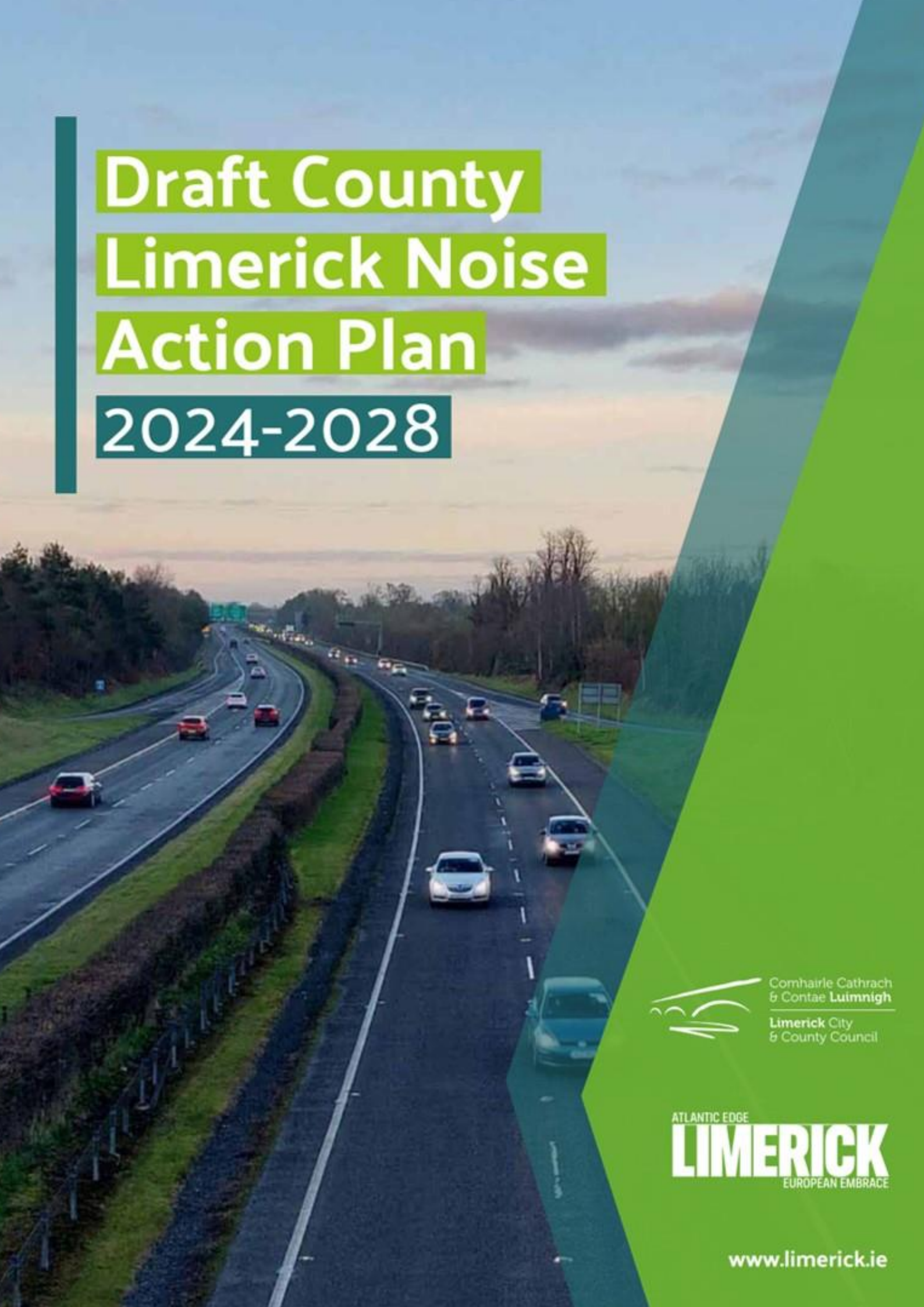
Draft County Limerick Noise Action Plan 2024-2028



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Limerick City & County Council

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Executive Summary

Environmental noise remains a major problem in Europe with at least 20% of the EU population reported by the European Environment Agency in 2020 to be living in areas where noise levels are considered harmful to human health. The long-term exposure to environmental noise significantly effects the physical and mental health of citizens (e.g. annoyance, stress reactions, sleep disturbance, poor mental health and well-being). The major source of noise pollution in both urban and non-urban areas is transportation.

