

Dublin Agglomeration

Environmental Noise Action Plan

December 2018 – July 2023

VOLUME 2 | DÚN LAOGHAIRE-RATHDOWN COUNTY COUNCIL



December 2018



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

Volume 1



Comhairle Contae County Council

Volume 2



Comhairle Contae Fhine Gall
Fingal County Council

Volume 3



Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Volume 4



Noise Action Plan December 2018 – July 2023

***Submission to the EPA under the
Environmental Noise Regulations, 2006***

Traffic & Road Safety Section,
Municipal Services Department
Dún Laoghaire Rathdown County Council

**VOLUME 2 DÚN LAOGHAIRE RATHDOWN
COUNTY COUNCIL**

January 2019

Executive Summary

Introduction

The key objective of the Dún Laoghaire-Rathdown County Council (DLRCC) Noise Action Plan 2018-2023 is to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, arising from long term exposure to environmental noise from road traffic and rail. This will be achieved by taking a strategic approach to managing environmental noise and undertaking a balanced approach in the context of sustainable development.

Legal Context

This Noise Action Plan has been prepared in accordance with the requirements of the Environmental Noise Regulations 2006, Statutory Instrument 140 of 2006. These Regulations give effect to the EU Directive 2002/49/EC relating to the assessment and management of environmental noise. This Directive sets out a process for managing environmental noise in a consistent manner across the EU and the Noise Regulations set out the approach to meeting the requirements of the Directive in Ireland.

Description of the Area

DLRCC varies substantially throughout the County from busy town centres to rural landscapes and developing suburban residential developments. It is bounded by the Irish Sea at the east of the County and by the Wicklow mountains in the South West of the County. The area of the County is approximately 127km². The population of the County now stands at 217,274, an increase of 5.3% or 11,013 people from 2011 with population increases occurring across the County.

Noise Mapping

The Regulations set out a requirement for the assessment of environmental noise through the development of strategic noise maps. The strategic noise maps were developed using Predictor noise mapping software. Within the DLRCC administrative area, strategic noise maps were developed for noise emanating from road traffic, rail (DART and heavy rail) and light rail (LUAS) sources. The noise mapping for rail and light rail sources were undertaken by Irish Rail and Transport Infrastructure Ireland (TII) respectively, whilst the noise mapping for road traffic noise was undertaken directly by DLRCC.

Preparation of strategic noise maps is mainly a technical process requiring an array of different input datasets across large geographical areas. The strategic noise mapping process results in grids of calculated noise levels at specified contour intervals and the output from the mapping process allows the determination of the location and magnitude of noise levels within an area using 5dB(A) noise bands. This gives an indication of the number of people and households exposed to different levels of environmental noise. In the interest of consistency with the Round 2 Noise mapping, it was decided to use the adapted version of the UK CRTN methodology for the assessment of road traffic sound levels.

With regard to road traffic noise mapping, approximately 460 km of road was input into the models with 49% being designated as Major Roads i.e. carrying more than 8,220 vehicles per 24 hours. The area modelled was slightly larger than the area mapped as a two kilometre buffer outside the County boundary was included in the noise model in order to take into consideration the influence of traffic outside of the area to be mapped.

Desirable and Undesirable Sound Levels

In line with the previous noise action plan, the following are the target values for desirable low and undesirable high sound levels in the Noise Action Plan 2018-2023:

Desirable Low Sound levels

< 50 dB(A) Lnight

< 55 dB(A) Lday

Undesirable High Sound levels

> 55 dB(A) Lnight

< 70 dB(A) Lday

Also, it is proposed to use the following absolute values as a criterion for defining a Quiet Area:

< 45 dB(A) Lnight

< 55 dB(A) Lday

< 55 dB(A) Lden

During the implementation of the noise action plan, it is proposed to identify locations that have noise levels below these criteria and review their use. If appropriate or necessary, locations will be identified as quiet areas where the existing noise levels are to be preserved or reduced if possible.

Strategic Environmental Assessment (SEA) Screening and Appropriate Assessment Screening

A pre-screening statement carried out on the Noise Action Plan in accordance with EPA guidelines and a checklist indicated that the plan did not require a full SEA. In addition, as the draft Noise Action Plan will have no significant effects on a Nature 2000 site, undertaking an Appropriate Assessment was not deemed necessary.

Summary of Actions

The key actions that will be implemented under the new Noise Action Plan 2018-2023 area listed under the following headings:

- Identify priority action areas;
- Develop Traffic Noise reduction and prevention measures;
- Develop Rail reduction and prevention measures;

- Include Noise in the Planning Process;
- Protecting 'Quiet Areas';
- Expand the existing Sound Monitoring Network; and
- Noise Complaint Investigation.

The Noise Action Plan 2018-2023 will be implemented through a staged process over 5 years, subject to resources being made available. In 2021, December, DLRCC will carry out a review of the actions implemented and policies developed under this action plan. Progress and results will be evaluated using information gathered through local assessment of environmental noise exposure. A review of new noise maps will also be carried out, giving an indication of the change in environmental noise levels and the numbers of people exposed.

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1. Introduction

1.1 Background

This Environmental Noise Action Plan has been developed Dún Laoghaire - Rathdown County Council (DLRCC) in its role as designated Action Planning Authority under Article 7 of the Environmental Noise Regulations 2006, Statutory Instrument Number 140 of 2006 (the Regulations). This will form part of a combined plan for the Dublin Agglomeration that will include plans for the three other Dublin Local Authorities, i.e. Dublin City Council, South Dublin County Council and Fingal County Council.

The Noise Action Plan is aimed at managing environmental noise and excludes noise from domestic activities, noise created by neighbours, noise at workplaces or construction noise as these can be dealt with under existing legislation such as the Environmental Protection Agency Act 1992 and Health & Safety legislation.

The aim of this document is to provide an overview of the regulations, to review the results of the latest strategic noise maps for DLRCC and to set out an approach to the strategic management and control of environmental noise over the next five years. It also provides the basis for feedback and input from the statutory authorities and the public to help inform the Noise Action Plan for DLRCC.

1.2 Sound and Effects of Noise

Noise can be characterised as “unwanted sound” or “sound that is loud, unpleasant or unexpected”, (European Commission Green Paper). Prolonged exposure to noise can lead to serious health effects mediated by the human endocrine system and by the brain, such as sleep disturbance, cardiovascular diseases, annoyance (a feeling of discomfort affecting general well-being), cognitive impairment and mental health problems. It can also cause direct effects such as tinnitus. The effects of exposure to noise impact EU economies. They can lead to a loss of productivity of workers whose health and well-being are affected by noise, put a burden on health care systems and cause a substantial depreciation in real-estate value.

Sound levels are expressed in decibels (dB) on a logarithmic scale, where 0 dB is nominally the “threshold of hearing” and 120 dB 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. Exposure of people to day time noise levels above 65dB(A) can result in health problems (WHO).

Figure 1.1 below provides an overview of common sound levels on the dB(A) scale as outlined in the NRA (now TII) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004. From this, we can see that the sound in a quiet bedroom is about 35 dB(A) and the sound in a busy office is about 60 dB(A).

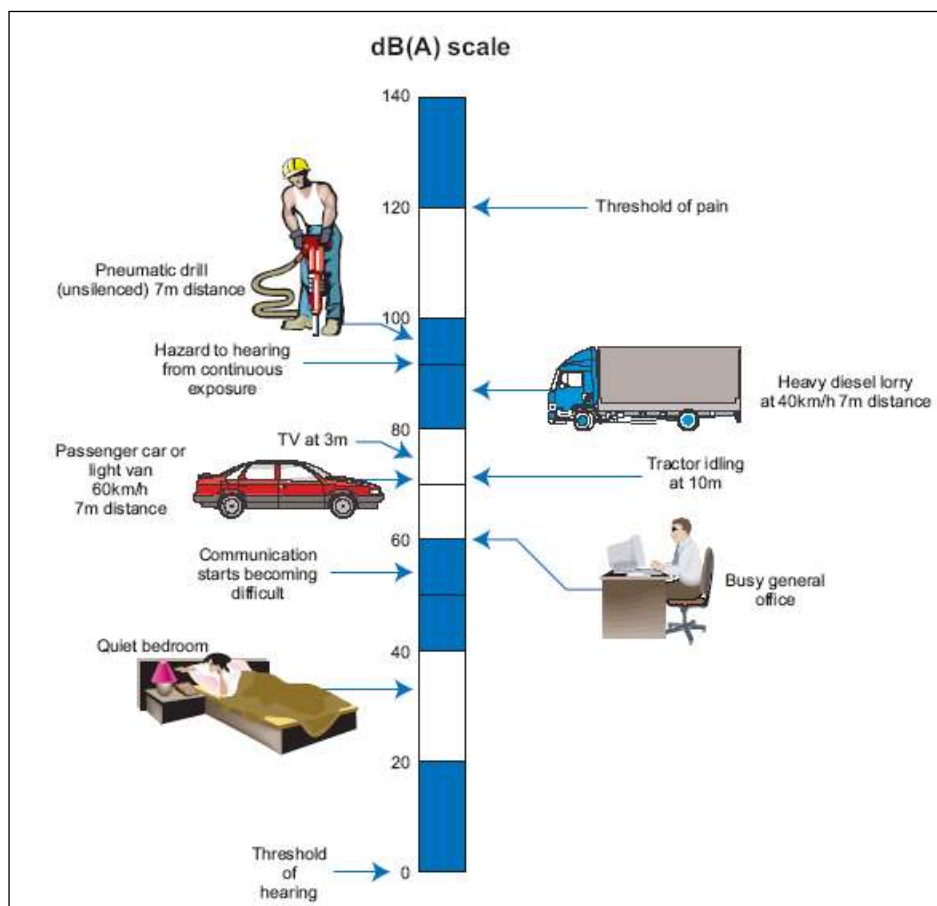


Figure 1.1 Levels of Typical Common Sounds on the dB(A) Scale (NRA, 2004)

Environmental noise, commonly called noise pollution, is among the most frequent sources of complaint regarding environmental issues in Europe, especially in densely populated urban areas and residential areas near highways, railways and airports, (WHO, European office). People are exposed to different sources of noise, including:

- Transport (road traffic, rail traffic, air traffic);
- Construction and industry;
- Community sources (neighbours, radio, TV, bars, restaurants);
- Social and leisure sources (portable music players, fireworks, etc.);
- Indoor noise sources (ventilation systems, office machines, home appliances and neighbours).

Noise disturbance can contribute greatly to diminishing people's quality of life. Unwanted sound (noise) of sufficient intensity and duration can cause temporary and/or permanent hearing loss. It can also interfere with speech communication, the transmission of other auditory signals, can disturb sleep and can act as a general source of annoyance or disturbance and interfere with the performance of complicated tasks and the opportunity for privacy. In general, sound levels in cities can range between 60-70 dB(A), with suburban levels between 50-60 dB(A).

In 2009, the WHO European Regional Office published the '*Night Noise Guidelines for Europe*'. It presented new evidence on the health damage of night time sound exposure and recommended threshold values that, if exceeded at night, would threaten health. An annual average night exposure not exceeding 40 dB(A) outdoors is recommended in the WHO guidelines. It is recommended that this level should be the target for night noise guidelines to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly. A night time level of 55 dB(A) is recommended as an interim target for countries that cannot meet these night noise guidelines in the short term and where policy-makers choose to adopt a stepwise approach.

In 2011 the European Regional Office of the WHO published a document entitled '*Burden of Disease from Environmental Noise*'. It suggests that there is overwhelming evidence that exposure to environmental noise has adverse effects on human health. The publication provides an evidence base for the future development of suitable guidelines on noise. It supports the recommendations as set out in the '*Night Noise Guidelines for Europe*' publication and supports this view based on a review of evidence based assessments of the impact of noise on health.

Noise pollution remains a major environmental health problem in Europe, with the transport sector being a major cause. According to the European Environment Agency (EEA) report titled 'Managing exposure to noise in Europe', Road traffic noise is the dominant source affecting human exposure above the EU's threshold of 55 decibels (dB) for daily exposure and 50 dB for night exposure. Also in the report, it is stated that around 100 million people are exposed to road traffic noise above 55 dB in the 33 member countries of the EEA. Of these, 32 million are exposed to very high noise levels (above 65 dB). Railways are the second largest source, with 19 million people exposed to noise levels above 55 dB. Aircraft noise, close to major airports, is the third main source, with more than 4.1 million people exposed, followed by industrial noise within urban areas, with 1.0 million people exposed.

1.3 Purpose and Scope of the Environmental Noise Directive

In 2004 the European Commission adopted Directive 2002/49/EC, which relates to the assessment and management of environmental noise. This directive is commonly referred to as the Environmental Noise Directive.

The aim of the Environmental Noise Directive is to identify a European Union common approach aimed at avoiding, preventing or reducing the negative and harmful effects due to exposure to environmental noise. In the Directive's provisions, environmental noise is defined as 'unwanted or harmful outdoor sound created by human activity, such as noise emitted by means of transport, road traffic, rail traffic, air traffic and industrial activity'. The Directive indicates a number of actions that need to be progressively implemented by Member States in order to achieve the objectives of the Directive. These actions relate to four main principles:

- **Monitoring of environmental noise** – Member States must develop strategic noise maps, using a common methodology, in order to determine the exposure to environmental noise in priority areas in their territories;
- **Managing environmental noise issues** – On the basis of the developed strategic noise maps, Member States have to adopt noise action plans containing measures designed to address noise issues, including noise prevention / reduction and preserving environmental noise quality where it is good;
- **Public information and consultation** – Strategic noise maps, noise action plans and relevant information about noise exposure, its effects and measures to be considered to address environmental noise issues should be made available to the public or developed in consultation with the public;
- **Development of European Union long-term strategy** – With a view to reducing noise emitted by the major sources (in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment), the EU Member States should cooperate in order to provide a framework for EU policies addressing environmental noise issues.

The Directive applies to environmental noise to which humans are exposed, particularly in industrial or build-up areas, public parks and in other quiet areas in agglomerations and in open country, near schools, hospitals, etc. However, the Directive does not apply to noise caused by the exposed person, noise created by domestic activities or neighbours or noise at workplaces. Member States are obliged to designate competent national authorities responsible for the implementation of the Directive.

The Environmental Noise Directive 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 250,000 persons in 2007, and those with a population of more than 100,000 persons in 2012 and subsequent rounds.

One of the objectives of the Directive is to establish a common approach to assess the exposure to environmental noise throughout the European Union. Article 6.2 empowers the European Commission to establish common assessment methods for the determination of the noise indicators *L_{den}* (day-evening-night equivalent level) and *L_{night}* (night equivalent level). Article 6.2 of the Directive foresaw the development of a harmonised methodological framework for noise assessment and, in 2009, the Commission decided to develop CNOSSOS_EU (Common Noise aSSessment MethOdS) for noise mapping of road traffic, railway traffic, aircraft and industrial noise.

On the 19th May 2015 European Commission Directive (EU) 2015/996 was published. This Directive sets out common data requirements and a common assessment method for determining the values of L_{den} and L_{night} by computation. Member States are required to use these methods from 31 December 2018 onwards. This methodology will be adopted for the 4th Round of Noise Mapping.

1.4 Purpose and Scope of the Noise Regulations

The purpose and scope of the regulations are set out in the statutory instrument S.I. No. 140 of 2006, which transposes EU Directive 2002/49/EC relating to the assessment and management of environmental noise. It states that for the purposes of these Regulations, environmental noise means unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity.

The Regulations set out to deliver the implementation in Ireland of a common approach to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise. This is to be done through a two-stage process. Firstly, noise must be assessed through the preparation of strategic noise maps for areas and infrastructure falling within defined criteria, e.g. large agglomerations, major roads, railways and airports. Secondly, based on the results of the mapping process, the Regulations require the preparation of noise action plans for each area concerned. The fundamental objective of noise action plans is the prevention and reduction of environmental noise.

The Regulations provide for strategic noise maps and noise action plans to be made available to the general public. They also provide for public consultation to take place on the proposed action plans and for the results of public consultation to be taken into account in finalising action plans or in the review of action plans.

1.5 Role and Responsibilities of Designated Bodies

The Regulations designate the EPA as the national authority for the purposes of the Regulations. The role of the Agency includes supervisory, advisory and coordination functions in relation to both noise mapping and action planning, as well as reporting requirements for the purpose of the Directive.

The Regulations designate noise-mapping bodies and action planning authorities for the making of strategic noise maps and action plans. Primary responsibility for both noise mapping and action planning is assigned to local authorities. While a number of other bodies also have noise mapping functions, these bodies will carry out their functions on behalf of the local authorities concerned.

1.5.1 Noise Mapping Bodies

A strategic noise map is defined within the Environmental Noise Directive as a map designed for the global assessment of noise exposure in a given area due to different noise sources for overall predictions for such an area' (EU, 2002).

The roles of the Irish noise mapping bodies are set out in the Environmental Noise Regulations 2006. Table 1.1 outlines the organisations that have been designated as noise-mapping bodies under the regulations:

Table 1.1 Designated Noise Mapping Bodies	
For the agglomeration of Dublin	Dublin City Council and the County Councils of Dún Laoghaire/Rathdown, Fingal and South Dublin
For the agglomeration of Cork	Cork City Council and Cork County Council
For major roads	The Transport Infrastructure Ireland (TII) , for national roads classified in accordance with Section 10 of the Roads Act 1993 (No.14 of 1993), and the relevant road authority, or authorities, for major roads not classified as national roads
For major railways -	Iarnród Éireann (Irish Rail) or the Railway Procurement Agency (now known as TII), as appropriate;
For major airports	The relevant airport authority.

Following the second round of noise mapping in 2012, each designated noise mapping body was required to make a strategic noise map during 2017, for each of the following areas in respect of data from 2016:

- An agglomeration with more than 100,000 inhabitants;
- Any major road with more than 3 million vehicle passages per year (approximately 8,220 per day);
- Any major railway with more than 30,000 train passages per year (approximately 82 per day); and
- Any major airport with more than 50,000 aircraft take-off or landing movements per year (approximately 137 per day).

DLRCC submitted the required Noise Mapping Report to the EPA in January 2018. A key element in the production of maps is that they are sufficiently accurate and detailed to satisfy any public appraisals as public engagement is a central objective of the Environmental Noise Directive.

