misconception that residents not directly beside the bypass are not been adversely affected by the bypass noise. Prevailing weather conditions also influence the noise levels.

There is no need for a clock alarm on working/school mornings as the volume of traffic and sound is enough to wake families in the estate, even those that are not directly beside the bypass.

It is particularly noisy at work times, morning and evening, during the summer season and bank holidays, North and south.

This is with windows shut and is exacerbated when a window is left open for temperature regulation as per the recent heatwave.

Noise can sometimes be louder from bedroom locations because of the acoustics from the road.

The design of the road, the length of time you can actually hear even a single vehicle from the estate and even my house which is not the first line of housing perpendicular with the bypass is a constant irritant and was never given full consideration - in my opinion - during the initial construction of this part of the bypass because of no engagement or concerns raised from a very new housing estate.

Noise levels were never going to a major issue relating to a non urban area but with Bundoran now the largest population base, north of the Gateway City of Sligo, it is incumbent that appropriate barriers and other sound absorption methods are now installed at critical points.

In the years since road construction the town has also developed a thriving surf destination location.

The road design at Bundoran was not in anyway oriented towards mitigation or abatement when it came to traffic noise concerns for nearby residents along the N15 bypass route at Bundoran in terms of road compounds as happened in Ballyshannon.

There is also an elevation to support a bridge over the R280 Kinlough Road which seems to magnify the sound levels at XXXXXXXXX. Foliage on downward slopes have not worked.

It must also be pointed out that because of the particularly straight stretch that runs from the Tullaghan roundabout for about 1.5 to 2kms known locally as the Drowes roundabout (the village of Tullaghan is actually in County Leitrim, not Donegal) it encourages vehicle speedsters who can be heard late into the night in modified noisy cars zipping up and down that particular stretch of road.

The straight stretch is also a favourite for noisy motorbikes, especially at weekends and breezy Sunday afternoons - outside the normal noise monitoring days!

Again this is due to the long stretch of particularly straight bypass road.

At an adjoining estate beside XXXXXXXXX, Ross View at the point closest to the road, and beside an under bridge walkway to the Ross from Bayview Avenue some trees initially planted to mask the view and which may have provided some noise abatement appear also to have been cut down to facilitate a route for further phase of housing development at Ross View and access for construction vehicles.

I'm not even sure if Donegal County Council were even aware of the issue, but the end result is that less foliage/trees is there now than before, with knock on effects for that particular set of housing adjacent to the Bundoran bypass.

Going back to the design of the original design access off the bypass to Kinlough/Manorhamilton, this access route was again only added after objections by Leitrim County Council to the construction which meant a redesign of that area to facilitate an exit point and entry point from the R280 to satisfy Leitrim objections.

This also exacerbates traffic noise/pollution levels.

The natural amphitheatre noise and reverberation created by a nearby quarry which was still in operation during phases of the construction of the Bundoran bypass and which is on the opposite side of the XXXXXXXXX was also never fully considered in terms of noise elevations during the bypass construction or post construction.

One final observation relates to the condition of the sound barriers on the stretch of the larger Bundoran-Ballyshannon bypass where there is a barrier of 100-150 metres past the Aodh Ruadh Bridge in Ballyshannon.

The barriers have been eroded and heavily vandalised over the years, effectively making their presence a mere eyesore.

In that time, since they were constructed in the earlier years after the Millenium, not a singular attempt has been made to fix them.

They are now horrible looking and never have been maintained in any manner shape or form.

Notwithstanding the aesthetics of the barriers they have become more and more ineffective down the years and they have been abandoned to Mother Nature and wanton vandalism.

If sound barriers are erected, they need to be continually monitored and maintained.

I respectfully ask that you take the above observations into consideration regarding noise issues for residents along the Bundoran part of the N15 bypass at Bundoran and Ballyshannon in the new Noise Action plan 2018-2023.

It is not a technical document and all that has been outlined is in good faith, in the hope that things might improve in terms of noise abatement/pollution and indeed any other EU chemical pollutant concerns at this location.

Thank you.

Sincerely

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

(I do not wish for any of my personal address details or my name to be made public public)

Comhairle Contae
Dhún na nGall
Donegal County Council

www.ccdhunnangall.ie www.donegalcoco.ie

Our Ref: O7995

Donegal County Council
Road Design Office
Lifford
Co. Donegal

XXXXXXX XXXXXX
XXXXXXXXX,
XXXXXXXX,
Co. Donegal,

07th September 2018

RE: Donegal County Council Draft Noise Action Plan 2018-2023

Dear XXXXXXX,

Thank you for your submission regarding the above.

I appreciate your concerns in relation to the NAP, particularly along the section of N15 bypass at Bundoran & Ballyshannon.

Please find below outline of works to be carried out under the NAP 2018-2023.

Noise reduction of existing sources of long term environmental noise, where necessary, will be considered as part of the 5 year plan and within the area covered by the strategic noise mapping. The assessment of relevant actions will use the following approach:

- Review the strategic noise maps to identify priorities through use of decision support matrix (Matrix 'A')
- Confirm the extent of the noise impact through refined noise modeling and/or short term noise monitoring
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Rob Connolly
Assistant Engineer
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