The Environmental Noise Directive ("END") (2002/49/EC) is the main European instrument which has been put in place to manage environmental noise and engage with the public. The END was transposed into Irish Law by the European Communities (Environmental Noise) Regulations 2006, being revised in 2018 and amended in 2021. The Regulations provide a common approach for Action Planning Authorities to avoid, prevent and reduce environmental noise and its harmful effects on a prioritised basis.

This is the fourth round of noise action planning and this Noise Action Plan (2024-2028) reports the findings of the Strategic Noise Mapping for sections of major roads, above a flow threshold of 3 million vehicles per annum, in County Limerick outside of the Agglomeration of Limerick (**Figure 1**), prepared in consultation with Transport Infrastructure Ireland and the Environmental Protection Agency (EPA) in respect of the calendar year 2021.

The Noise Action Plan has been prepared in accordance with the Regulations and is aimed at the strategic long-term management of environmental noise from traffic-related sources. The proposed measures are based on the results of Strategic Noise Maps which have been assessed to estimate the population exposure and harmful effects of noise in the County. The results of the assessment have been used to identify areas that shall be subject to noise management activities during the implementation of the Plan. These areas are referred to as Priority Important Areas. Limerick City and County Council is committed to reviewing the requirement for noise mitigation in the Priority Important Areas within the lifecycle of the Noise Action Plan, including cost-benefit analysis where necessary and determining the reduction in harmful effects where practicable.

Sounds from nature and green spaces (e.g. birds singing, rustling leaves) are known to reduce stress and have a positive impact on our health and well-being. The results of the strategic noise mapping have also been used to identify areas within County Limerick that potentially have low environmental noise levels and are to be considered for protection. These areas are referred to as Candidate Quiet Areas. For the Candidate Quiet Areas an investigation will be undertaken to determine the suitability for designation as Quiet Areas. Where appropriate, proposals for delimiting Candidate Quiet Areas as a Quiet Areas shall be drawn up for submission to the EPA and Minister.

This Noise Action Plan is supported by a four-year programme for implementation, with progress reported to the EPA on an annual basis.