1.5.2 Noise Action Planning Bodies

Action planning authorities are responsible for the making and approving of Noise Action Plans, in consultation with the EPA and the noise mapping body for the relevant noise map. Under the Regulations, the organisations listed in Table 1.2 have been designated as action planning bodies:

Table 1.2 Designated Noise Action Planning Bodies	
For the agglomeration of Dublin	Dublin City Council and the County Councils of Dún Laoghaire Rathdown, Fingal and South Dublin.
For the agglomeration of Cork	Cork City Council and Cork County Council.
For major railways	The local authority or local authorities within whose functional area or areas the railway is located.
For major roads	The relevant local authority or local authorities within whose functional area or areas the road is located.
For major airports	The local authority or local authorities within whose functional area the airport is located.

Accordingly DLRCC is designated as the Noise Action Planning Authority for all roads (including major roads), major railways, major airports and major industry within its administrative area. DLRCC are also required to contribute to an overall Dublin Agglomeration Noise Action Plan. *Major Roads are defined as roads which experience a volume of traffic greater than 3 million vehicle passages per year.*

DLRCC are required to ensure the following:

- The public are consulted on proposals for noise action plans;
- The public are given early and effective opportunities to participate in the preparation and review of action plans;
- The results of public participation are taken into account in finalising action plans or reviews of action plans;
- The public are informed of the decisions taken in relation to action plans;
- Reasonable time-frames are adopted to allow sufficient time for each stage of public participation.

1.6 Key Phases

The Environmental Noise Directive sets out a process for managing environmental noise in a consistent manner across the EU and the Regulations set out the approach to meeting the requirements of the Directive in Ireland. Responsibility for undertaking the phases of work required under the Regulations is shared between the noise mapping bodies and the action planning authorities.

Noise Action Plans are required to be reviewed and revised every five years. The 3rd Round of mapping for DLRCC was completed in December 2017 and the noise maps can be found on www.dlrcoco.ie under Environmental Noise. The following timetable applies with regard to the Noise Action Plan for the 3rd Round:

- March 2018: Draft Noise Action Plans to be submitted to the EPA for review;
- April to June 2018: Public consultation (6 – 8 weeks) on Draft Noise Action Plan;
- 18 July 2018: Draft Action Plans (including comments) are to be "drawn up" prior to this date;
- December 2018: Action Plans to be submitted to the EPA for final review;
- 18 January 2019: Details of noise control programs and measures to be reported to the EC by the EPA for 3rd round – ENDRM DF9; and
- 18 January 2019: Summary Noise Action Plans to be reported to the EC by the EPA for 3rd round – ENDRM DF10.

Noise Maps for Heavy Rail were completed by Irish Rail and Noise Maps for Luas Light Rail were completed by Transport Infrastructure Ireland.

2. Existing Noise Management Legislation and Guidance

2.1 National and Local Legislation, Regulations and Guidance

In addition to European Commission regulations, there is national legislation and guidance and local policy that relate to the management and control of environmental noise. The following provides an overview of the relevant literature.

2.2 Environmental Protection Agency Act 1992

The existing statutory provisions have primarily come about from the EPA 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 to noise, and can be summarised as follows:

- Section 106 gives the relevant Minister certain powers to regulate noise that may give rise to a nuisance or be harmful to health or property.
- Section 107 gives powers to local authorities and the EPA to serve notice to take steps to control noise from any premises, process or work;
- Section 108 sets out a process whereby noise issues may be taken to the District Court, which may make an order requiring that the person or body responsible for the noise takes steps to eliminate or ameliorate the noise in question.

The powers set out within the EPA Act 1992 largely relate to the control of noise nuisance, and therefore may be applicable to neighbourhood noise, music, industry or other such activities. Arising from the Act, Dún Laoghaire Rathdown County Council has developed policy statements dealing with issues arising from the provisions with the 1992 Act that can be found on the following link:

<http://www.dlrcoco.ie/en/environment/environmental-health/noise-pollution>

2.3 Irish Roads Legislation

In August 2015, Transport Infrastructure Ireland (TII) was established through a merger of the National Roads Authority and the Railway Procurement Agency under the Roads Act 2015. The TII's primary function is to provide an integrated approach to the future development and operation of the national roads network and light rail infrastructure throughout Ireland. TII brings together two organisations to provide high quality transport infrastructure and services, delivering a better quality of life and supporting economic growth.

At present there are no limit values or standards for controlling road traffic noise, or its assessment on either new or existing roads. In the absence of a regulatory assessment method or limit values, the National Road Authority (NTA now known as TII) published the document '*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*' in 2004.

A further good practice guide was issued by the NRA in 2014 titled 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes'. The new Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes is based on the lessons learned from post EIA noise evaluations studies and research undertaken on the design of noise barriers. It provides advice and information for use by acousticians and it is also relevant for traffic, motorway and pavement engineers. The advice supplements the original noise guidelines and it should be read in conjunction with that document.

The guidelines indicate that all new national road schemes should be designed, where feasible' to meet a day-evening-night sound level of 60 dB Lden in the opening year and design years. Essentially what this means is that for any new road scheme the Environmental Impact Statement must take this target into account with regard to any existing sensitive residential property likely to be affected by the road scheme. Further updates are currently being prepared by TII.

2.4 Irish Planning Guidance

Local Authorities can set conditions relating to noise as part of a planning permission. However, there is currently no national policy or guidance that addresses the issue of noise during planning leading to inconsistencies in relation to both the assessment and conditioning of planning applications.

On 16 February 2018, the Government launched *Project Ireland 2040* comprising the National Development Plan 2018-2027 (NDP) and the National Planning Framework (NPF). The former is designed to commit significant Exchequer funding over the next decade to help support the spatial planning objectives of the NPF. Under Chapter 9 of the NPF, Policy Objective 65 relates to noise as follows:

"Promote the pro-active management of noise where it would have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans".

Three Regional Spatial and Economic Strategies are currently being prepared and will include new Metropolitan Area Strategic Plans for the cities of Dublin, Cork, Limerick, Galway and Waterford. These will guide where population increase and economic growth is to be focused.

2.4.1 Planning Design Guidance

The following lists a number of documents relating to sustainable development in the urban environment:

- Design Manual for Urban Road and Streets, April 2013;
- Our Sustainable Future, A Framework for Sustainable Development in Ireland, June 2012;
- 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), February 2008.

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

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

2.5 IPPC Licensing

Certain activities that are required to be licensed may be subject to controls relating to sound emissions. The relevant guidance is set out in the EPA document, ‘*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*’ was originally published in April 2012 and was updated in 2016. This revised Noise Guidance Note (NG4) is intended to assist licensed sites with the assessment of their potential and actual noise impact on the local environment. It recommends a “Best Available Technique” approach to the assessment and mitigation of noise pollution.

2.6 Building Regulations 1997 - 2017

The design and construction of buildings is regulated under the Building Control Acts 1990 to 2017, in order to ensure the safety of people within the built environment. The current Irish Building Regulations call for certain constructions to offer ‘*reasonable resistance*’ to both airborne and impact sound. The Regulations apply to the transmission of sound between adjoining residential dwellings, such as within apartment blocks, or semi-detached properties, they do not relate to the transmission of sound from the outside environment into the living accommodation.

The Department of Housing, Environment, Community and Local Government (DoHECLG) 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.

2.7 Regional or Local Legislation or Guidance

This document is a Noise Action Plan for Environmental Noise generated mainly by road traffic in the County. Currently there is no regional or local legislation relating to noise. However, there are a number of guidance documents that are relevant in the context of noise action planning, including:

2.7.1 Regional Planning Guidelines

The Regional Planning Guidelines for the Greater Dublin Area 2010-2022 set out the planned direction for growth within the Greater Dublin Area up to 2022 by giving regional effect to national planning policy. Within the RPG's it is stated that, 'Planning policies need to consider the added health burden from the effects of air and noise pollution, road traffic accidents, sedentary lifestyles, lack of safe community space or spaces with poor access...'. Reference is also made to noise mitigation in the design of Green infrastructure in the guidelines. Section 2.4 of this Noise Action Plan also makes reference to noise in the Draft National Planning Framework 2040.

2.7.2 Development Plans and Local Area Plans

Transportation, environment and development control policies and objectives that aim to reduce the negative and harmful effects arising from the exposure to environmental noise are contained in the Development Plans and Local Area Plans of each of four Dublin Local Authorities, with details of policies shown on their websites.

During the period of the Noise Plan 2013-2018, DLRCC adopted a County Development Plan covering the period 2016 to 2022. In the development Plan noise was considered in the following sections:

2.2.10.4 Policy ST28: Traffic Noise

It is Council policy to ensure that traffic noise levels are considered as part of new developments along major roads/rail lines in accordance with best practice guidelines.

8.2.9.2 Noise Pollution

The Planning Authority will have regard to the 'Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018' when assessing planning applications along major road and rail transport corridors – the objective being to reduce noise from new sources and to identify and protect and create areas of low sound levels.

2.7.3 Transportation Policy for the Greater Dublin Area

There are on-going sustainability policies being implemented at a regional and local level that aim to increase the mode share of sustainable travel modes in the Dublin region with a resultant reduction in noise and air pollution levels arising from less car traffic on the roads: These are as follows:

- **Transport strategy for the Greater Dublin Area, 2016 to 2035.**

This transport strategy provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities. Little reference is made on noise in this document.

- **Smarter Travel – A Sustainable Transport Future 2009-2020**

This sets out a broad vision for the future and establishes objectives and targets for transportation. It also supports greater integration between spatial planning and transport policy and sets a target to reduce car based commuting from 65% to 45% by 2020. No reference is made to noise in this document.

- **National Cycle Policy Framework 2009-2020**

This sets out actions to deliver a new culture of cycling in Ireland by 2020, with 10% of all trips to work being made by bicycle by 2020.

- **National Protocol for Dealing with Noise Complaints for Local Authorities**

The purpose of this Guidance Document is to provide a structured, consistent process for Local Authorities to follow when they are engaging with complaints of noise pollution. The aim is that the process described will be a model of best practice for Local Authorities in this often difficult area of complaint management.

3. Description of the Action Planning Area

3.1 Introduction

Under the Environmental Noise Regulations 2006, the four Local Authorities within the 'Agglomeration of Dublin' are designated as the noise-mapping and action planning bodies for the purpose of making and approving strategic noise maps and action plans. They have been designated as the action planning authorities for the following categories within their areas:

- All Roads and Major Roads;
- All Rail and Major Rail;
- Major Industrial Processes; and
- All Airports and Major Airport.

Before producing and implementing the Noise Action Plan, the Local Authorities must consult with the EPA and the noise-mapping body for the noise-map involved, i.e. Transport Infrastructure Ireland, Iarnród Éireann, and Dublin Airport Authority. Local Authorities are also responsible for consulting with members of the public and are required under the Directive to demonstrate how they have done so.

3.2 Description of Topography

DLRCC varies substantially throughout the County from busy town centres to rural landscapes and developing suburban residential developments. It is bounded by the Irish Sea at the east of the County and by the Wicklow mountains in the South West of the County. The area of the County is approximately 127km². The population of the County now stands at 217,274, an increase of 5.3% or 11,013 people from 2011 with population increases occurring across the County.

3.3 Extent of Action Planning Area

Figure 3.1 shows a map of Dún Laoghaire Rathdown County Council. Based on the 2016 Census data, the population of the County now stands at 217,274, an increase of 5.3% or 11,013 people from 2011 with population increases occurring across the County. The housing stock also rose during this period to approximately 87,700 dwellings in 2016.



Figure 3.1 Map of Dún Laoghaire Rathdown County Council

The entire County was mapped in Round 3 including the area in the First Schedule of the Air Pollution Act 1987 (Marketing, Sale and Distribution of Fuels) Regulations 1998 (S.I. No. 118 of 1998) as follows:

1. The District Electoral Division of Tibbradden,
2. That parts of the District Electoral division of Glencullen situated west of an imaginary line drawn as follows: Commencing at the junction of Slate Cabin Lane and Woodside Road, thence in a south-easterly direction and proceeding along Woodside Road and Ballyedmonduff Road to the county boundary at Glencullen Bridge.

3.3.1 Roads

Approximately 460km of road was input into the noise calculation models with 49% being designated as Major Roads i.e. carrying more than 8,220 vehicles per 24 hours. The area modelled was slightly larger than the area mapped as a two kilometre buffer outside the County boundary was included in the model in order to take into consideration the influence of traffic outside of the area to be mapped in the County.

3.3.1.1 Traffic

In recent years there have been significant changes in vehicle ownership and traffic flows on roads as economic activity and employment levels have been growing. Table 3.1 outlines the changes in numbers of licensed vehicles from 2010 to 2017.

Table 3.1 Number of licensed Vehicles in Dublin and Nationally			
Year	Dublin City and County	Goods Vehicles Dublin	Nationally
2010	595,322	59,512	2,416,387
2011	595,033	58,215	2,425,156
2012	592,841	56,570	2,403,223
2013	596,418	57,203	2,482,557
2014	605,546	57,766	2,515,322
2015	620,469	61,724	2,570,294
2016	637,297	66,621	2,624,958
2017	647,325	69,724	2,675,879
2010 to 2017 – diff	52,003	10,212	259,492
2010 to 2017 - %	8.7%	17.2%	10.7%
2014 to 2017 - %	6.9%	20.7%	4.4%
Source: Irish Bulletin of Vehicle and Driver statistics 2010 to 2017, DoEHLG / DTTaS			

From Table 3.1, we can see that over the period 2010 to 2016, there has been an increasing trend in the number of licensed vehicles in Dublin City and County and nationally with a higher increase in Goods Vehicles in the Dublin area.

Table 3.2 outlines the trend in traffic flows on the main national roads in the County over the period 2014 to 2017. We can see that there has been a significant increase in traffic volumes on the M50.

Table 3.2 Traffic Flows on dlr National Roads 2014 to 2017					
TII Traffic Flows AADT	2017	2016	2015	2014	2014 to 2017%
M50 Sandyford J13-J14	74345	72379	69023	65265	13.9%
M50 Ballyogan J14-J15	72399	70745	68095	65103	11.2%
M50 Carrickmines J15-J16	69113	67851	64993	61973	11.5%
Mount Merrion Avenue N31	10608	12064	11905	11957	-11.3%
Brewery Road N31	16038	15530	15824	16018	0.1%
Source: www.nrtrafficdata.ie					

In August 2017, the Central Statistics Office (CSO) published Census 2016 *Profile 6 Commuting in Ireland*. The report shows that in April 2016 the number of people nationally travelling to work, school or college stood at 2,962,550, an increase of 9.3% on the 2011 figure.

Table 3.3 outlines the trend in travel mode share in DLRCC for those travelling to work, school or college. From this we see that there has been an increase in the percentage of people using sustainable travel modes to travel to work or education.

Table 3.3 DLRCC Travel Mode Share 2011 and 2016			
Means of Travel	2016%	2011%	Increase
On foot	14.1%	14.1%	0%
Bicycle	6.6%	5.3%	26%
Bus, minibus or coach	11.2%	10.6%	5%
Train, DART or LUAS	13.9%	11.9%	17%
Motorcycle or scooter	0.6%	0.7%	-12%
Car driver	36.6%	37.9%	-3%
Car passenger	15.2%	15.0%	1%
Van	1.7%	1.7%	-1%
Other (incl. lorry)	0.1%	2.9%	-95%
Total excl. 'working at home' and 'not stated'	100.0%	100.0%	
Source: CSO Census 2011 & 2016 - Trips to work, school and college			

3.3.2 Rail

Ireland has a network of rail lines that have been in place for almost 150 years over which a significant number of public transport rail services are provided. The network supports the economic and social development of the state in providing accessible transport to many key destinations. There are two rail lines running through DLRCC, the Dart and Heavy Rail Line and the Green Luas line.

3.3.2.1 Dart Line

The length of track through the County is 20.14km with the length of network within Dublin comprising 111.3km. The track within the entirety of DLRCC is electrified twin track. The County is served by 72 DARTs per direction per day and 8 Intercity Dublin to Rosslare services as seen in the NTA National Heavy Rail Census report 2016.

Nationally, the number of Irish Rail passengers has increased in recent years as follows:

- 36.7 million journeys in 2013;
- 37.8m in 2014;
- 39.7m in 2015;
- 42.8m in 2016; and
- 45.5m in 2017.

DART passenger numbers have increased from:

- 15.9 million journeys in 2013;
- 16.3m in 2014;
- 17.1m in 2015;
- 19.0m in 2016; and
- 20.1m in 2017.

3.3.2.2 Luas

The length of Green Line from Brides Glen to St. Stephens Green is approximately 16.5km. Within DLRCC's administrative boundary there are 16 stops commencing at Brides Glen Stop and ending at Windy Arbour Stop. The length of this section is approximately 12.5km.

The Luas Cross City extended the Luas Green Line from St. Stephens Green to Broombridge and commenced operations in December 2017. Therefore, Luas Cross City was not mapped as part of Phase III strategic noise mapping as the Environmental Noise Regulations required the mapping of Major Railways for 2016.

Passenger numbers on the Luas have been increasing in recent years as follows:

- 32.4 million passengers were carried in 2014;
- 34.6 million passengers were carried in 2015; and
- 34.2 million passengers were carried in 2016.

4. Responsible Authority for Action Planning

4.1 Name and contact details for the Responsible Authority

Dublin City Council and the County Councils of Dún Laoghaire-Rathdown, Fingal and South Dublin are the designated Action Planning Authorities under the noise regulations and are responsible for the preparation and implementation of the Noise Action Plan for the Dublin Agglomeration. This plan has been prepared by DLRCC with support, assistance and information supplied by the EPA and neighbouring County Councils.

The address in DLRCC in relation to strategic noise mapping and action planning is as follows:

*Dún Laoghaire – Rathdown County Council – County Hall, Municipal Services Department,
Marine Road, Dún Laoghaire, Co. Dublin.*

The address for each Local Authority in relation to strategic noise mapping and action planning in the Dublin Agglomeration is as follows:

1. Dublin City Council – The Traffic Noise & Air Quality Unit, Block 2, Floor 4, Civic Offices, Wood Quay, Dublin 8.
2. Fingal County Council – Environmental Health Section, Grove Road, Blanchardstown, Dublin 15.
3. South Dublin County Council – Environmental Health Section, County Hall, Tallaght, Dublin 24.

4.2 Description of existing noise reduction measures

4.2.1 Noise Limit Values

There are no specific noise limit values currently in place within each Local Authority except for those in the guidelines outlined in Chapter 2. In general, Local Authorities can only specify advisory levels.

4.3 Review of Dublin Agglomeration Noise Plan 2013-2018

A number of measures were proposed in Chapter 9 of the Dublin Agglomeration Noise Action Plan 2013 to 2018 to prevent noise and reduce, avoid or relocate the various types of noise source under the following headings;

- 9.2.1 Traffic noise reduction and prevention measures;
- 9.2.2 Rail noise reduction and prevention measures;
- 9.2.3 Noise in the Planning Process;
- 9.2.4 Sound Monitoring Network;
- 9.2.5 Protecting 'Quiet Areas'; and
- 9.2.6 Noise Complaint Investigation and Control procedures.