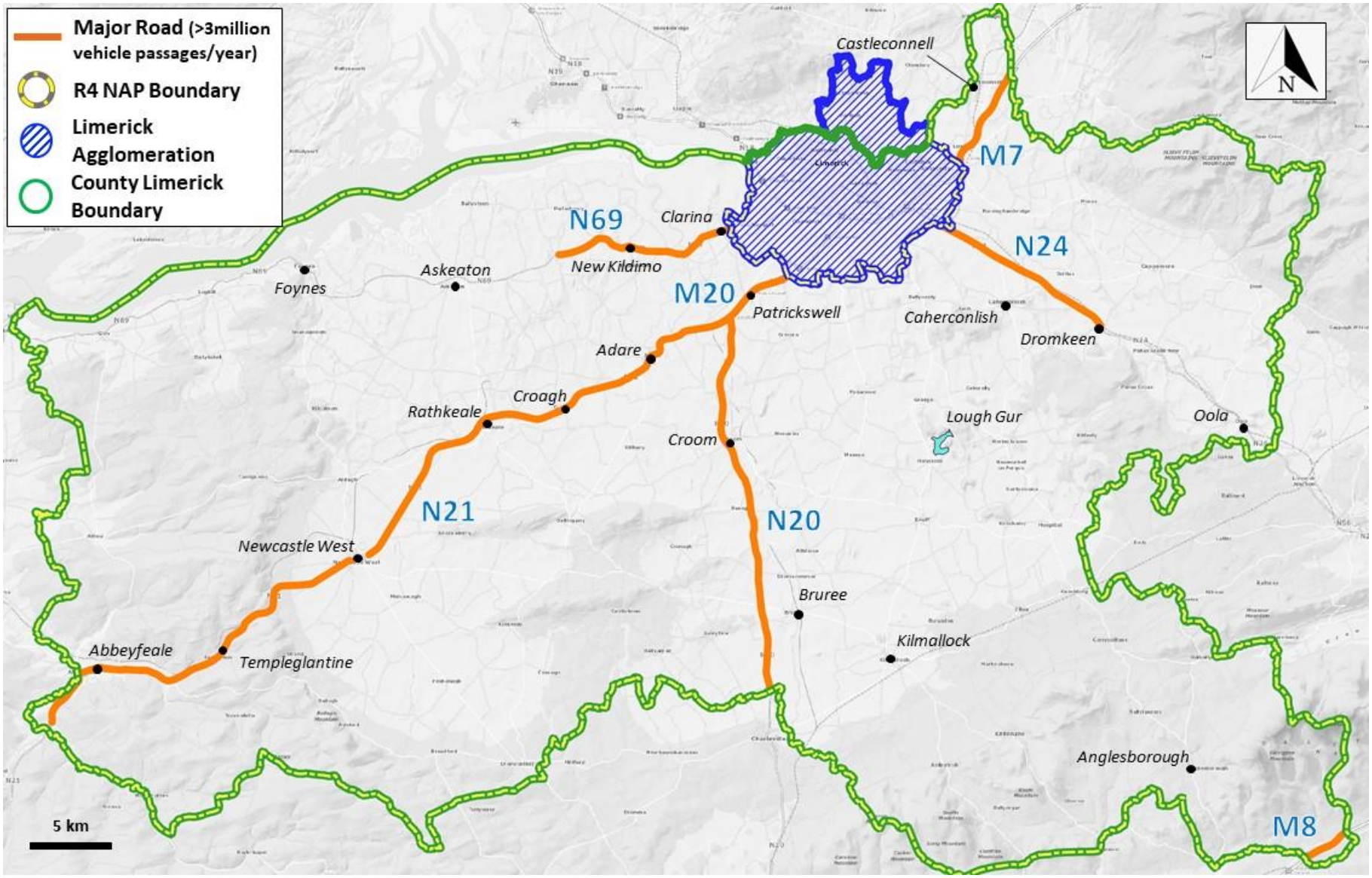


Figure 1. Sections of major roads in County Limerick that qualified for the Round 4 Noise Action Plan 2024-2028.

The Plan is underpinned by a set of overarching noise policy principles outlined in the **Noise Policy Statement**.

Noise Policy Statement

Limerick City and County Council will adopt a strategic approach to managing environmental noise, within its administrative area, and will aim to:

- **Mitigation –** identify appropriate mitigation measures to reduce noise levels where they are potentially harmful to the health of communities.
- **Prevention** - prevent additional members of the community being exposed to undesirable noise levels where it is likely to have a significant adverse impact on health and quality of life, and where practicable, improve or maintain the quality of sound in the public realm.
- **Protection** - protect areas which are desirably quiet, or which offer a sense of tranquillity through a process of identification and validation followed by formal designation of "Quiet Areas".

Contents

1. Introduction

1.1 Purpose of the County Limerick Noise Action Plan

The Environmental Noise Directive ("END") (2002/49/EC) is a European Union legal instrument vital for protecting public health and the environment by addressing the adverse effects of environmental noise. The Directive's main aim is to put in place a European-wide system for identifying sources of environmental noise pollution, informing the public about relevant noise data and then taking the necessary steps to avoid, prevent or reduce noise exposure. The basic principles and requirements of the END can be summarised as discussed below. A glossary of terms can be found in **Appendix A**.

The END was transposed into Irish Law by the European Communities (Environmental Noise) Regulations 2006 (S.I. 140/2006)[1] (the "Regulations"). The Regulations were revised by the European Communities (Environmental Noise) Regulations 2018[2] (S.I. 549/2018) and amended through the European Communities (Environmental Noise) (Amendment) Regulations 2021 (S.I. 663/2021). These regulations are commonly referred to as the Environmental Noise Regulations.

The END does not set any limit values or prescribe noise management measures to fulfil its aims. Through the establishment of noise regulations, the preparation of Strategic Noise Maps and implementation of Noise Action Plans (herein termed "NAPs"), the END strives to raise public awareness, prevent and reduce environmental noise, and preserve environmental noise quality in areas where it is good.

In Ireland, it is recommended that the NAPs support Policy Objective 65 from the National Planning Framework 2040[3], which states:

"Promote the pro-active management of noise where it is likely to 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."

The County Limerick NAP, and its subsequent implementation, is critical to ensuring that Limerick City and County Council (herein termed the "Council") achieves the aims and objectives of the END, compliance with national policy and to address local environmental noise issues.

1.1.1 Roles and Responsibilities

The Environmental Noise Regulations designate the Environmental Protection Agency (EPA) as the national authority responsible for overseeing the implementation of the regulations and for reporting information relating to strategic noise mapping and noise action planning to the European Commission in accordance with Article 10(2) of the END.

[1] https://www.irishstatutebook.ie/eli/2006/si/140/made/en/print [Accessed March 2024]
[2] https://www.irishstatutebook.ie/eli/2018/si/549/made/en/print [Accessed March 2024]
[3] National Planning Framework 2040: http://www.gov.ie/en/project-ireland-2040/ [Accessed March 2024]

The EPA provides guidance ("EPA Guidance"[4]) on the required activities to be undertaken during the implementation of the Regulations. These have been fully accounted for in the preparation of this NAP.

Under the Environmental Noise Regulations, 2018, the following organisations are designated as noise mapping bodies for County Limerick, outside the Agglomeration of Limerick (herein termed the Limerick Agglomeration) for the areas identified in **Appendix B**:

- for major railways (sections with a flow above a threshold of 30,000 train passages per year), Iarnród Éireann or the National Roads Authority (now Transport Infrastructure Ireland), as appropriate, on behalf of the action planning authority or authorities concerned;
- for major roads (sections of road with a flow above a threshold of 3,000,000 vehicle passages per year):
- for major airports, the relevant airport authority, on behalf of the action planning authority or authorities concerned.

Limerick City and County Council is the designated action planning authority for County Limerick, outside the Limerick Agglomeration, and is responsible for preparing this Noise Action Plan 2024-2028. There are no major railways or major airports in County Limerick and so this NAP is only concerned with environmental noise from major roads. The geographic extent of the County Limerick boundary, outside the Limerick Agglomeration, and the sections of major roads that qualified for Round 4 strategic noise mapping and noise action planning are presented in **Figure 1.1**.

1.1.2 Scope of the END

The END is aimed at establishing harmonised EU measures to reduce noise emitted by the major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor industrial equipment and also at providing a basis for developing and complementing the existing set of community measures concerning environmental noise. The END applies to environmental noise to which humans are exposed, in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise sensitive buildings and areas. The END does not apply to noise that is caused by the exposed person themself, noise from domestic activities, neighbourhood noise, noise at work places or noise inside means of transport or due to military activities in military areas. Noise maps are strategic tools and should not be used for the assessment of local noise nuisances.

1.1.3 Strategic Environmental Assessment (SEA) Screening

Strategic Environmental Assessment (SEA) is a formal and systematic process designed to assess the potential significant environmental impacts of implementing a plan or program before deciding to adopt it.

The requirement for SEA for plans and programs is outlined in European Directive 2001/42/EC ("SEA Directive"). In the context of specific land-use plans, this directive is implemented in

[4] EPA Noise Action Planning Guidelines, 2024

Irish law through the Planning and Development (Strategic Environmental Assessment) Regulations, 2004[5] (S. I. 436/2006). This legislation has been amended by the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011[6] (S.I. 201/ 2011). For all other sectorial plans, the SEA Directive is transposed into Irish law by European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004[7] (S. I. 435/2004), as amended by European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011[8] (S. I. 200/2011).