The following sections provide a review of what was Actions were carried out as part of the Plan.

4.3.1 Traffic noise reduction and prevention measures

A number of measures were outlined in the Noise Action Plan to support the use of sustainable travel modes for daily travel. The following measures were carried out in DLRCC over the past 5 years under each action:

- a. Development of Sustainable travel (walking and cycling) infrastructure - A number of schemes were completed in the past 5 years, namely:
 - Pottery Road Improvement scheme.
 - Frascati Road / Temple Hill Improvement scheme.
 - N11 Johnstown Road junction improvement scheme.
 - Leopardstown Road junction improvement scheme.
 - Wyattville Road Pedestrian and cycle scheme.
 - Monkstown Village improvement scheme.
 - The Metals Public Realm Scheme.
 - Commons Road Improvement scheme.
- b. Continued promotion and development of sustainable travel modes in conjunction with transport providers and local communities.
 - DLRCC works closely with the National Transport Authority to develop cycling infrastructure and safety schemes, as listed above.
 - Sustainable travel is a key consideration in all major planning applications, Part 8's and Local Area Plans. It was also considered as part of mixed-use development areas such as the Cherrywood SDZ and the Sandyford Urban Framework Plan.
 - Website www.dlrcoco.ie was updated to include details of cycling related activity and cycling information.
 - A series of cycling activities were held during National Bike Week each year over the past 5 years.
 - A pilot Stationless bike share scheme was established in the County in conjunction with Bleeperbike (www.bleeperbike.ie).
- c. Introduction of Local Transport Plans - No National Guidance has been developed on Local Transport Plans. However, transport planning has been a key element of two main development areas in the County; the Cherrywood SDZ and the Sandyford Urban Framework Plan.
- d. Supported the introduction of Electric Vehicle charge points

- DLRCC worked with ESB as part of the National Programme to roll out EV charge points in Dún Laoghaire, Blackrock, Stillorgan, Dundrum
 - Residential and non-residential development is required to make provision for Electric Charging through the planning process as per Section 8.2.4.12 of the County Development Plan.
- e. Facilitated the introduction of car share clubs – A pilot car club was set up in the County in conjunction with Gocar (www.gocar.ie). Bye-laws are currently being prepared to regulate the use of car clubs in the County.
- f. Adoption of best practice / guideline documents and policy in Transportation Planning – Application of DMURS and National Cycling Manual principles was a key element in the design of all infrastructure schemes in the County.
- g. Reduction in excessive driving speeds in the County - A 30km/h Speed limit has been introduced on 742 roads in housing estates and residential areas in line with the mandatory 'Guidelines for Setting and Managing Speed Limits in Ireland' issued by the Department of Transport, Tourism and Sport (March 2015). Noise was not raised as an issue during the public consultation process.
- h. Promotion of the use of low-noise road surfaces where appropriate - Stone Mastic Asphalt is provided on roads with speed limits less than 60kph and this has been found to have a significant reduction (about 3 dB(A)) in type /road interface noise levels when compared to dense grader asphalts.
- i. Use Roadside Noise Barriers for new road construction projects - No major new road construction schemes have been completed in the past 5 years.
- j. Review of key national roads with TII where noise issues have been identified arising from the noise mapping – No review was undertaken due to a lack of resources. However discussions were held with Transport Infrastructure Ireland on a number of noise issues along the N11 and M50 but no measures have been implemented along these strategic routes.

4.3.2 Rail noise reduction and prevention measures

As part of the previous Dublin Agglomeration Noise Action Plan 2008 to 2013, Iarnród Éireann and the TII (Luas Light Rail) were required to undertake the following actions in relation to noise:

- To produce a sound impact assessment and apply mitigation measures where appropriate, for any new rail infrastructure or ancillary developments or any major intensification on any existing rail infrastructure or ancillary developments within the Dublin Agglomeration.

This assessment should not alone include railway sound emissions but also a sound impact assessment, for example, of traffic, where the new infrastructure or intensification is likely to increase, disrupt or displace traffic flows within the Dublin Agglomeration.

No new rail infrastructure or ancillary developments or any major intensification on any existing rail infrastructure occurred in the County during the period of the plan and thus no sound impact assessment was carried out.

4.3.3 Noise in the Planning Process

As part of the previous Dublin Agglomeration Noise Action Plan 2008 to 2013, the following measures relating to planning and development were implemented.

4.3.3.1 County Development Plan

During the period of the Noise Plan 2013-2018, DLRCC adopted a County Development Plan covering the period 2016 to 2022. In the development Plan noise was considered in the following sections:

2.2.10.4 Policy ST28: Traffic Noise

It is Council policy to ensure that traffic noise levels are considered as part of new developments along major roads/rail lines in accordance with best practice guidelines.

Along major transport corridors, the effect of traffic noise on the development must be considered and appropriate measures undertaken to mitigate the effect of noise. This should be considered in the context of the 'Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018'.

In the planning and design of National Road schemes, cognisance must be given to the National Road Authority document 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (2004) and to the subsequent supplementary good practice guidance document titled, 'Treatment of Noise during the Planning of National Road Schemes'.

Transportation, environment and development control policies and objectives that aim to reduce the negative and harmful effects due to exposure to environmental noise are contained in each of the Development Plans. Also, it is policy in each Council to reduce the number of people exposed to noise.

8.2.9.2 Noise Pollution

The Planning Authority will have regard to the 'Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018' when assessing planning applications along major road and rail transport corridors – the objective being to reduce noise from new sources and to identify and protect and create areas of low sound levels.

Acceptable noise levels are subjective and perception varies from person to person. Taking these factors into account through design and practice can reduce the impacts of noise and improve amenity. Good design should minimise noise intrusion and nuisance to all nearby buildings that are occupied. Residential development should be set back from roads/rail lines such that amenities of residents are not unduly impacted upon by reason of noise. Mitigation measures should be undertaken, where appropriate, between the residential development and road/rail line. Similar mitigation measures may also be required when dealing with commercial development in close proximity to residential areas where there may be noise generated from the completed development – such developments will be assessed on a case by cases basis.

The Planning Authority will use the Development Management process for larger developments:

- To require developers to produce a Sound Impact Assessment, and Mitigation Plan where deemed necessary, for any new development that the Planning Authority considers will impact negatively on pre-existing environmental sound levels.*
- To ensure that future developments are designed and constructed in such a way as to minimise noise disturbances.*
- Placing screens (fences, hedges, mounds) between the noise source and residential units.*
- Locating bedrooms as far away from noise sources as possible without compromising passive design principles. Locating windows away from noise sources if possible.*
- Avoid hard exterior surfaces such as concrete paving that reflect sound rather than absorbing it. Locating noise sources away from property boundaries and noise sensitive areas. To incorporate 'Shared Spaces'/'Home Zones'/or 'Streets for People' in new developments, which recognize that residential streets have multifunction uses for pedestrians, cyclists and vehicles - in that priority order. The noise maps will be used to identify and classify the priority areas and streets.*
- To reduce/avoid traffic by decentralising amenities into local areas. To interposing less sensitive uses between noise sources and sensitive uses.*
- Where noise barriers are provided at the boundaries of large developments, access routes must be provided to allow for the ongoing maintenance of barriers.*

4.3.3.2 Noise as part of Large Development

As part of the Development Management process, noise is considered as part of most major developments. In the Cherrywood SDZ, the following objective was inserted into the Framework:

Objective PD33: *It is an objective to require all development proposals to undertake a detailed noise impact assessment, including noise survey, prior to the lodgement of any*

planning application. The noise survey shall be carried out in general accordance with International Standards Organisation (ISO) 1996: 2007: Acoustics – Assessment, Description and Measurement of Environmental Noise. In residential plots, this survey shall be undertaken for a period of not less than two weeks, and in non-residential areas it shall be undertaken for a period of not less than 1 day. The noise impact assessment shall include an assessment of the survey findings, and recommendations on mitigation and control measures to protect amenity. The noise impact assessment shall be lodged with the relevant planning application.

4.3.4 Sound Monitoring Network

DLRCC installed five units in 2010 in areas considered to be sites of public amenity or potentially noisy locations. The locations are as follow;

- People's Park, Dún Laoghaire;
- Stillorgan Library;
- Dundrum Library;
- Marlay Park, Ballinteer; and
- Cherrywood Technology Park, Loughlinstown.

The units are designed to operate continuously, recording sound levels and statistical information to allow analysis of trends in noise emissions and the entire network has been upgraded to include Global System for Mobile (GSM) communications capabilities.

During the period Dublin Noise Action Plan 2013 to 2018, the network was extended to include the following sites:

- Shankill Library
- Loughlinstown – near dlr Leisure Services

In addition, a website was developed for Dún Laoghaire-Rathdown County Council, Fingal County Council and South Dublin County Council, as follows, that shows the locations of the permanent sound level monitoring stations in the Dublin County Region. The website records the sound levels in each monitor and provides statistical information to allow analysis of trends in noise emissions.

<http://dublin-noise.sonitussystems.com/locations.php>

4.3.5 Protecting 'Quiet Areas'

As part of the Dublin Agglomeration Noise Action Plan 2008 to 2013, an action was included to identify Quiet Areas and preparation of submissions for approval by the Minister for the Environment, Community and Local Government for delimiting as Quiet Areas. Due to funding and resource constraints, no quiet areas were identified.

4.3.6 Prioritising locations

As part of the Dublin Agglomeration Noise Action Plan 2013 to 2018, a prioritisation exercise based on the results of the strategic noise mapping and the decision support matrix was to be carried out and an ordered shortlist of areas drawn up for further exemption with a view to either reducing excessive sound levels or to preserve low sound levels where they exist. Due to funding and resource constraints, this process was not carried out.

5. Summary of the Results of the Noise Mapping 2017

5.1 Introduction

Under EU Directive 2002/49/EC relating to The Assessment and Management of Environmental Noise, the four local authorities, within the agglomeration of Dublin, are required to review and revise, if necessary, 'Strategic Noise Maps' every 5 years. The first sets of maps were produced in June 2007 and second in June 2012. A report was presented to the EPA in October 2016 reviewing changes between Round 2 and Round 3 in DLRCC in relation to the population, traffic volumes, significant infrastructure schemes, large developments and noise emissions from industrial sites and the following summarises the findings.

- Based on the 2016 Census data, the population of the County increased by 5.3% since 2011;
- Traffic volumes increased by about 2% on the 30 main roads used in Round 2;
- Only one new road link has been constructed since 2011, i.e. the Burton Hall Link Road (0.2km);
- A limited number of major developments have been built;
- Emissions from these IPPC licenced industrial sites fall below the reporting thresholds for strategic noise mapping.

A decision was made by DLRCC to proceed with a revision of the strategic noise maps in order to take advantage of significant improvements in data available since Round 2 and advancements in calculation methods. The improved data and calculation methods included the following:

- Improved roads network and traffic data for the majority of the County;
- Improved building height data;
- Improved terrain model data- 1m contours for Round 3, 10m contours for Round 2;
- Revised Census Data;
- Revised Calculation Methods - i.e. from calculated grid points (excluding buildings);
- Resolution of census data – Small Area Population Statistics (SAPS) for Round 3, Electoral Division (ED) for Round 2.

5.2 Noise Map Preparation

Preparation of strategic noise maps is mainly a technical process requiring an array of different input datasets across large geographical areas. The strategic noise mapping process results in grids of calculated noise levels at specified contour intervals and the output from the mapping process allows the determination of the location and magnitude of noise levels within an area using 5dB(A) noise bands. This gives an indication of the number of people and households exposed to different levels of environmental noise.

Preparation of strategic noise maps was carried out by Dún Laoghaire Rathdown County Council with Dublin City Council assisting with running the noise model and the EPA assisting with the population and household exposure assessment and the collation of the maps and tables of statistics. Indicative maps for DLRCC can be seen in Appendix E.

5.3 Sound Calculation method

5.3.1 Method of Assessment

The Environmental Noise Regulations prescribes two methods that can be used for the assessment of noise from road sources. These are CRTN (Calculation of Road Traffic Noise) and the 'Interim Method' as described in the Environmental Noise Directive.

In the interest of consistency with the Round 2 Noise mapping, it was decided to use the adapted version of the UK CRTN methodology for the assessment of road traffic sound levels. Within this assessment procedure, Method 3 was used for conversion of 18Hr AADT to L_{den} and L_{night} .

5.3.2 Dataset Specification

Noise mapping entails the calculation or measurement of sound levels at a number of receiver/receptor points. These values are then used to draw colour contour 'noise maps', which visually represent the levels of 'noise' throughout the area being mapped. In general, the calculation of sound levels takes place in two stages within the 'noise mapping' software:

- 1) The assessment of the level of sound emitted from a source - the "source noise emission";
- 2) The assessment of the attenuation of the emitted sound en-route from the point of emission to the receptor - the "propagation attenuation".

After the assessment of sound levels across the area of the strategic noise mapping is performed, it is then necessary to undertake statistical analysis to determine the area, dwelling and population exposure data required to be reported to the EC. Following this concept, the input dataset required can be classified into:

- Source input data which defines the position and characteristics of the noise sources;
- 3D model pathway input data which defines the environment within which propagation occurs;
- Population input data which defines the location of the population exposed to the long term environmental noise sources.

5.3.3 Noise Model Data Sources

Noise maps are developed by inputting data into 'noise mapping' software. The information required for the source emission model for the road traffic is specific to each method of assessment. The following input information is required for each road section for an assessment of road noise using the adapted UK CRTN method:

- Road centrelines and Traffic Data (Traffic volume, %HGV's, and mean vehicle speed, direction of vehicle flow, road width, road surface type, texture depth, road gradient and road classification;
- Ground region and surface contours;
- Barriers/Screening – Heights and locations; and
- Buildings – Heights and locations.

The model infrastructure data sets for Buildings, Road Centre lines, Contours and Green areas were supplied by OSI under license and dated 2010. Traffic counts were based on an annual average daily traffic for 2017 and the percentage of heavy goods (HGV) vehicles was estimated for those roads that did not have manual HGV counts. Loop detector data from the SCATS traffic control system was used to produce annual hourly traffic volumes, where it was available.

5.4 Noise Exposure Data Sources

The Noise Directive requires information on the total number of dwellings exposed to noise from all roads and major roads with the agglomeration. It also requires information on the estimated number of people living in dwellings that are exposed to noise for the various scenarios mapped:-

The type of information used for the agglomeration of Dublin was:-

- GeoDirectory 'Buildings' table; 'Address Point' Table;
- CSO 2016 Census Data – Small Area Population Statistics (SAPS)
- Geo referenced SAPS object layer attributed with CSO data to Ordnance Survey Ireland (OSI)
-

The Environmental Noise Directive requires that data should not be more than 3 years old. All data sets used in the model were less than a year old with the most up-to-date data set being the 'Geodirectory' containing address point and building use information.

5.5 Noise Level Calculations

The Predictor / Lima software suite, version 11.2 was used in the processing of the noise maps. The default settings for CRTN were used for computation, except for the setting of the fetching radius, which was set to 2000m. The grid spacing's were set to 10m spacing's. The models were subdivided automatically (tiled) into 1km² grids with 2km buffers to improve calculation efficiency. This resulted in each model being 25km² in size. For the area near the boundaries of each local authority, a buffer region of 2Km was used. These smaller models were then recombined automatically on export into the GIS environment.

5.6 Noise levels Indicators and exposure levels

To provide a standardised approach to the description of long term environmental noise, Article 6.2 of the Directive specifies the use of two noise level indicators when preparing environmental noise maps and action plans, namely Lden and Lnight. The Lden 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. Lnight is typically used to assess sleep disturbance.

- Lnight is the A-weighted long-term average sound level between 23.00 and 07.00
- Lden is the 24 hour noise rating level determined by the averaging of the Lday with the Levening plus a 5 dB penalty, and the Lnight plus a 10 dB penalty

The long term, annual average, day, evening and night values are determined and then combined to provide the indicated Lden yearly average, with the definitions shown in Appendix A. The penalties are applied to the evening and night time periods during the assessment of Lden 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.

There are currently no national criteria in relation to noise limit values. In 2009, the EPA issued guidance notes on the development of noise action plans with updates provided in 2011 and 2018. The guidance on sound values where and action should be invoked, are in terms of average night time and 24hour values. The EPA guidance suggests a desirable night time level of 45dB (A) whereas the existing Dublin Agglomeration Noise Action Plan sets it at 50dB (A).

In 2009, the World Health Organisation's European Office published guidance in relation to night time sound levels (Night Noise Guidelines for Europe). In this it stated that, 'considering the scientific evidence on the thresholds of night noise exposure indicated by Lnight, outside, as defined in the Environmental Noise Directive (2002/49/EC), an Lnight, outside of 40 dB should be the target of the night noise guideline (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly.

Lnight, outside value of 55 dB is recommended as an interim target for the countries where the Night Noise Guideline cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach'. For this reason, it is proposed to use an Lnight desirable level of 50dB (A) and undesirable level of 55dB (A) for the new Noise Plan that are in line with the recommended interim target. In addition, daytime noise levels greater than 70 dB are considered to be undesirable.

5.7 Summary of Noise exposure levels

5.7.1 Noise exposure levels – DLRCC

Tables 5.1 and 5.2 set out the population exposure to sound from traffic sources on national, regional and local primary roads in the Dún Laoghaire - Rathdown County Council Area. For the purpose of the Noise Action Plan, targets are set out as to what sound emissions are desirable and undesirable. These targets indicate that a night time level greater than 55 decibels and a daytime level greater than 70 decibels is undesirable. It should be noted that rounding up or down to the nearest '100' is a requirement of the Environmental Noise Directive and the 'error' is not considered significant.

Table 5.1 Lden Noise exposure levels from national, regional and local primary roads 2017			
Decibels dB(A)	Lden number people Exposed	Lden % people Exposed 2017	Lden % people Exposed 2012
< 55	137,600	63%	32%
55-59	33,300	15%	31%
60-64	22,500	10%	14%
65-69	19,200	9%	11%
70-74	4,300	2%	10%
>75	1,100	1%	2%
	218,000		

Table 5.2 Lnight Noise exposure levels from national, regional, local primary roads 2017			
Decibels dB(A)	Lnight number people Exposed	Lnight % people Exposed 2017	Lnight % people Exposed 2012
< 50	157,000	72%	50%
50-55	28,400	13%	20%
55-59	23,700	11%	12%
60-64	5,700	3%	11%
65-69	2,100	1%	5%
> 70	300	0%	1%
	218,000		

The following can be observed from Tables 5.1 and 5.2;

- Of the 218,000 people living in the DLRCC area in 2017, 37% of people are exposed to noise levels greater than 55 dB(A) Lden, reducing from 68% in 2012.
- The percentage of people exposed to the desirable night time noise levels has been found to be 72% in 2017, which represents an improvement from less 50% in 2012.
- The number of people exposed to the undesirable night time levels above 55 dB(A) has reduced from 29% in 2012 to 15% in 2017 with low numbers exposed to night time sound levels above 70 dB(A), i.e. 300 people.