The SEA screening has concluded that no SEA is required.

1.1.4 Appropriate Screening Assessment

The primary purpose of the Directive 92/43/EEC ("Habitats Directive") is to promote the conservation of natural habitats and wild fauna and flora across the European Union. The Habitats Directive is transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011[9] (S. I. 477/2011) ("Habitats Regulations").

The European Environment Agency has designated a network of protected areas ("Natura 2000" sites) covering Europe's most valuable and threatened species and habitats.

The County Limerick NAP has been assessed to determine if it is required to be subject to an 'Appropriate Assessment' ("AA") under the Habitats Directive. The screening assessment has determined that there is no likelihood of a significant impact on a Natura 2000 site. Consequently, there is no need to conduct a 'Stage 2 AA' for the purposes outlined in Article 6(3) of the Habitat Regulations.

1.2 Scope of the County Limerick NAP

The Council is responsible for the making and approval of this NAP, in consultation with the EPA and TII. NAPs must satisfy the minimum requirements set out in the Fourth Schedule of the Environmental Noise Regulations 2018.

The Environmental Noise Regulations require the strategic noise mapping to be based upon the assessment year of 2021. However, due to COVID-19 related travel restrictions and the operational impacts of the pandemic, noise contour results for 2021 may not be fully representative. Due to the nature of the decibel scale, a halving of road or rail traffic would result in a three-decibel decrease in noise levels, which would not normally be a perceivable reduction in noise. As rail and road traffic travel reductions did not generally reduce by these magnitudes, the use of the 2021 assessment year is deemed representative for the purpose of the Round 4 action planning.

[5] https://www.irishstatutebook.ie/eli/2004/si/436/made/en/print [Accessed March 2024]
[6] https://www.irishstatutebook.ie/eli/2011/si/201/made/en/pdf [Accessed March 2024]
[7] S.I. No. 435/2004 - European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (irishstatutebook.ie) [Accessed March 2024]
[8] S.I. No. 200/2011 - European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011. (irishstatutebook.ie) [Accessed March 2024]
[9]https://www.irishstatutebook.ie/eli/2011/si/477/made/en/print [Accessed March 2024]

The previous three rounds of strategic road noise mapping for Limerick has used an 'interim' assessment method, CRTN 1988[10]. For the fourth round of noise mapping a common noise assessment method has been implemented (Common Noise Assessment Methods in Europe, CNOSSOS-EU[11]) in line with Annex II of the Directive which was revised by the mandatory EU Directive 2015/996 and brought into effect through the Environmental Noise Regulations, 2018. This change in methodology makes any direct comparison of the Round 4 noise exposure statistics with the previous three rounds methodologically complex and inaccurate. For the noise action planning process, the Environmental Noise Regulations require that each NAP shall address priorities which "*may be identified on the basis of any noise limit value or criteria established by the EPA*" and "*in the first instance, address the most important area or areas, as the case may be, established by strategic noise mapping*" [12].

This NAP therefore includes the identification of existing noise emissions, the identification of priority important areas based on an assessment of harmful effects and details of noise management measures for consideration and evaluation at implementation stage. The NAP also includes the identification of Candidate Quiet Areas for consideration as Quiet Areas at the implementation stage.

1.3 Noise Indicators

The Environmental Noise Regulations specify two main noise indicators which must be used in the preparation of the Strategic Noise Maps:

- L_{den} – the annual average noise level for the day, evening and night periods and is designed to indicate overall annoyance; and
- L_{night} – the annual average noise level for the night-time periods, from 23:00 – 07:00 hours, and is designed to indicate sleep disturbance.

1.4 Structure of the NAP

The first part of the NAP covers the overarching principles of the noise action planning process, including the legal context, and a review of the measures relevant to County Limerick under the Round 3 NAP (2018-2023). This is followed by a summary of the strategic noise mapping with an evaluation of the estimated number of people exposed to environmental noise above levels required to be reported under the END and an assessment of the harmful effects.

The NAP includes identification of the specific areas within County Limerick to be considered for noise mitigation, with the suite of potential measures, or to be candidate areas for the preservation of environmental noise quality, where environmental noise levels are expected to be low. Progress of implementation of the NAP will be tracked through annual reporting to the EPA.

[10] Department of Transport (UK), Calculation of Road Traffic Noise (CRTN), HMSO, 1988
[11] https://op.europa.eu/en/publication-detail/-/publication/80bca144-bd3a-46fb-8beb-47e16ab603db [Accessed March 2024]
[12] Section 12(2) of the Environmental Noise Regulations 2018.

1.5 Round 4 Timelines

A timetable of the key activities for the development and implementation of the NAPs for Round 4, and delivery to the European Environment Agency (EEA) by the Authority, is set out below:

- Q1 2024: Prepare draft NAPs;
- 5 April to 17 May 2024: Public consultation for County Limerick (6 weeks);
- 18 July 2024: Deadline for submission to the EPA;
- 18 August 2024: Deadline for publishing NAPs;
- 18 August 2024: A summary of the NAPs to be submitted to the EPA;
- 18 January 2025: NAPs to be reported to the EEA by the EPA.

1.6 Public Consultation

As part of the consultation process noise action planning authorities are required to ensure that:

- the public are consulted on proposals included in the NAPs;
- the public are given early and effective opportunities to participate in the preparation and review of NAPs;
- the results of public participation are considered in finalising or reviews of the NAPs;
- the public are informed of the decisions taken in relation to the NAPs; and
- reasonable timeframes are adopted to allow sufficient time for each stage of public participation.

1.7 Acknowledgements

The background mapping used in the figures presented in this report are taken from Tailte Éireann (© Tailte Éireann Surveying, data reproduced under Licence number CYAL50380258) and OpenStreetMap (© OpenStreetMap contributors. See: https://www.openstreetmap.org/copyright).