There are a number of factors that may have contributed towards these reductions including the use of amended calculation methods in the noise model.

5.7.2 Noise exposure levels – Luas

Tables 5.3 and 5.4 provide details of the population exposures to sound from the Luas in the DLRCC Area.

Table 5.3 Lden Noise exposure levels from Major Rail in DLRCC – Luas (TII)			
Decibels dB(A)	Lden number people Exposed	Lden % people Exposed 2017	Lden % people Exposed 2012
<50	213600	98%	98%
50-54	1300	1%	1%
55-59	2000	1%	1%
60-64	200	0%	0%
65-69	900	0%	0%
>70	0	0%	0%
	218,000	100.0%	100%

Table 5.4 Lnight Noise exposure levels from Major Rail in DLRCC– Luas (TII)			
Decibels dB(A)	Lnight number people Exposed	Lnight % people Exposed 2017	Lnight % people Exposed 2012
< 50	215500	99%	99%
50-55	1500	1%	1%
55-59	1000	0%	0%
60-64	0	0%	0%
65-69	0	0%	0%
>70	0	0%	0%
	218000	100.0%	0%

From Table 5.3 and Table 5.4, we can see that the noise exposure levels from the Luas in the DLRCC area are low. In Table 5.4, we can see that the number of people exposed to the undesirable night time levels above 55 dB(A) from the Luas is 1000, i.e. less than 0.5% of the DLRCC population.

5.7.3 Noise exposure levels – All Heavy Rail

Tables 5.5 and 5.6 provide details of the population exposures to sound from the Heavy Rail (Dart and Mainline Rail) in the DLRCC Area

Table 5.5 Lden Noise exposure levels from Major Rail in DLRCC – Heavy Rail*			
Decibels dB(A)	Lden number people Exposed	Lden % people Exposed 2017	Lden % people Exposed 2012
<50	216,200	98%	99%
50-54	12,900	1%	1%
55-59	80,00	1%	0%
60-64	6,400	0%	0%
65-69	1,300	0%	0%
70-74	100	0%	0%
>75	0	0%	0%
* See the full Table in Appendix E			

From Table 5.5 and Table 5.6, we can see that the noise exposure levels from the Heavy Rail in the DLRCC area are low. In Table 5.6, we can see that the number of people exposed to the undesirable night time levels above 55 dB(A) from the Heavy Rail is 800, i.e. less than 0.4% of the I population in the County.

Table 5.6 Lnight Noise exposure levels from Major Rail in DLRCC – Heavy Rail			
Decibels dB(A)	Lnight number people Exposed	Lnight % people Exposed 2017	Lnight % people Exposed 2012
< 50	217,800	98%	99%
50-55	1000	1%	1%
55-59	600	0%	0%
60-64	200	0%	0%
65-69	0	0%	0%
70-74	0	0.0%	0%
> 75	0	0.0%	0%
* See the full Table in Appendix E			

6. Noise Management Areas Identification

6.1 Introduction

Low environmental sound levels contribute significantly to the good health and quality of life for the population in the DLRCC. Co-ordinated and sustained effort is required to protect those areas that have low environmental sound levels and to improve areas that are deemed to have undesirable high levels. It can be more cost effective to adopt an approach of prevention through good management and planning rather than having to retrofit existing situations to try and improve the quality of life for citizens. The use and enjoyment of many natural resources, such as our green spaces and sea frontage can be further enhanced through the preservation of low sound levels or the reduction in undesirably high levels, thus providing respite from the noisy 'hustle and bustle' often experienced in the busy urban environment.

6.2 Confirmation of onset of Assessment Thresholds

The results of the strategic noise maps provide an indication of the extent of environmental noise exposure in an area. However, they do not necessarily indicate where noise mitigation measures are required or where they would be cost effective. For this reason it is necessary to set out an approach which seeks to identify locations where noise mitigation measures are necessary and cost effective. Initially, some form of noise level needs to be identified from the onset of the process for the assessment of need. The following sections outline the proposed levels for the assessment of noise mitigation measures due to noise from all road traffic in DLRCC.

6.2.1 Areas with desirable low and undesirable high sound levels

Following a review of existing guidance, as outlined in Chapter 2, and of the levels set the previous noise action plan, the following are the proposed targets for desirable low and undesirable high sound levels:

Desirable Low Sound levels

< 50 dB(A) Lnight

<55 dB(A) Lday

Undesirable High Sound levels

> 55 dB(A) Lnight

<70 dB(A) Lday

6.2.2 Protection Thresholds for Quiet Areas

The Environmental Noise Regulations defines a 'Quiet Area in an agglomeration' as an area, delimited by an action planning authority following consultation with the Agency and approval by the Minister, where particular requirements on exposure to environmental noise shall apply.

A Quiet Area could be an area with low sound levels or an area that should not be exposed to high sound levels due to the type of area or the nature of the activities that take place within it. An area may also be perceived to be quiet although the sound levels may be relatively high. However, in general natural sounds can be soothing regardless of their level. For instance sound levels on St Stephens Green East can occasionally exceed daytime levels of 70 dB, while sound levels in the centre of the Park, range from 57 to 60 dB. Whilst still relatively high, people use this park at lunch and other times to recreate and escape from the hustle and bustle of city life. Some quiet areas may not be noise sensitive at night as they are not in use as an amenity at this time, e.g. parks closed at night.

In this Noise Action Plan, it is proposed to use the following values as one criterion for defining a Quiet Area.

< 45 dB(A) Lnight

< 55 dB(A) Lday

< 55 dB(A) Lden

A second criterion to cover what are perceived as Relatively Quiet Areas is also proposed. These types of locations will be defined by their proximity to areas of high sound levels, and which provide a perceived area of tranquillity. Both quantitative and qualitative assessments will be used to identify these types of locations.

During the implementation of this noise action plan, it is proposed to identify locations that have noise levels below these criteria and review their use. If appropriate or necessary, locations could be identified as quiet areas where the existing noise levels are to be preserved or reduced if possible.

6.3 Application of the Decision/Selection Criteria Matrix

Having identified locations where the threshold has been exceeded, it will be necessary to develop a ranking that seeks to identify locations where noise mitigation measures are necessary, feasible and will be cost effective. To do this, a noise decision support matrix will be used, with details shown in Appendix G.

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, such as the noise exposure level, the type of noise receptor, the type of noise source and the number of people affected. It also facilitates assessing the relative importance of each. As part of this Noise Action Plan, a value of **17 or more** is suggested as the point where priority action should be considered either to reduce excessive sound levels or to preserve low sound levels where they exist. The following sections outline how the results of the application of the decision support matrix analysis will be applied in DLRCC.

6.4 Results from the Matrix analysis - Residential

Arising from the noise mapping, it is possible to identify the number of residential properties exposed to the various bands of sound levels. Although not defined as noise sensitive locations, residential properties are ranked just one point below noise sensitive locations in the decision matrix. Therefore it is essential to know the sound exposure level at each property. The following section outline noise exposure data for residential dwellings in the County with the number of households exposed rounded up or down to the nearest 100.

6.4.1 Residential Areas – DLR Noise Exposure

Table 6.1 provides details of noise exposure levels for various bands arising from all traffic for the 87,700 residential dwellings in the DLRCC Area.

From this we can see that the number of household exposed to high night time levels has reduced since Round 2 of the Noise Action plan. It should be noted that rounding up or down to the nearest '100' of population in each decibel band, causes an over or under estimation of the total true population. However this 'rounding' is a requirement of the Environmental Noise Directive and the 'error' is not considered significant.

Table 6.1 Lnight Noise exposure levels from all roads – DLRCC 2017			
Decibels dB(A)	Lnight number people Exposed 2017	Lnight % people Exposed 2017	Lnight % people Exposed 2012
< 50	74,100	85%	70%
50-55	10,100	12%	12%
55-59	2,500	3%	11%
60-64	900	1%	6%
65-69	100	0	1%
> 70	0	0	0
	87,700		

Further analysis of the noise decision support matrix will be required is to identify the number of residential properties that's have been identified as having a score of 17 or greater thus suggesting priority action should be considered for that location. In addition, application of the noise decision support matrix is required to identify noise sensitive locations.

The following EPA link <https://gis.epa.ie/EPAMaps/> allows you to see noise bands for a particular street/area based on the output from a noise predictor model for all of Ireland including DLRCC. Noise can be found under the heading 'Environment and Well Being'.

7. Noise Mitigation and Protection Measures

7.1 Principles for deciding on action

As part of this Noise Action Plan, a strategic approach will be undertaken to managing environmental noise. In line with the previous Noise Action Plan, it is proposed that the following principles will be adhered to when deciding on the appropriate actions to reduce sound levels and to maintain noise levels where they are considered satisfactory:

- As the noise maps are developed for strategic use only, it is proposed that the basis of the Noise Action Plan should be strategic in nature also and shall not include proposals relating to noise from domestic activity, noise created by neighbours, noise caused by the exposed person themselves or noise at work.
- It is proposed to include actions to manage environmental noise only, primarily from road traffic as this is the dominant sound source.
- Mitigation measures will be prioritised using the decision support matrix. For this Action Plan it is proposed that the higher number achieved the higher the priority for action. A value of 17 or more has been proposed as the point where priority action should be considered.
- The plan shall address priorities that have been identified by the relevant noise target value being exceeded or other relevant criteria established by the EPA and shall in the first instance, address the most important areas identified by the strategic mapping process. The following are the proposed targets.
 - Desirable low sound levels are defined as areas with a night time level less than 50 dB and/or a daytime level less than 55 dB.
 - Undesirable high sound levels are defined areas with a night time level greater than 55 dB and a daytime level greater than 70 dB.
 - Absolute value of below 55 dB(A) daytime, below 45 decibels at night time and below an Lden of 55 dB(A) will be one criterion for defining a Quiet Area.
 - A second criterion for defining for perceived or 'Relatively Quiet' areas. will be defined by their proximity to areas of high sound levels, but which provide a perceived area of tranquillity
- There will be earlier integration of noise abatement planning into the planning process and certain transportation schemes.

7.2 Processing areas above the onset of assessment criteria

Following the prioritisation exercise based on the results of the strategic noise mapping and the decision support matrix, an ordered shortlist of areas will be drawn up which will proceed to the next stage in the process. The aim of this stage is to confirm that the noise levels assessed by the strategic noise mapping are experienced by population and residential dwellings within the areas being addressed.

Prior to the review of potential noise mitigation measures, and any subsequent commitment of budget to undertake any necessary actions, it is considered appropriate to confirm that the noise levels indicated by the strategic noise maps are being experienced by the population within DLRCC.

This will be undertaken by undertaking field survey work and using the noise monitoring network in DLRCC to measure noise levels prior to the commencement of any works.

Field survey work would help with calibration of the strategic noise map, as well as provide information on whether the properties being assessed had noise sensitive rooms exposed on the most exposed facades, or whether noise mitigation measures were already present which may not be indicated within the calculation model.

Once the extent of the existing noise impact has been confirmed for the locations under review, the potential noise mitigation measures will then be investigated, and a cost benefit analysis undertaken for each, with the aim of developing a selection matrix which leads towards a recommendation for action.

This staged approach will help to ensure that any work undertaken is cost effective and will deliver genuine benefit to the residents.

7.3 Preservation of areas below protection threshold

Where areas are identified as being below the onset of 'desirable' threshold, they will be considered for review in the context of the review for quiet areas. In addition to this, if the locations identified have amenity value then the planning process may then be used to help preserve the nature and level of the existing sound environment.

7.4 Management of Areas between the Thresholds

Careful consideration of environmental noise pollution when planning for new developments will be a key factor in the management of the noise environment in the interest of sustainable development. Setting out clear planning policy relating to noise, and incorporating environmental mitigation noise strategies into the development, planning and local area planning processes will help to ensure that the existing noise climate is preserved where appropriate.

With the twin focus on mitigation of noise for the most exposed residents, and preservation through designated quiet areas of the least exposed areas, there is a risk that the majority of households, which sit between these two categories, are not provided for within the action planning process. It is acknowledged that the action plan needs to provide a means of preventing and avoiding detrimental levels of long term noise exposure, and the development of planning guidance plays a key role in support of this target.

The new National Planning Framework has a stated objective of developing national planning guidance relating to environmental noise, until such time as national guidance is available DLRCC will investigate the possibility of developing local planning policy on noise.

7.5 Possible Noise mitigation measures

There are a wide range of potential noise mitigation measures, some of which may act at a national or regional level, others which may be purely localised. Likewise there are a number of levels of authority which may be capable of making actions. A non-exhaustive list of measures includes the following:

- Vehicle noise emissions and tyre noise regulations will be set at EU level;
- National planning guidance or noise regulations will be set at national level;
- Transport policy objectives may be set at regional level;
 - Improved public transport;
 - Getting people out of cars; and
 - Increasing bus, train, bicycle journeys.
- At Local Authority level there are powers to act as follows:
 - Replace diesel vehicles with compressed natural gas / electric;
 - Truck routes;
 - Night time delivery restrictions or limits;
 - Planning permissions;
 - Road closures / traffic routing;
 - Road re-surfacing;
 - Planning zones;
 - Facade insulation requirements;
 - Noise barriers;
 - Public liaison groups; and
 - Long term targets.
- Roads Authorities can undertake the following:
 - Traffic management – routes and HGV's;
 - New road construction (bypass);
 - Re-surface roads;
 - Vehicle speed management;
 - Noise screening measures; and
 - Facade insulation measures.

7.6 Assessment of Options and Cost Benefit Analysis

In general, no one design intervention can provide a solution in an area and often a range of measures will be needed. In general, the best way to minimise the costs of noise prevention and noise reduction is as follows:

- In the case of existing noise sources or sensitive buildings affected by noise, noise mitigation can be coordinated with scheduled maintenance, renewal and modernisation activities insofar as resources will allow.
- Where new noise sources are being created in the vicinity of existing sensitive buildings, or vice versa the most cost effective mitigation is to take it into account from the very beginning of the planning process.
- Where a new noise source is being created, consideration should be given as to whether it is absolutely necessary, and whether the benefits really outweigh the disadvantages. If this is the case then consideration should be given to the location of the noise source so that it causes the minimum possible disturbance.

For the locations where noise has been identified as being an issue, a list of potential noise mitigation actions will be drawn up. In order to undertake an assessment of feasibility and develop a prioritised list of actions, a cost-benefit analysis will be undertaken in order to maximise value for money from investment. The cost-benefit analysis will address lifetime construction and maintenance cost against noise reduction benefit.

The benefit of noise reduction may be viewed in terms of decibels / people / time, and may be considered using an assessment of changes in estimated levels of annoyance or sleep disturbance, or could be monetised to fully process the analysis. Monetisation of noise is becoming increasingly common. The monetary assessment of noise levels tends to take two different approaches;

- (i) impact upon property market value and
- (ii) willingness to pay by residents exposed to noise to produce a reduction.

Due to the lack of a robust Irish Unit Cost for road noise, it is challenging to include noise in a cost-benefit analysis. The EC '*Working Group on Health and Socio-Economic Valuation of Noise 2003*' produce an interim value which was to be reviewed. However a more recent CEDR Report – '*Technical Report 2017-03 State of the art in managing road traffic noise: cost-benefit analysis and cost-effectiveness analysis*' concludes that values provided by the EC are not robust. Still, the unit cost values for road noise provided by the EC are the only 'official' general European values available at this moment for the use in CBA. As was found with the previous Action Plan using this 'official' figure provides a very low 'benefit' price in relation to an overall cost in implementation of any potential noise mitigation measures. In general 'noise benefits' outweighed the cost where mitigation measures 'piggy backed' on other projects which were undertaken and for which the primary aim was not noise mitigation i.e. relaying of sewers or drains where a quieter road surface could replace the older road surface.

Box 4

Cost-effectiveness issues As well as their ability to reduce noise pollution, the cost-efficiency of abatement approaches is a critical consideration for decision makers, who are often operating within tight budgetary limits. Important considerations include the cost of implementation, as well as the cost of maintenance/renewal, the availability of resources and relevant funding schemes. An important decision-support tool is cost-benefit analysis, which can help to prioritise different noise abatement options and ensure that limited funds are spent to greatest effect (Kloth *et al.*, 2008). The European EPA Network Interest Group on Traffic Noise Abatement (Blokland and Peeters, 2016) recently made a suite of recommendations for traffic noise abatement, including developing a standard procedure for cost benefit assessment and making decisions on investment open to the public. Cost varies widely between local noise abatement measures.

Noise barriers have an estimated cost of €300 per m² (Kloth *et al.*, 2008), with a varying cost to benefit ratio depending on the specifics of the site, such as the population density and the type of barrier. Tunnels are both the most expensive and most effective form of noise barrier. Overall, noise barriers are considered the least cost-effective approach, despite their significant noise abatement ability (Guarinoni *et al.*, 2012).

For façade insulation, costs are generally high compared to other measures, but comparatively little when implemented in new buildings with high thermal insulation standards (Kloth *et al.*, 2008). It has been estimated that the average cost, per apartment, for insulation is around €28 000 (Kæboe *et al.*, 2011). Façade insulation may be more cost-effective than low noise road surfaces (Kæboe *et al.*, 2011), which have an estimated cost of €3.5 per m² (Nijland *et al.*, 2003). Their respective benefits however depends on how densely populated an area is (with insulation being more effective in less densely populated areas).

Low noise tyres are considered particularly cost-effective, due to their significant noise abatement but minimal side effects. Quiet tyres can reduce noise by around 4 dB at no additional cost (Nijland *et al.*, 2003).

Traffic management measures are some of the most affordable measures. Static signs to impose speed limits or ban heavy goods vehicles for example are relatively cheap, with an estimated cost of €300 per sign (Kloth *et al.*, 2008).

Broadly speaking, the most cost effective approach is often to use a combination of strategies. Overall, comparisons of the (discounted) costs and benefits of road and rail traffic noise abatement measures suggest that the benefits are higher than the costs in all cases (Nijland *et al.*, 2003)

Extract from Science for Environment Policy: Noise Abatement

The CEDR Report indicates that cost effectiveness analysis(CEA) ‘*is most useful when you know the outcome you desire (for example noise reduction), one main objective for the project, and the determination for which a set of alternative solutions achieves the greatest noise reduction for the costs (for example, the use of noise barriers compared to noise reducing asphalt). It is also useful in cases where major outcomes are either intangible or otherwise difficult to monetize*’ as may be the case for CBA.

In summary it states, ‘*CEA can be used as a second-best option when a full CBA is not achievable or as a final step, when the objectives of the projects have been identified and the only remaining question is to find the least-cost option (Gorlach, undated) for example to fulfil required noise guidelines. The disadvantage of cost-effectiveness analysis is that it does not identify the benefits of actions or society’s willingness to pay for improving the environment*’.

8. Noise Implementation Plan

8.1 Objective of the Noise Action Plan

The key objective of the Noise Action Plan 2018-2023 is to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, due to long term exposure to environmental noise. This will be achieved by taking a strategic approach to managing environmental noise and undertaking a balanced approach in the context of sustainable development.

It is proposed that the Noise Action Plan will be implemented through a staged process over 5 years with DLRCC endeavouring to follow the time frame set out below in relation to the programme of works under various headings. Although the Council directly funds and provides resources for the preparation of the Noise Maps and the Noise Action Plan, specific funding in relation to the implementation of the END has not been made available at national level to DLRCC. Accordingly, the level of progress and resourcing in the implementation of the plan is affected by the economic and overall budgetary constraints experienced by the Council from year to year.

8.2 Proposed Action Plan measures

A number of measures are proposed as part of this plan to prevent noise and reduce, avoid or relocate the various types of noise source. As per the previous plan, these measures focus mainly on road traffic sound emissions. These measures will be the primary measures considered when deciding on action to prevent, reduce avoid or relocate sources of high sound levels.

8.2.1 Identify Priority Areas

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

On completion of the initial assessment, a field survey of actual noise levels shall be carried out to verify the initial findings and confirm the order of priority for treatment. As part of the establishment of the order of priority, the most appropriate and cost effective mitigation measures shall be identified to optimise the return from the mitigation process.

A decision support matrix as outlined in Section 6.3 and similar to that in Appendix G will be generated to facilitate this process. On implementation of the noise mitigation measures, the areas in question shall be resurveyed to establish the effectiveness and extent of the mitigation measures.

Prior to the review of potential noise mitigation measures, and any subsequent commitment of budget to undertake any necessary actions, the noise levels assessed by the strategic noise mapping will be validated to ensure there are being experienced by population and residential dwellings within the areas being addressed. External noise consultants will be appointed for the purpose of carrying out the field verification studies.

8.2.2 Traffic noise reduction and prevention measures

Increasing traffic volumes affect air quality and the acoustic environment. The challenge is how to manage demand for limited road space and thus minimise traffic congestion, where possible, resulting in improved air quality and reduced noise emissions. The aim is to manage these issues through specific transport measures as outlined in the County Development Plan.

Traffic can have environmental and safety impacts which need to be addressed and minimised through measures such as traffic calming, layout/road re-design, and through monitoring of polluting emissions such as noise. The launch of the Design Manual for Urban Roads and Streets (DMURS) jointly by the Department of Environment, Community and Local Government and Department of Transport, Tourism and Sport places a new focus on the role of streets in sustainable place-making and encourages layouts that are suited to all users. It is the policy of the Council to support the sustainable principles set out in the DMURS.

Significant road/cycle infrastructure schemes are being progressed in the County and sustainable travel initiatives developed on a continual basis as development needs arise and funding is made available. Further development of the cycle, bus and rail network is essential to cater for a growing population and increased demand for multi-modal travel options.

As part of the plan, the following strategic measures will be introduced in the coming years over each year of the Noise Action Plan:

Action	Agencies
Work with key agencies in the development of cycle infrastructure schemes and sustainable road schemes along key routes in the County including the following schemes: - Rock Road corridor cycle and bus improvements - Stillorgan Road cycle and bus improvements - Clonskeagh to Sandyford cycle improvements - Development of the Dodder Greenway - Blackglenn Road / Harold's Grange Road improvements - Bracken Road link in Sandyford	NTA, TII DTTAS
Work with key agencies in the implementation the Bus Connects Project in the County and in particular focussing on the following corridors: - Rock Road Corridor - Stillorgan Road Corridor - Dundrum to Dun Laoghaire Orbital Route - Other Orbital bus routes	NTA, Dublin Bus
Work with key agencies in the development of key rail links in the County - Green Luas Line extension to Bray - Metrolink – Sandyford to North Dublin	NTA, TII
Work with key agencies and Energy suppliers in the expansion of the network of Electric Vehicle Charge Points in the County.	DCCAE
Further expansion of the County Stationless Bike Share Scheme and the development of bye-laws	DLRCC, NTA
Review of County Wide Speed Limits and further implementation of 30kph speed limit and slow zones.	DLRCC, DTTAS
Ongoing maintenance of the road network and examine the use of noise reduction road surfacing material	DLRCC
Upgrade of the Council Fleet vehicles to more environmentally friendly options	DLRCC

8.2.3 Noise in the Planning Process

The planning system has the potential to exercise a significant influence on the control of future exposure to environmental noise and can play a key role in the improvement of amenity. The appropriate use of the planning system can help avoid, or minimise, the adverse impacts of noise without placing unreasonable restrictions on development. Scope exists within the planning and development management process to manage increased levels of noise arising from new development where exposure levels can be harmful to health.

There are two main scenarios in development where noise could be considered as being a material issue, namely:

- 1) Introducing people into potentially noisy areas through the provision new residential housing, hospital, schools nursing homes etc in the vicinity of existing road rail industrial or airport noise, or where there are potential high levels of noise with buildings or in adjoining gardens or public open spaces.
- 2) Introducing potentially noisy developments such as new or altered roads, railways, industrial sites, and airports, commercial or large sporting recreational developments into the vicinity of noise sensitive locations.

In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA has suggested that in the interim that Action Planning Authorities should examine the planning policy guidance notes issued in England titled, 'ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise'. This has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

In advance of any national guidance relating to noise in the Planning Process, the following actions relating to planning and development will be considered for implementation:

- a) To review existing guidelines and policy relating to Noise in the County Development Plan and to ensure noise is a consideration in Local Area Plans and Part 8's and enhanced in the next County Development Plan.
- b) To develop guidance note on Noise considerations in the planning process that can be issued to developers at pre- planning stage.
- c) To require developers to produce a sound impact assessment and mitigation plans, where necessary, for any new development where the Planning Authority considers that any new development will impact negatively on pre-existing environmental sound levels within their Council area.
- d) To ensure that future developments are designed and constructed in accordance with best Irish practice to minimise noise disturbances through good acoustic design and take into account the multi-function uses of street (e.g. movement, recreation) and to ensure central areas of large mixed use developments are quiet.

The following are some timelines to be considered as part of the Noise Action Plan relation to further incorporation of noise in the planning process.

Action	2018	2019	2020	2021	2022
Work with Planners to identify how Noise can become a key consideration in the planning of major development and LAP's					
Examine means of making the Noise Maps readily available for use by Planners. This may include inclusion of noise contours in internal planning systems such as APAS (or similar).					
Carry out research on the UK experience in dealing with noise in the planning process and prepare a Guidance Note to be issued at pre-planning stage in relation to best practice.					
Develop a policy statement on Noise in the Planning process that could be incorporated into the next County Development Plan.					

8.2.4 Protecting 'Quiet Areas'

Quiet areas offer many opportunities for public recreation. They are thus not only of value to their residents, but can also improve the quality of life of people living in adjacent but noisy roads, by affording opportunities for peaceful recreation from time to time. Hence, it is very important that existing quiet areas be preserved, and that new ones be created where possible. While one aim of the action plan is to reduce human exposure to high sound levels, another important goal is to preserve areas, which are still 'tranquil' or quiet. As part of the plan, there will be an ongoing process of identifying Quiet Areas and forwarding them to the Minister for the Environment, Community and Local Government for delimiting as Quiet Areas.

The following are some timelines to be considered as part of the Noise Action Plan relation to the protection of Quiet Areas in the County.

Action	2018	2019	2020	2021	2022
Hold preliminary discussions with the Parks Section and identify potential parks in the County					
Carry out some noise monitoring within the identified parks					
Prepare report on findings and present to the Area Committee					
Commence the process for preparing a Quiet Area					

8.2.5 Sound Monitoring network

As outlined in Section 4.3.4, a permanent ambient sound monitoring network was established in the Dublin area with units set up in each of the Local Authorities with seven locations in DLRCC. The units are designed to operate continuously, recording sound levels and statistical information to allow analysis of trends in noise emissions. Data from the sound monitor can be found at the following link; <http://dublin-noise.sonitussystems.com/>. As part of Year 1 and 2 of this Noise Action Plan, further locations will be identified and added to the network.

8.2.6 Noise Complaint Investigation and Control procedures

Although the noise maps and the Environmental Noise Regulations are aimed at developing strategic policy, it is acknowledged that when most people complain about noise, it relates more to local issues such as neighbour, entertainment and construction noises. However, it is envisaged that this noise action plan should solely concentrate on strategic issues identified by the noise mapping as systems are already in place to deal with noise nuisances, including neighbour, entertainment and construction noises. Local noise issues will be dealt with by each Local Authority as required by the Environmental Protection Agency Act 1992 (EPA Act 1992).

9. Public Consultation

In preparing and revising this draft Noise Action Plan, Action Planning Authorities must ensure the following:

- The public is consulted about proposals for Action Plans;
- The results of the public participation are taken into account;
- The public is informed of the decisions taken; and
- Reasonable time frames are provided allowing sufficient time for each stage of public participation.

In accordance with the Environmental Noise Regulations, Action Planning Authorities shall for the purpose of making and approving plans consult with the Environment Protection Agency and the noise mapping bodies for the noise maps involved i.e. Iarnród Éireann and Transport Infrastructure Ireland or the relevant roads authority.

A Public Consultation process was carried out on the draft Dublin Agglomeration Noise Action Plan in accordance with the requirements of the Environmental Noise Regulations 2006.

The draft Noise Action Plan and Noise Mapping Report were brought, for noting, and to Dún Laoghaire Area Committee (Municipal Services) on November 21st, 2018 and to the Dundrum Area Committee (Municipal Services) on December 3rd, 2018 and comments at the meeting were noted. Details of the Public Consultation were sent by e-mail to all the Elected Members on November 7th and copies of the draft Noise Action Plan was made available in County Hall and in the Dundrum Area Office.

Scheme details were made available on the dlr Consultation Online Hub at <https://dlrcoco.citizenspace.com/transportation/dublin-noise-action-plan-public-consultation/> where members of the public could complete an Online Survey about the scheme and this was widely promoted through Twitter and Facebook. An advert was also placed in the Irish Times and Irish Independent which have a wide circulation.

A total of 3 submissions were received through the Online Survey form and 5 by email to info@dlrcoco.ie during this period. The following Bodies\Agencies will be notified of the public consultation process

- Department of Communications, Climate Action and Environment
- Department of Transport, Tourism and Sport
- National Transport Authority
- Environmental Protection Agency
- Health Service Executive
- Iarnród Éireann
- Transport Infrastructure Ireland

The majority of the submissions were concerned with noise arising from high traffic volumes on main roads, in particular on the following;

1. Along the N11, M50 and M11
2. Rathmichael Area
3. Ballyogan Road from traffic and Luas
4. Allies River Road

As part of the plan, the Council intend to engage with Transport infrastructure Ireland to review and discuss potential noise mitigation measures following a process of examine locations. A number of submission also requested further engagement with the EPA regarding the funding of Noise mitigation measures and planning and this will also be carried out as part of the plan

All submission made during the Public Consultation will be reviewed and considered and included in the Action Plan where appropriate.

9.1 Next steps

Following the Public Consultation process, no significant amendments were made to DLRCC element of the Noise Action Plan (Volume 2) other than updating exposure data for DLRCC from Luas and the Dart (Sections 5.7.2 and 5.7.3). Some additional information was included on the cost effectiveness of various measures (section 7.6). In addition, Section 9 on public consultation was updated. The final Noise Action Plan will be sent to the Chief Executive for approval and the final draft of the Dublin Agglomeration Noise Action Plan will be brought to the Council for noting.

10. Summary and Conclusions

This Noise Action Plan has been prepared as required by the Environmental Noise Regulations 2006, Statutory Instrument 140 of 2006. These Regulations give effect to EU Directive 2002/49/EC relating to the assessment and management of environmental noise.

The objective of the Noise Action Plan is to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects, including annoyance, due to long term exposure to environmental noise. This will be achieved by taking a strategic approach to managing environmental noise and following a balanced approach which promotes in the context of sustainable development.

This Noise Action Plan primarily considers the long term environmental noise impact from road traffic noise sources, and sets out an approach to review noise impact levels near to the major sources assessed during the strategic noise mapping in 2017. In the interests of equality and promotion of best practice the Action Plan also sets out a number of proposals for the prevention and avoidance of environmental noise levels detrimental to human health to be implemented through the planning process.

The following highlights the main finding from the noise assessment arising from the noise mapping:

- Of the 218,000 people living in the Dún Laoghaire - Rathdown County Council area in 2017, 37% of people have been found to be exposed to noise levels greater than 55 dB(A) Lden, reducing from 68% in 2012.
- The percentage of people exposed to the desirable night time noise levels has been found to be 72% in 2017, which represents an improvement from less 50% in 2012.
- The number of people exposed to the undesirable night time levels above 55 dB(A) has reduced from 29% in 2012 to 15% in 2017 with low numbers exposed to night time sound levels above 70 dB(A), i.e. 300 people.

At the end of the Noise Action Plan, a review of the programme of works and policies developed over the first 5 years assessing the effectiveness of the measures adopted and determining if the measures were cost effective and value for money.

Appendices

Appendix A - Glossary of Acoustic and Technical Terms

Agglomeration: 'Agglomeration' shall mean part of a territory, delimited by the Member State, having a population in excess of 100,000 persons and a population density such that the Member State considers it to be an urbanised area.

Agglomeration of Dublin: 'Agglomeration of Dublin' means the county borough of Dublin, the administrative county of Dun Laoghaire/Rathdown other than those areas excluded in the First Schedule to the Air Pollution Act 1987 (Marketing, Sale and Distribution of Fuels) Regulations 1998 (S.I. No. 118 of 1998), and the administrative counties of Fingal and South Dublin;

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. Noise is sometimes defined as unwanted sound.

Decibel dB(A) : A unit of measurement of sound.

L_{den}: (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_{den} is calculated as follows:

$$L_{den} = 10 * \log 1/24 \{12*10^{(L_{day}/10)} + 4*10^{((L_{evening}+5)/10)} + 8*10^{((L_{night}+10)/10)}\}$$

Daytime: Between the hours of 7am and 7pm

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

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

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.

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

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

'Major intensification': An Action(s) that is likely to lead to a breach of any statutory sound limit, or national guide value or standard, or an action(s) that leads to an increase in sound levels above the undesirable sound levels' or likely to increase the pre-existing annual L_{den} by more than 5dB

Noise Indicator: Method used to measure or quantify sound, in decibels, in order to equate it with what might be perceived as noise.

Appendix B - Bibliography and References

Legislation

European Communities (Access to Information on the Environment) Regulations 2007, (S.I. No. 133 of 2007).

European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006, (S.I. No. 241 of 2006).

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

Planning and Development (Strategic Environmental Assessment) Regulations 2004, (S.I. No. 436 of 2004).

Environmental Protection Agency Acts 1992 and 2003.

Environmental Protection Agency Act, 1992 (Noise) Regulations, 1994 (S.I. No. 179 of 1994).

First Schedule to the Air Pollution Act 1987 (Marketing, Sale and Distribution of Fuels) Regulations 1998 (S.I. No. 118 of 1998).

European Commission (2003). Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information. OJ L 41, 14/02/2003, Luxembourg 2003.

European Commission (2002). Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise. OJ L 189, 18/07/2002, Luxembourg 2002.

Irish Publications

Department of the Environment, Heritage and Local Government, Sustainable Residential Development in Urban Areas - guidelines for Planning Authorities, May 2009.

Department of the Environment, Heritage and Local Government, Urban Design Manual: A best practice guide. A companion document to the Planning Guidelines on Sustainable Residential Development in Urban Areas, May 2009.

Department of the Environment, Heritage and Local Government, Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities, Draft Update, December 2017.

Department of the Environment, Heritage and Local Government, European Communities (Access to Information on the Environment) Regulations 2007 (S.I. No. 133 of 2007) - Guidance for Public Authorities and others in relation to Implementation of the Regulations, 2007.

Department of the Environment, Heritage and Local Government, Building Regulations 2014, Technical Guidance Document E – Sound, 2014.

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

TII, Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 20014.

EPA Publications

Environmental Protection Agency, Guidance Note for Strategic Noise Mapping for the Environmental Noise Regulations 2006, Version 2.0 August 2011

Environmental Protection Agency, Guidance Note for Noise in relation to Scheduled Activities, 2016.

Environmental Protection Agency, Environmental Quality Objectives – Noise in Quiet Areas (2000-MS-14-M1), Environmental RTDI Programme 2000 – 2006. (Authors Waugh, D., Durucan, et. al.), 2003.

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Appendix C
Strategic Environmental Assessment (SEA) Screening
Screening Statement

The purpose of this report is to establish whether or not a Strategic Environmental Assessment (SEA) should be carried out on the Dún Laoghaire Rathdown County Council 'Draft Noise Action Plan 2018-2023 that forms part of the Dublin Agglomeration Noise Action Plan. It is recommended by the EPA that an SEA pre-screening of the Action Plan and associated consultation with relevant environmental authorities is carried out as part of the public consultation process. This SEA pre-screening determines whether the Round 3 Action Plans could potentially give rise to some significant negative environmental effects.

Purpose of the Plan

The purpose of the draft Noise Action Plan is to develop a clear and integrated set of actions providing for the assessment of environmental noise but which notably address priorities based upon 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 acoustic quality where it is good. The focus of the draft action plan is to set down actions at a strategic level, to manage noise issues and effects, including noise reduction if necessary.