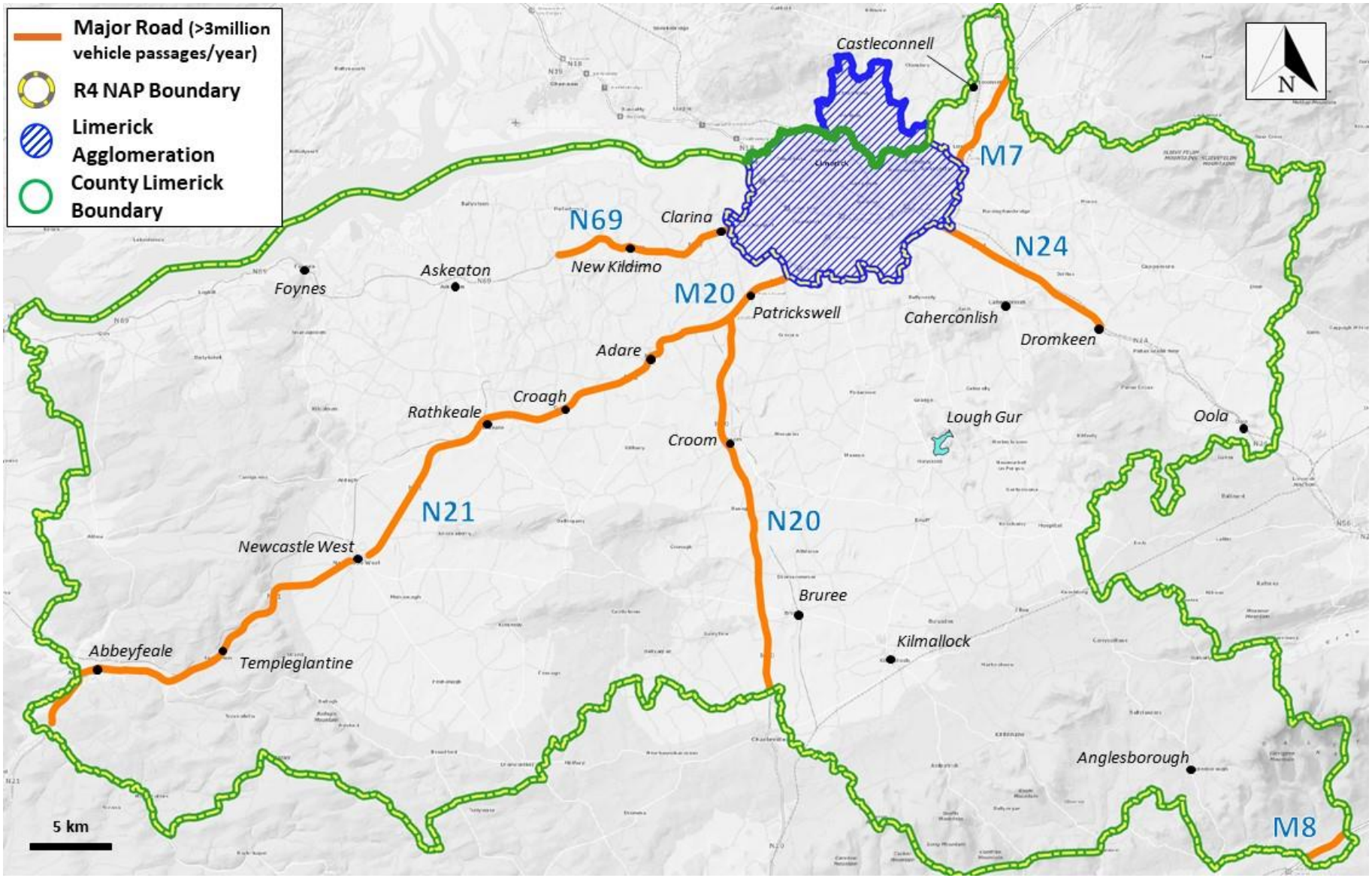
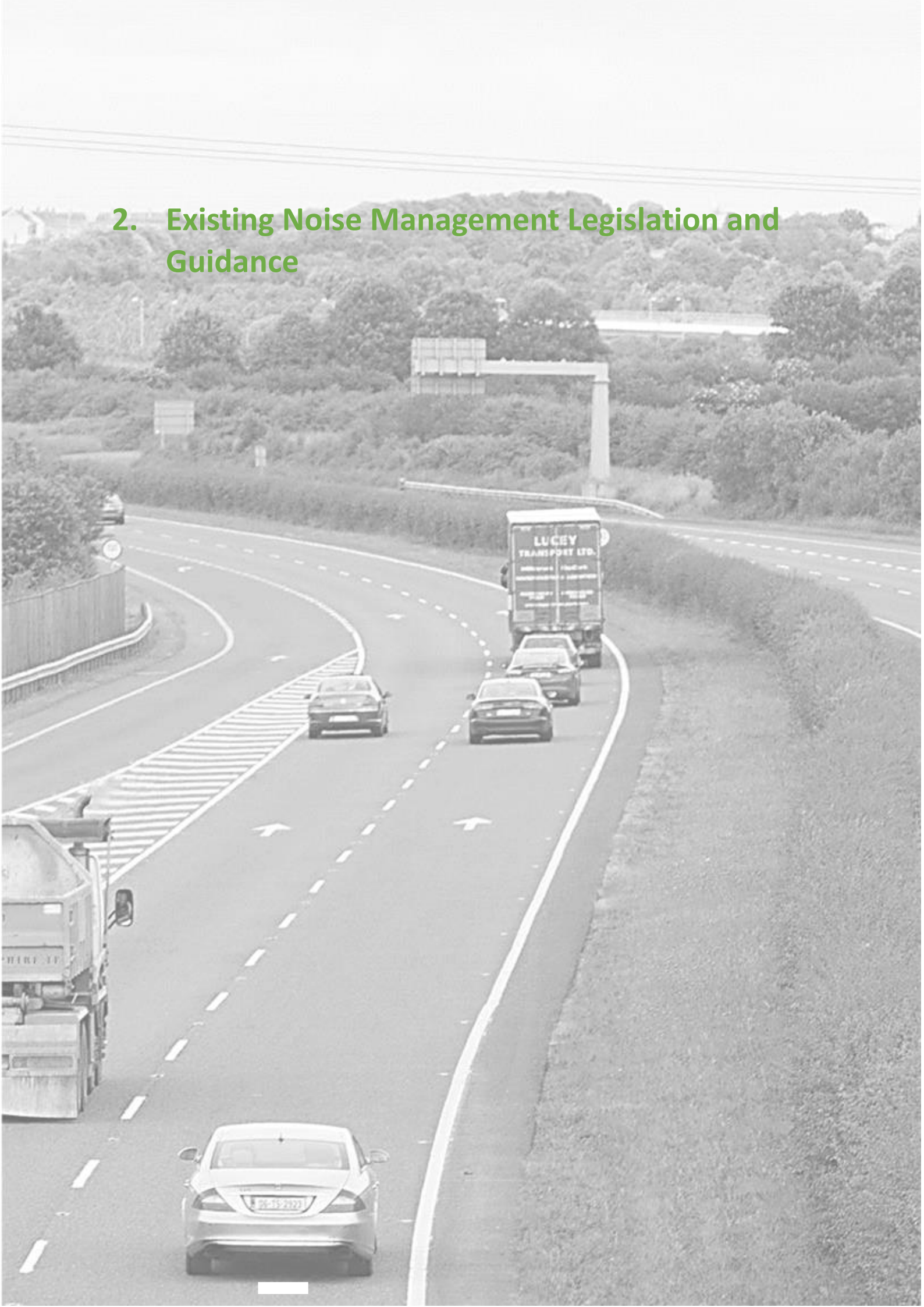