Background to the Draft Noise Action Plans 2018-2023

This draft Noise Action Plan will replace the current Noise Action Plan 2013-2018. The plan provides an overview of regulations, reviews the results of the latest strategic noise maps for Dún Laoghaire-Rathdown County Council and sets out an approach to the strategic management and control of environmental noise over the next five years. As there is no provision in legislation upon which the actions outlined in the Plan can be enforced, reliance will be made on various other plans and policies such as the County Development Plan, the Draft National Planning Framework 2040 and the Planning Acts, for their implementation. This draft plan also provides the basis for feedback and input from statutory authorities and the public to help *inform this draft Noise Action Plan in relation to the assessment and management of environmental noise.*

Policy

The draft Noise Action Plan relates to the Dún Laoghaire-Rathdown Council region. As required by the EU Directive 2002/49/EC relating to The Assessment and Management of Environmental Noise, (known as the 'END' Directive) which was transposed into Irish law by the Environmental Noise Regulations, SI number 140 of 2006, this draft Action Plan is aimed at managing 'Environmental Noise'. Dún Laoghaire-Rathdown Council has prepared this draft plan for the Dún Laoghaire-Rathdown Council region which will form part of a combined plan for the Dublin Agglomeration i.e. the region covered by Dublin City Council, Fingal County Council, South Dublin

County Council and Dún Laoghaire-Rathdown County Council, who are the designated action planning authorities under article 7 of the Environmental Noise Regulations 2006. It is proposed that this plan will be in place on the expiration of the current plan in November 2018 and will cover the period between December 2018 and November 2023.

Policy

A SEA pre-screening was carried out to determine whether the Draft Noise Action Plan relating to the Assessment and Management of Environmental Noise required a full SEA. The type of pre-screening checks that were completed are outlined in the EPA report 'Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland'. (Appendix B; SEA Checklist)². The screening is based on a systematic evaluation of the criteria in Annex II of the SEA Directive (Schedule 1 of the SEA Regs).

Task 1.1 Apply pre-screening check using decision-tree

The pre-screening check is based on questions of an administrative nature, which can be rapidly checked by the authority to determine whether the P/P should be taken to the second screening stage. It allows rapid screening-out of those P/Ps that are clearly not going to have any environmental impact and screening-in of those that definitely do require SEA.

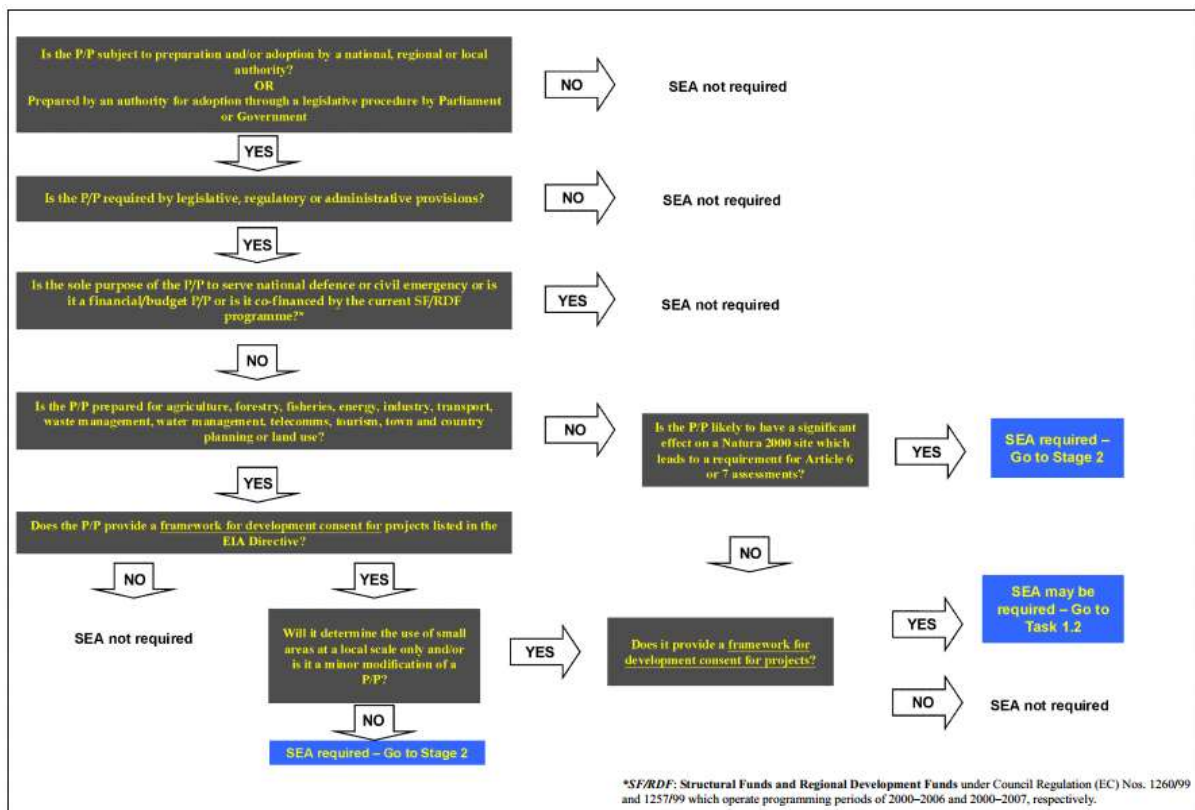
A "decision-tree" or flowchart is provided which simplifies the complex wording of the SEA Directive into a systematic and logical series of questions. This is shown in Fig. 1.

The decision-tree uses the criteria set out in the SEA Directive to decide if SEA is required or not. Unlike the environmental significance screening criteria, which are used in Task 1.2, the questions in the decision-tree are more "administrative" in nature and are based upon the status of the P/P in question.

As a result of this Task, the following possible outcomes could arise:

1. P/P applies to one or more of the 11 sectors quoted in the SEA Directive and provides a framework for development consent of projects requiring EIA. It should, therefore, be taken forward to Stage 2.
2. P/P will significantly affect a Natura 2000 site and, therefore, requires an assessment under the Habitats Directive. It can be moved forward to Stage 2.
3. The P/P does not fall into any of the sectors covered by the Directive, it will not significantly affect a Natura 2000 site nor does it provide a framework for development consent. It is, therefore, screened-out by the pre-screening check and no further consideration of its possible impacts is required. Under such circumstances, a note, highlighting the screening criteria applied and the decisions taken, would be kept on all relevant files.
4. The P/P is not screened-out and may require more detailed checks to be undertaken (this will apply to a small scale P/P or minor modifications of a P/P). This may involve the application of "Environmental Significance Screening Criteria" as described below

Extract from 'Development of SEA methodologies for plans and programmes in Ireland'- EPA



The Pre-screening Statement, which presents the results of the required task 1.1, is set out below

Stage 1 – SEA Pre-Screening of Plans and Programmes (P/P) - decision-tree

Is the P/P subject to preparation and/or adoption by a national, regional or local authority? OR Prepared by an authority for adoption through a legislative procedure by Parliament or Government	Yes. The Noise Action Plan is required to be made or revised every 5 years for the Agglomeration of Dublin under Directive 2002/49/EC and S.I. No. 140 of 2006, Environmental Noise Regulations and required to be adopted by Dún Laoghaire-Rathdown Council, being an Action Planning Authority.
Is the P/P required by legislative, regulatory or administrative provisions?	Yes. The draft Noise Action Plan is required to be made or revised every 5 years for the Agglomeration of Dublin under Directive 2002/49/EC and S.I. No. 140 of 2006, Environmental Noise Regulations
Is the sole purpose of the P/P to serve national defence or civil emergency or is it a financial/budget P/P or is it co-financed by the current SF/RDF programme	No
Is the P/P prepared for agriculture, forestry, fisheries, energy, industry,	Yes. The draft Noise Action Plan mainly relates to the management of Transport and Land Use.

transport, waste management, water management, telecoms, tourism, town and country planning or land use?	
Does the P/P provide a framework for the development consent for projects listed in the EIA Directive?	No. The plan does not the set the framework for projects and other activities listed in the EIA Directive and attached to the end of this pre-screening report for completeness. As the Noise Mapping stage has excluded major industries as listed in the EIA Directive, Annex I&II from assessment, and as this draft Action Plan will primarily base its actions on the outputs of the noise mapping process and as the control of major industry and major projects are managed and controlled by other legislation, it is not proposed that the draft Action Plan will cover such major industry or projects. Fig.1 EPA SEA Pre-Screening Guidance Task 1.1 establishes whether the relevant P/P must undergo an SEA. It uses a series of procedural tasks, firstly to consider the overall characteristics of the P/P to see if it falls within the requirements of the SEA Directive. Task 1.2 requires the potential environmental significance of implementing the proposed P/P to be gauged according to a series of significance criteria. As the pre-screening indicated that the Action Plan did not provide a framework for development consent for projects listed in the EIA Directive and therefore does not require a full SEA, this second task was not proceeded with and it was therefore not considered necessary to undertake any further stages of the SEA process. The SEA Directive requires that the results of the screening process, as required by Article 3(5) and including the reasons for not requiring an SEA are made publicly available. The draft Noise Action Plan informs how Dún Laoghaire-Rathdown Council County Council fulfils its obligations under the Environmental Noise Directive 2002/49/EC which provides the objective of assessing and managing environmental noise. The draft Noise Action Plan is

	relevant for other plans and programmes that will influence the assessment and management of noise. Therefore the draft Action Plan will be in line with programmes such as:- ○ The Dún Laoghaire-Rathdown County Development Plan. ○ The Draft National Planning Framework 2040. ○ Local Area Plans. ○ Transport strategy for the Greater Dublin Area, 2016 to 2030. ○ Smarter Travel – A Sustainable Transport Future 2009-2020 ○ National Cycle Policy Framework 2009-2020. The draft Noise Action Plan will have a positive impact on the environment with respect to the assessment and management of environmental noise and no environmental problems are envisaged as result of the plan. For the most part actions proposed under this draft Action Plan will rely on various other planning frameworks and policies, such as the County Development Plan, the Draft National Planning Framework 2040 and the Planning Acts, for their progression and implementation.
Is the P/P likely to have a significant effect on a Natura 2000 site which leads to a requirement for Article 6 or 7 assessments?	No. Appropriate Assessment Screening was carried out and based on the 'Screening Matrix' and 'Finding of No Significant Effects Matrix' it was concluded that there will be no direct, indirect or cumulative impact on any Natura 2000 site on implementation of the draft Action Plan. Accordingly, it has been determined that an Appropriate Assessment (AA) is not required. The AA Screening is attached to the Draft Action Plan in Appendix D.

Task 1.1 establishes whether the relevant P/P must undergo an SEA. It uses a series of procedural tasks, firstly to consider the overall characteristics of the P/P to see if it falls within the requirements of the SEA Directive. Task 1.2 requires the potential environmental significance of implementing the proposed P/P to be gauged according to a series of significance criteria. As the pre-screening indicated that the Action Plan did not provide a framework for development consent for projects listed in the EIA Directive and therefore does not require a full SEA, this second task was not proceeded with and it was therefore not considered necessary to undertake any further stages of

the SEA process. The SEA Directive requires that the results of the screening process, as required by Article 3(5) and including the reasons for not requiring an SEA are made publicly available.

ANNEX I PROJECTS REFERRED TO IN ARTICLE 4(1) EIA Directive

1. Crude-oil refineries (excluding undertakings manufacturing only lubricants from crude oil) and installations for the gasification and liquefaction of 500 tonnes or more of coal or bituminous shale per day.
2. (a) Thermal power stations and other combustion installations with a heat output of 300 megawatts or more; (b) Nuclear power stations and other nuclear reactors including the dismantling or decommissioning of such power stations or reactors [1] (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load).
3. (a) Installations for the reprocessing of irradiated nuclear fuel; (b) Installations designed: (i) for the production or enrichment of nuclear fuel; (ii) for the processing of irradiated nuclear fuel or high-level radioactive waste; (iii) for the final disposal of irradiated nuclear fuel; (iv) solely for the final disposal of radioactive waste; (v) solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site.
4. (a) Integrated works for the initial smelting of cast iron and steel; (b) Installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes.
5. Installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos: for asbestos-cement products, with an annual production of more than 20000 tonnes of finished products, for friction material, with an annual production of more than 50 tonnes of finished products, and for other uses of asbestos, utilisation of more than 200 tonnes per year.
6. Integrated chemical installations, i.e. those installations for the manufacture on an industrial scale of substances using chemical conversion processes, in which several units are juxtaposed and are functionally linked to one another and which are: (a) for the production of basic organic chemicals; (b) for the production of basic inorganic chemicals; (c) for the production of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers); (d) for the production of basic plant health products and of biocides; (e) for the production of basic pharmaceutical products using a chemical or biological process; (f) for the production of explosives.
7. (a) Construction of lines for long-distance railway traffic and of airports [2] with a basic runway length of 2100 m or more; (a) Construction of motorways and express roads [3]; (b) Construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road or realigned and/or widened section of road would be 10 km or more in a continuous length.
8. (a) Inland waterways and ports for inland-waterway traffic which permit the passage of vessels of over 1350 tonnes; (a) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1350 tonnes.

9. Waste disposal installations for the incineration, chemical treatment as defined in Annex I to Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on

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waste [4] under heading D9, or landfill of hazardous waste, as defined in point 2 of Article 3 of that Directive.

10. Waste disposal installations for the incineration or chemical treatment as defined in Annex I to Directive 2008/98/EC under heading D9 of non-hazardous waste with a capacity exceeding 100 tonnes per day.

11. Groundwater abstraction or artificial groundwater recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.

12. (a) Works for the transfer of water resources between river basins where that transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres/year; (b) In all other cases, works for the transfer of water resources between river basins where the multi-annual average flow of the basin of abstraction exceeds 2000 million cubic metres/year and where the amount of water transferred exceeds 5 % of that flow. In both cases transfers of piped drinking water are excluded.

13. Waste water treatment plants with a capacity exceeding 150000 population equivalent as defined in point 6 of Article 2 of Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment [5].

14. Extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes/day in the case of petroleum and 500000 cubic metres/day in the case of gas.

15. Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres.

16. Pipelines with a diameter of more than 800 mm and a length of more than 40 km: (a) for the transport of gas, oil, chemicals; (b) for the transport of carbon dioxide (CO₂) streams for the purposes of geological storage, including associated booster stations.

17. Installations for the intensive rearing of poultry or pigs with more than: (a) 85000 places for broilers, 60000 places for hens; (b) 3000 places for production pigs (over 30 kg); or (c) 900 places for sows.

18. Industrial plants for the production of: (a) pulp from timber or similar fibrous materials; (b) paper and board with a production capacity exceeding 200 tonnes per day.

19. Quarries and open-cast mining where the surface of the site exceeds 25 hectares, or peat extraction, where the surface of the site exceeds 150 hectares.

20. Construction of overhead electrical power lines with a voltage of 220 kV or more and a length of more than 15 km.

21. Installations for storage of petroleum, petrochemical, or chemical products with a capacity of 200000 tonnes or more.

22. Storage sites pursuant to Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide [6].

23. Installations for the capture of CO₂ streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations covered by this Annex, or where the total yearly capture of CO₂ is 1,5 megatonnes or more.

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24. Any change to or extension of projects listed in this Annex where such a change or extension in itself meets the thresholds, if any, set out in this Annex. [1] Nuclear power stations and other nuclear reactors cease to be such an installation when all nuclear fuel and other radioactively contaminated elements have been removed permanently from the installation site. [2] For the purposes of this Directive, "airport" means an airport which complies with the definition in the 1944 Chicago Convention setting up the International Civil Aviation Organisation (Annex 14). [3] For the purposes of this Directive, "express road" means a road which complies with the definition in the European Agreement on Main International Traffic Arteries of 15 November 1975.

Appendix D
APPROPRIATE ASSESSMENT SCREENING
In Accordance With the Requirements Of
ARTICLE 6(3) Of the EU HABITATS DIRECTIVE For The
Draft Noise Action Plan 2018-2023

INTRODUCTION

This is an Appropriate Assessment Screening of the proposed **Draft Noise Action Plan relating to The Assessment & Management of Environmental Noise**

The proposed draft Action Plan has been assessed to ascertain if it is required to be subject to an 'Appropriate Assessment' under the EU Habitats Directive. Based on the 'Methodological guidance on the provision of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, a 'Screening Matrix' and a 'Finding of No Significant Effects Matrix' have been completed.

The principal trigger for undertaking an 'Appropriate Assessment' would be if the proposed draft Action Plan is likely to have significant effects on a Natura 2000 site. For the purposes of Article 6 assessments, Natura 2000 sites are those identified as Sites of Community Importance under the Habitats Directive (normally called Special Areas of Conservation) or classified as Special Protection Areas under the Birds Directive (79/409/EEC).

There are no Natura 2000 sites specifically linked to the proposed draft Action Plan.

The Natura 2000 sites within or close to the area covered by the Draft Action Plans and within the Dublin region are as follows:-

1. North Dublin Bay cSAC (IE000206)
2. South Dublin Bay cSAC (IE000210)
3. North Bull Island SPA (IE00406)
4. South Dublin Bay & River Tolka Estuary SPA (IE004024)
5. Howth Head Coast SPA (IE004113)
6. Baldoyle Bay SPA (IE004116)
7. Baldoyle Bay cSAC (IE000199)
8. Howth Head cSAC (IE000202) Irelands Eye cSAC (IE002193)
9. Irelands Eye SPA (IE004117)
10. Malahide Estuary cSAC (IE000205)
11. Malahide Estuary SPA (IE004025)
12. Glenasmole Valley cSAC (IE001209)
13. Wicklow Mountains cSAC (IE002122) Dalkey Island SPA (IE004172)
14. Rockabill to Dalkey Islands cSAC (IE003000)

managing 'Environmental Noise'. This draft Noise Action Plan has been prepared for the Dún Laoghaire-Rathdown Council region which will form part of a combined plan for the Dublin Agglomeration i.e. the region covered by Dublin City Council, Fingal County Council, South Dublin County Council and Dún Laoghaire-Rathdown County Council, who are the designated action planning authorities under article 7 of the Environmental Noise Regulations 2006. It is proposed that this plan will be in place on the expiration of the current plan in November 2018 and will cover the period between December 2018 and November 2023.

Brief description of the Natura 2000 sites

Screening Matrix Brief Description of Project or Plan

It is proposed that this draft Noise Action Plan will replace the current Noise Action Plan 2013-2018. The Plan will provide an overview of regulation, review the results of the latest strategic noise maps for Dún Laoghaire-Rathdown and set out an approach to the strategic management and control of environmental noise over the next five years.

The proposed draft Action Plan does not directly affect any Natura 2000 sites. The closest Natura 2000 sites are located within Dublin Bay and include a wide variety of inter-tidal, marine and coastal zoned habitats supporting a range of species including Annex 1 bird species.

Assessment Criteria

Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: The draft Noise Action Plan does not directly affect any Natura 2000 sites. There are no likely direct impacts on any Natura 2000 sites as a result of the proposed plan. Size and scale; Any relevant future new actions under the Action Plan will be in line with established plans and policies such as the Dublin Development Plan, the Draft National Planning Framework 2040 and the Planning Acts, for their implementation and is not predicted to have any likely impact on the conservation function of any Natura 2000 site in respect to size or scale. Land-take; Not applicable Distance from Natura 2000 site or key features of the site; The Draft Action Plan is not predicted to have any likely impact on the key features or the conservation function of any Natura 2000 sites. Resource requirements (water abstraction etc); Not applicable.

Emission (disposal to land, water or air); No predicted likely direct impact on the conservation function of any Natura 2000 site is predicted as a result of the implementation of the proposed draft Action Plan.

Excavation requirements; Not Applicable.

Transportation requirements; Not Applicable. Duration of construction, operation, decommissioning, etc; Not Applicable. Other None

Describe any likely changes to the site arising as a result of: Reduction of habitat area: Not applicable Disturbance to key species; Not Applicable Habitat or species fragmentation; Not applicable Reduction in species density; Not Applicable Changes in key indicators of conservation value Not Applicable

Climate change: Not Applicable

Describe any likely impacts on the Natura 2000 site as a whole in terms of: Interference with the key relationships that define the structure of the site; No predicted likely impact on the conservation functions of any Natura 2000 sites. Interference with key relationships that define the function of the site; No predicted likely impact on the conservation functions of any Natura 2000 sites.

Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss; Not applicable Fragmentation; Not applicable. Disruption; Not applicable. Disturbance; Not applicable. Change to key elements of the site (e.g. water quality etc); Not applicable

Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts are not known. No predicted likely impact on the conservation functions of any Natura 2000 sites

Finding Of No Significant Effects Matrix

Name of Project or Plan:	The implementation of the proposed draft Noise Action Plan relating to The Assessment & Management of Environmental Noise 2018-2023, will provide an overview of regulation, review the results of the latest strategic noise maps for Dún Laoghaire-Rathdown County Council and sets out an approach to the strategic management and control of environmental noise over the next five years
Name and location of Natura 2000 sites:	Natura 2000 sites within the Action Plans area and in the wider vicinity are provided in the 'Introduction' above.
Description of the Project or Plan	As provided in the screening matrix above.
Is the Project or Plan directly connected with or necessary to the management of the site (provide details)?	No

Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	The proposed draft Noise Action Plan provides for sustainable development in accordance with the Dún Laoghaire-Rathdown County Development Plan 2016-2022 and the principles of proper planning and development. The draft Noise Action Plan will form part of the Dublin Agglomeration Plan which will be an amalgamation of individual action plans for the 4 local authorities in the Dublin region. It is not considered that the amalgamation of the four action plans which individually have no impact on any Natura 2000 site will in combination have any negative impact on any Natura 2000 site. Therefore it is not predicted that that the proposal will have any impact on the conservation function of any Natura 2000 site.
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The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 sites:	No predicted likely impact on the conservation functions of any Natura 2000 sites.
Explain why these effects are not considered significant:	The draft Noise Action Plan provides for the sustainable development in accordance with the Dún Laoghaire-Rathdown County Development Plan 2016-2022 and the principles of proper planning and development. It is not predicted that that the proposal will have any potential impact on the conservation function of any Natura 2000 site.
List of Agencies Consulted: Provide contact name and telephone or email address:	
Response to Consultation	

Data Collected to Carry out the Assessment	
Who carried out the Assessment?	
Sources of Data	Existing Data
Level of Assessment Completed	Desktop Study

Where can the full results of the assessment be accessed and viewed	This document contains the full results of the Appropriate Assessment Screening exercise and will be placed on display in the Appendix of the draft Action Plan during the public consultation period for the draft Action Plan.
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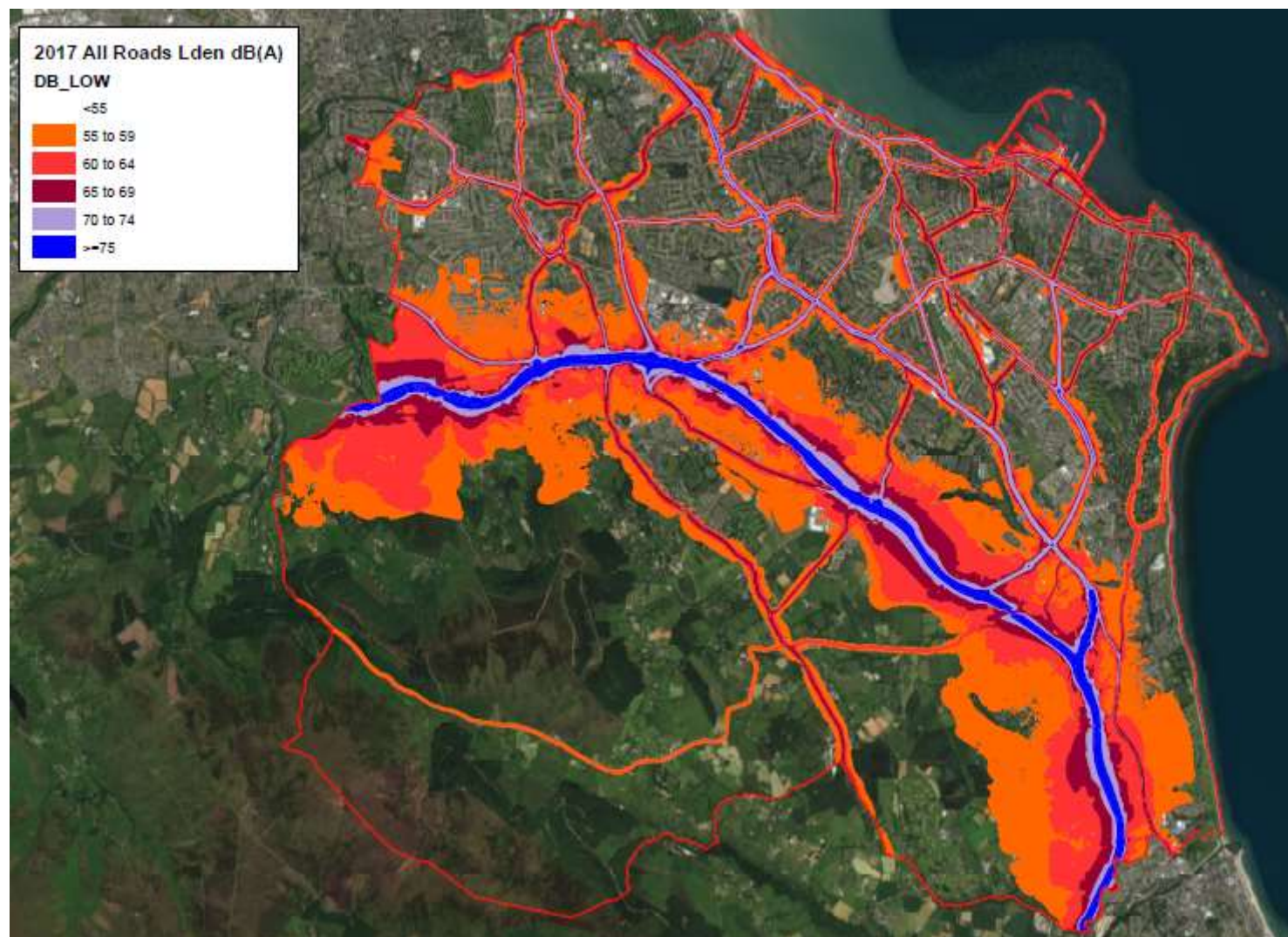
Overall Conclusion	The proposed draft Noise Action Plan relating to 'The Assessment & Management of Environmental Noise' does not significantly alter any policy or objective of the Dún Laoghaire-Rathdown County Development Plan or any other plans adopted by Dún Laoghaire-Rathdown Council. However, in line with the precautionary principle, it is considered appropriate to undertake an appropriate assessment screening. Stage 1 screening indicates that implementing the proposed draft Noise Action Plan is not directly connected with, or necessary to the conservation management of the Natura 2000 in the assessment; The implementation of the Action Plan will not have a direct impact on the Natura 2000 sites considered in the assessment; The project, alone or in combination with other projects or plans, is not likely to have a significant effect on the Natura sites considered in the assessment in view of their conservation objectives and will not have any significant cumulative, direct or indirect impacts upon any of the Natura 2000 sites. Therefore it is not considered necessary to undertake any further stages of the Appropriate Assessment process.
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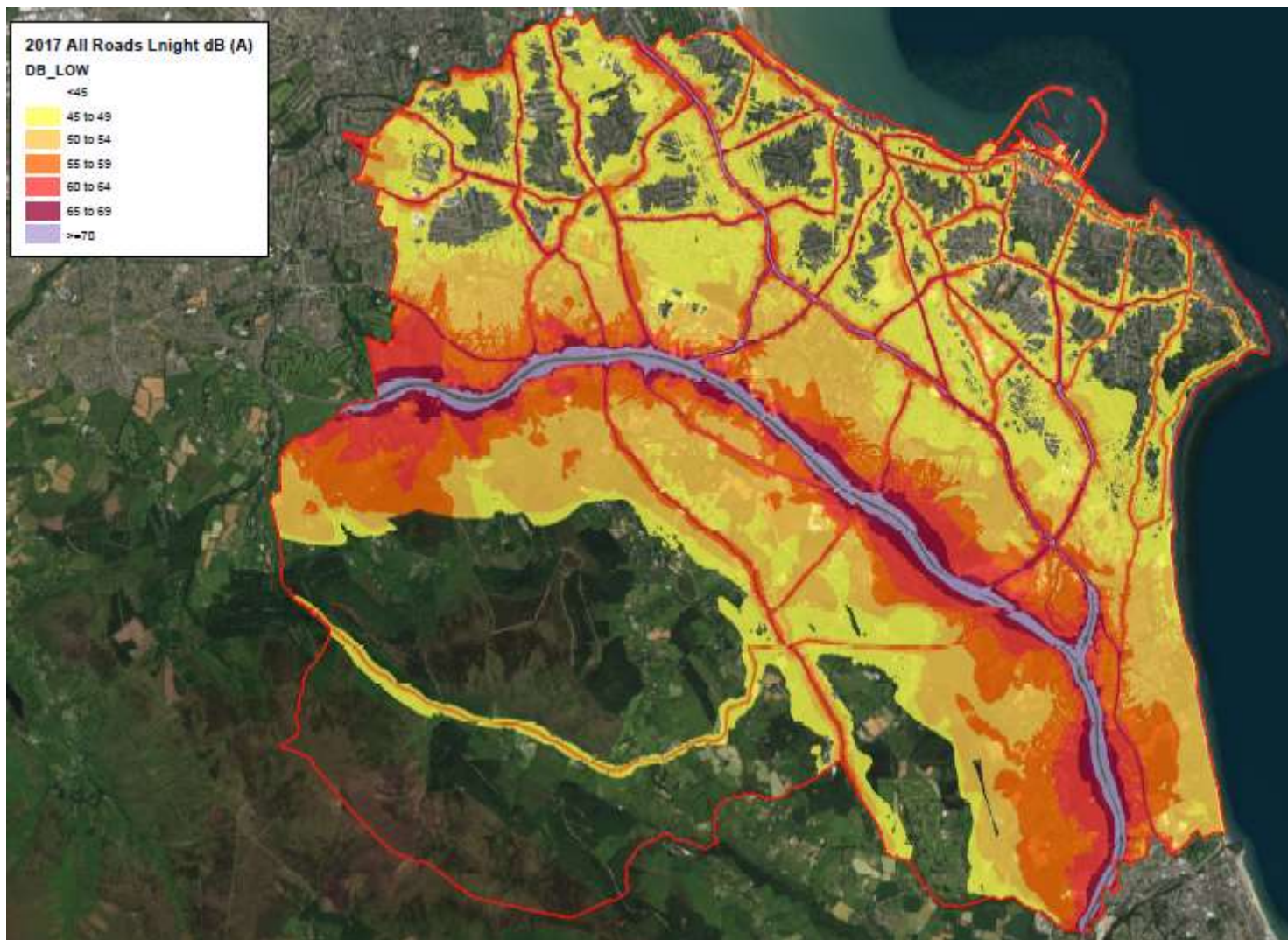
Appendix - E

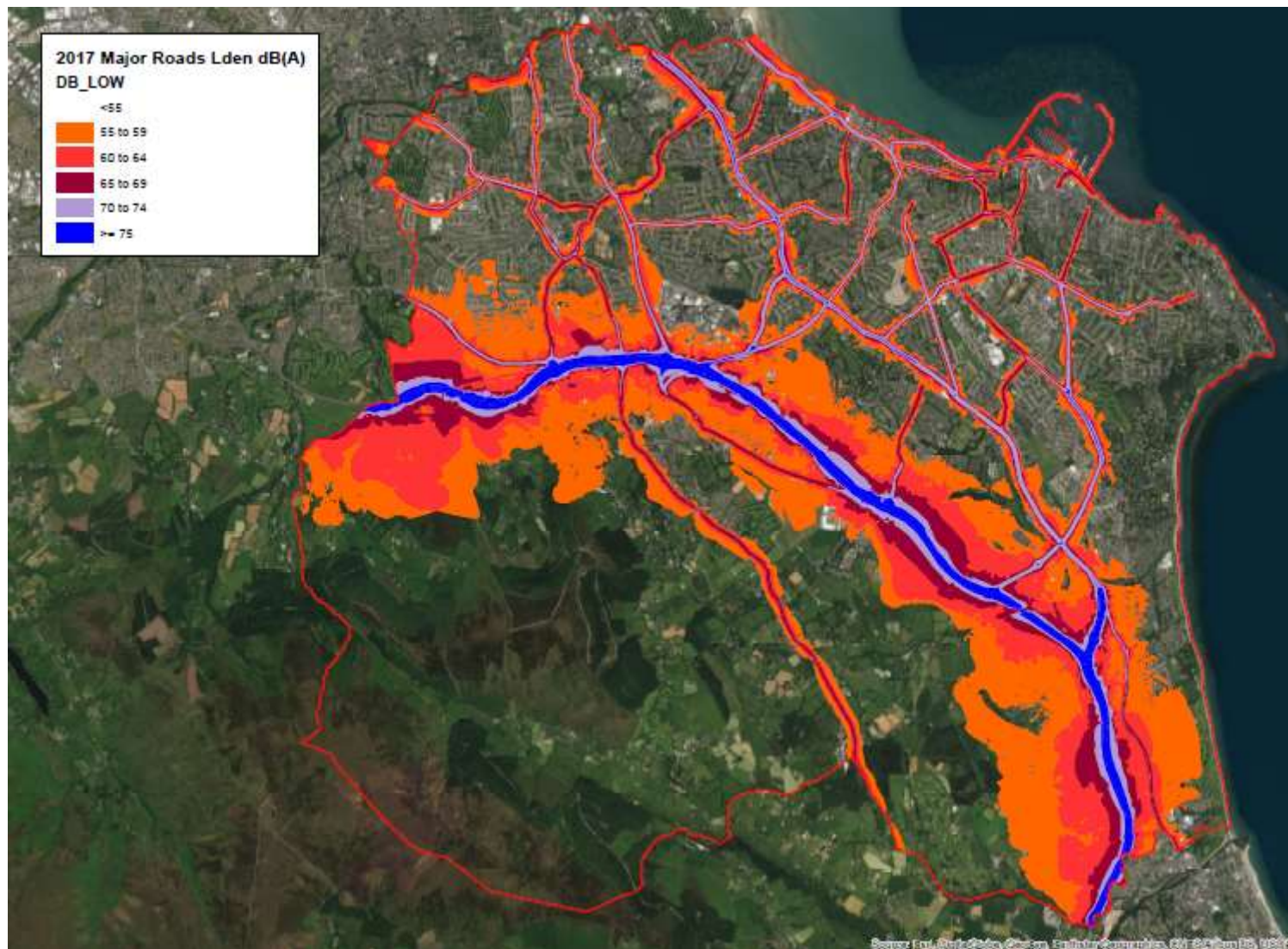
DLRCC – Noise Exposure Tables and Maps

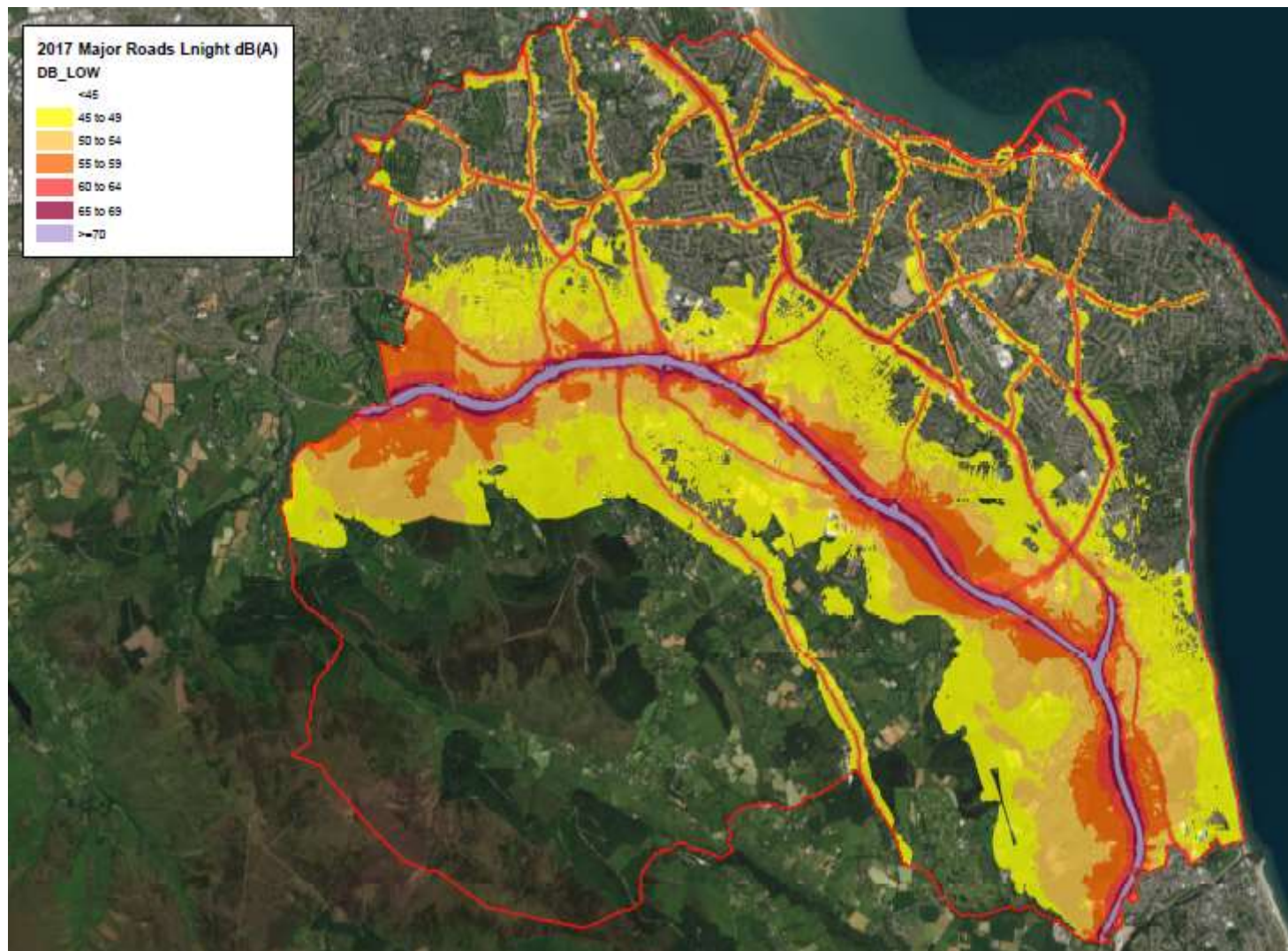
Table 1.0: Sound Emissions from All Road and Major Roads within DLRCC

Element	Data	ALL ROAD	MAJOR ROAD		ALL ROAD	MAJOR ROAD
Lden<55	Number of people in dwellings Lden <55dB	137600	144300			
Lden55-59	Number of people in dwellings Lden 55-59dB	33300	31600	People>55	80400	73700
Lden60-64	Number of people in dwellings Lden 60-64dB	22500	19200			
Lden65-69	Number of people in dwellings Lden 65-69dB	19200	17800	People>65	24600	22900
Lden70-74	Number of people in dwellings Lden 70-74dB	4300	4200			
Lden75	Number of people in dwellings Lden >75dB	1100	900	People>75	1100	900
Ln timer<50	Number of people in dwellings Ln timer 50-54dB	157800	163100			
Ln timer55-59	Number of people in dwellings Ln timer 55-59dB	28400	25300	People>50	60200	54900
Ln timer60-64	Number of people in dwellings Ln timer 60-64dB	23700	21700			
Ln timer65-69	Number of people in dwellings Ln timer 65-69dB	5700	5600	People>60	8100	7900
Ln timer70	Number of people in dwellings Ln timer >70dB	2100	2000			
AreaLden<55	Area in km2 Lden <55dB	300	300	People>70	300	300
AreaLden55-59	Area in km2 Lden 55-59dB	83	87			
AreaLden60-64	Area in km2 Lden 60-64dB	19	18	Area>55	44	40
AreaLden65-69	Area in km2 Lden 65-69dB	12	11			
AreaLden70-74	Area in km2 Lden 70-74dB	7	6	Area>65	13	11
AreaLden75	Area in km2 Lden >75dB	4	3			
DwellingsLden<55	Number of dwellings Lden <55dB	2	2	Area>75	2	2
DwellingsLden55-59	Number of dwellings Lden 55-59dB	54200	57100			
DwellingsLden60-64	Number of dwellings Lden 60-64dB	13300	12600	Dwellings>55	33500	30600
DwellingsLden65-69	Number of dwellings Lden 65-69dB	9500	8100			
DwellingsLden70-74	Number of dwellings Lden 70-74dB	8300	7700	Dwellings>65	10700	9900
DwellingsLden75	Number of dwellings Lden >75dB	1900	1900			
		500	300	Dwellings>75	500	300









Irish Rail – Noise Exposure Tables

Table 2.0: Sound Emissions from Iarnród Éireann Major Heavy Rail in DLRCC Area

Major Rail Sources Dún Laoghaire - Rathdown in dB(A)	Lden 24Hr Major Rail Values	Lday Day Major Rail Values	Levening Evening Major Rail Values	Lnight Night Major Rail Values	No. Of QFs Major Rail QF	Lden QF No of People with Quiet Façade(QF) Major Rail	Lnight QF No of People with Quiet Façade Major Rail	Lden Area Area Exposed Major Rail	No. of Dwellings Exposed (Lden) Major Rail
0-44	214200	214500	215200	217200	400	800	2000	0	87500
45-49	2000	1900	1500	600	400	700	400	0	900
50-54	1000	800	800	200	200	500	100	0	500
55-59	600	600	400	0	300	400	0	0	300
60-64	200	200	100	0	0	100	0	0	100
65-69	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0
>55	800	700	400	0	300	600	0	0.00	400
>65	0	0	0	0	0	0	0	0.00	0
>=70	0	0	0	0	0	0	0	0.00	0
>=75	0	0	0	0	0	0	0	0.00	0
Total	218000	218000	218000	218000	1300	2500	2500	0.00	89300

Table 3.0: Sound Emissions from Iarnród Éireann All Heavy Rail in DLRCC Area

All Rail Sources Dún Laoghaire - Rathdown in dB(A)	Lden 24Hr All Rail Values	Lday Day All Rail Values	Levening Evening All Rail Values	Lnight Night All Rail Values	No. Of QFs All Rail QF	Lden QF No of People with Quiet Façade(QF) All Rail	Lnight QF No of People with Quiet Façade All Rail	Lden Area Area Exposed All Rail	No. of Dwellings Exposed (Lden) All Rail
0-44	214200	214500	215200	217200	400	800	2000	0	87500
45-49	2000	1900	1500	600	400	700	400	0	900
50-54	1000	800	800	200	200	500	100	0	500
55-59	600	600	400	0	300	400	0	0	300
60-64	200	200	100	0	0	100	0	0	100
65-69	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0
>55	800	700	400	0	300	600	0	0.00	400
>65	0	0	0	0	0	0	0	0.00	0
>=70	0	0	0	0	0	0	0	0.00	0
>=75	0	0	0	0	0	0	0	0.00	0
Total	218000	218000	218000	218000	1300	2500	2500	0.00	89300

Transport Infrastructure Ireland – Luas Noise Exposure Tables and Maps

Table 4.0: Sound Emissions from Transport Infrastructure Ireland All Light Rail within Dublin Agglomeration Area

Major Rail – Luas dBA	L _{DEN}	L _{DAY}	L _{EVENING}	L _{NIGHT}	No. of Quiet Façades (QFs)	No. of people with QF (L _{DEN})	No. of people with QF (L _{NIGHT})	Area Exposed (L _{DEN}) km ²	No. of Dwellings Exposed (L _{DEN})
0-44	1313400	1320100	1323200	1331900	2300	6100	13100		522400
45-49	12800	10400	9000	6000	1900	4300	3300		5400
50-54	8000	6200	5800	6900	1500	3900	5500		3200
55-59	6000	6900	6700	2200	1800	4100	1700		2600
60-64	5400	3200	2300	300	1600	4100	200		2000
65-69	1500	400	300	100	500	1200	100		600
70-74	200	200	100	0	0	100	0		100
>55	13200	10400	9400	2600	3900	9600	1900	3.24	5400
>65	1700	500	400	100	500	1300	100	1.98	700
>=70	300	200	100	0	0	200	0	0.00	100
>=75	100	0	0	0	0	100	0	0.08	0
Total	1347400	1347400	1347400	1347400	9600	23900	23900	5.30	536300

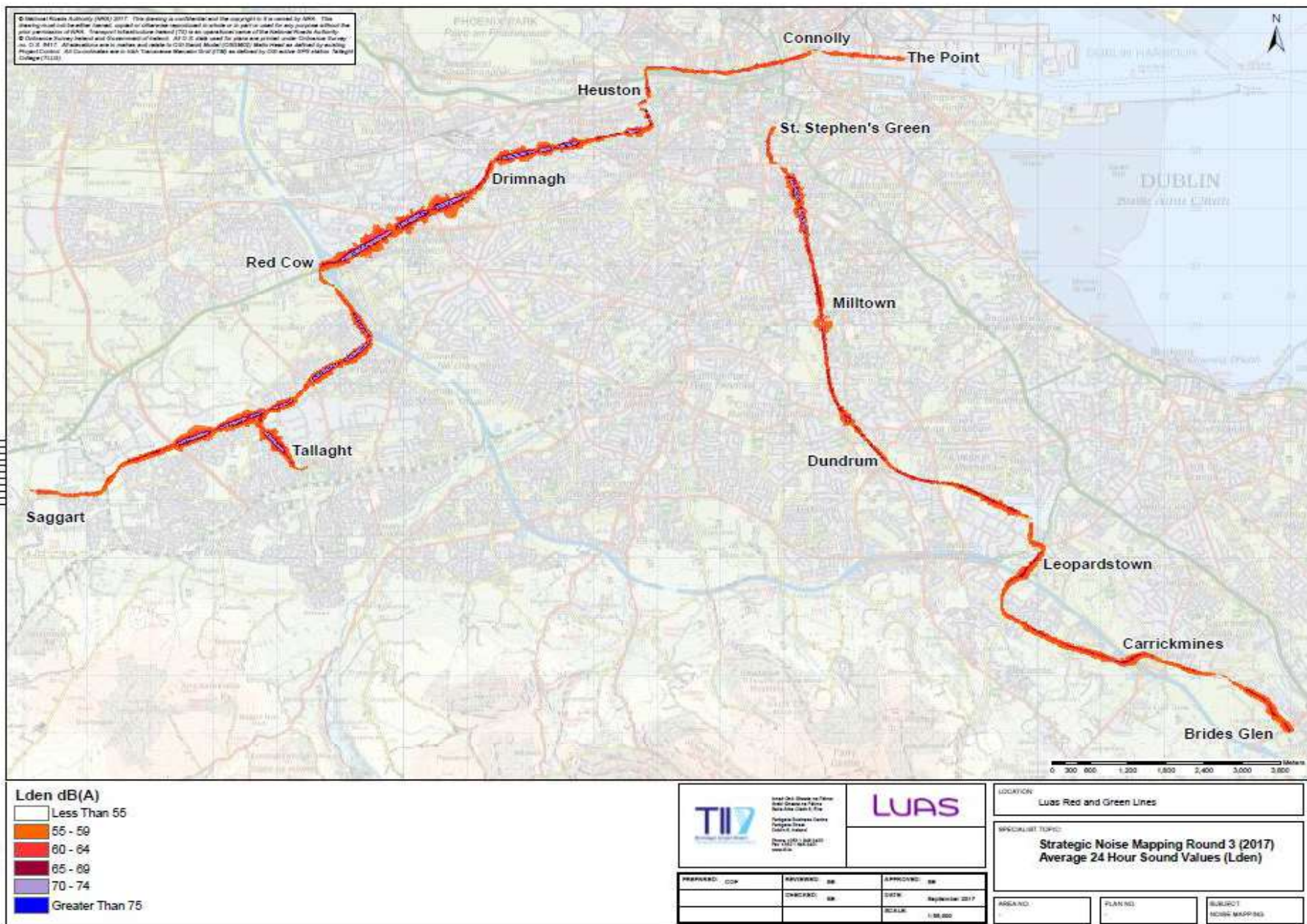
Table 5.0: Sound Emissions from Transport Infrastructure Ireland All Light Rail within DLRCC Area

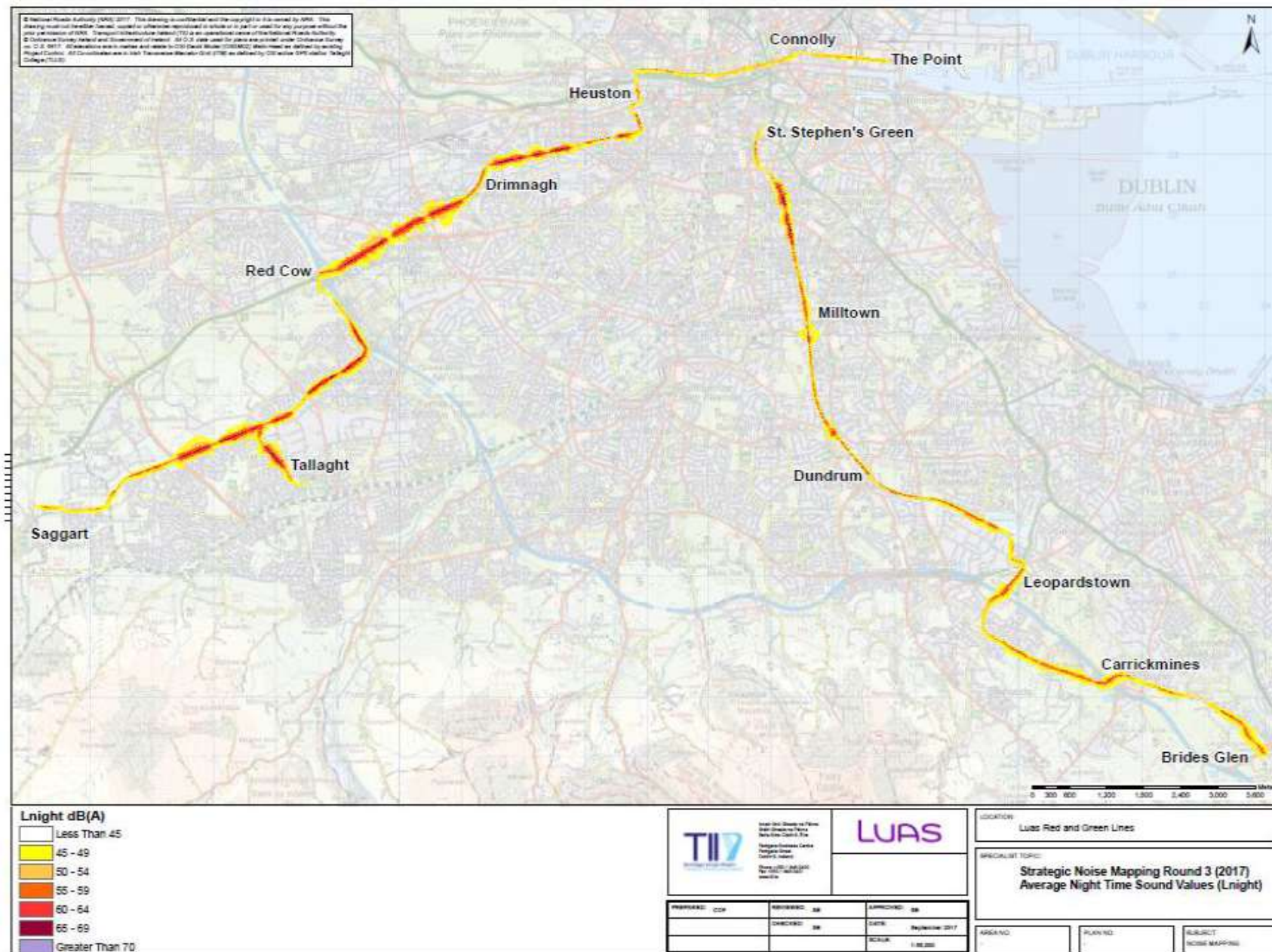
Table 1: L_{den} Noise Exposure levels from Major Rail in DLRCC- Luas

Decibels (dBA)	L_{den} Number of People Exposed	L_{den} % of people exposed 2017	L_{den} % of people exposed 2012
<50	213600	98%	98%
50-54	1300	1%	1%
55-59	2000	1%	1%
60-64	200	0%	0%
65-69	900	0%	0%
>70	0	0%	0%
	218000	100%	100%

Table 2: L_{Night} Noise Exposure levels from Major Rail in DLRCC- Luas

Decibels (dBA)	L_{Night} Number of People Exposed	L_{Night} % of people exposed 2017	L_{Night} % of people exposed 2012
<50	215500	99%	99%
50-54	1500	1%	1%
55-59	1000	0%	0%
60-64	0	0%	0%
65-69	0	0%	0%
>70	0	0%	0%
	218000	100%	100%





Appendix F - Noise Level Bands Colour scheme

The EPA Guidance Note for Noise Action Planning recommends the colour bands outlined below for use in the production of noise level contour maps. The colour bands are based upon those set out within ISO 1996-2 (1987). Furthermore, it is recommended that the colour bands are made semi-transparent such that the base mapping below remains partly visible such that orientation and location remains possible.

Noise Contour Maps

ISO 1996-2 1987 (E)

Noise zone dB	Colour		Code	Red	Green	Blue
Below 35	Light green		# C0 FF C0	192	255	192
35 to 40	Green		# 00 CC 00	0	204	0
40 to 45	Dark green		# 00 50 00	0	80	0
45 to 50	Yellow		# FF FF 00	255	255	0
50 to 55	Ochre		# FF C7 4A	255	199	74
55 to 60	Orange		# FF 66 00	255	102	0
60 to 65	Cinnabar		# FF 33 33	255	51	51
65 to 70	Carmine		# 99 00 33	153	0	51
70 to 75	Lilac red		# AD 9A D6	173	154	214
75 to 80	Blue		# 00 00 FF	0	0	255
80 to 85	Dark blue		# 00 00 66	0	0	102

Appendix G - Noise 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. For this Noise Action Plan it is proposed that the higher the number achieved in the decision matrix process, the higher the priority for action. A value of **17 or more** is suggested as the point where priority action should be considered either to reduce excessive sound levels or to preserve low sound levels where they exist. The decision support matrix recommended by the EPA is set out in Appendix D of the Guidance Note for Noise Action Planning. For the first round of the Environmental Noise Regulations 2006, July 2009.

Table C - Noise Decision Support Matrix

Table C - Noise Decision Support Matrix				
Decision Selection Criteria		Score Range Lden	Score Range Lnight	Subtotal
Noise Band dB(A)	<45	5	6	
	45-49	4	5	
	50-54	3	4	
	55-59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75-79	4	6	
	80+	5	7	
Type of location	City Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	2	2	
	Quiet Area	3	3	
	Recreational open space	2	2	
Type of Noise	Road	3	4	
	Rail	2	3	
	Airport	3	4	
	Industry	2	3	
			Total	

Onset Levels

The aim of the matrix is to help prioritise locations exposed to noise above the EPA recommended onset levels, or below the recommended preservation levels. For road traffic noise, the EPA recommended onset levels, for the assessment of noise mitigation measures are:

- 70 dB, Lden; and 57 dB, Lnight.

The proposed onset levels, for assessment of noise level preservation where they are good, are:

- 55 dB, Lden; and 45 dB, Lnight.