Figure 1.1. Sections of major roads in County Limerick qualified for the Round 4 Noise Action Plan (R4 NAP) 2024-2028.

2. Existing Noise Management Legislation and Guidance



2.1 Introduction

EPA Guidance provides support to the Action Planning Authorities for the preparation of NAPs. This guidance takes cognisance of existing international, European and national legislation and is reviewed below along with regional and local strategies, policies and objectives that support the development of the Round 4 NAPs (**Figure 2.1**).

2.2 Noise and Human Health

The World Health Organization (WHO) in its publication 'Environmental Noise Guidelines for the European Region 2018'[13] (ENG) has presented several key adverse health outcomes from environmental noise including:

- Noise annoyance;
- Sleep disturbance;
- Cardiovascular health;
- Mental health and well-being;
- Cognitive impairment.

These negative health outcomes have been summarised by the European Environment Agency (EEA) in the Environmental Noise in Europe – 2020 report. The EEA outline significant public health impacts with the long-term exposure to environmental noise estimated to cause 22 million people suffering chronic high annoyance, 6.5 million people suffering from chronic high sleep disturbance, 48,000 new cases of ischaemic heart disease per year and 12,000 premature deaths in Europe[14].

The ENG provide recommendations for protecting human health from exposure to noise originating from various sources including road traffic, railway and aircraft. The recommendations include guideline values using L_{den} and L_{night} metrics in terms of the onset of health effects. However, no single noise metric best correlates with all adverse health outcomes associated with environmental noise effects, and health effects can be correlated with more than one metric. The noise metrics which are generally considered to best correlate with the different health effects, and are the subject of this NAP, are set out in **Table 2.1**.

Table 2.1. Noise metrics and the associated health effects.

Noise Metric	Health Effects
L_{den}	Cardiovascular disease, Cognitive impairment, and Annoyance
L_{dn}	Annoyance

The values recommended not to be exceeded in the ENG regarding road noise, above which the onset of health effects are observed in the population and which the WHO strongly recommend that policy-makers reduce the populations exposure below are:

[13] Environmental Noise Guidelines for the European Region, World Health Organisation, 2018
[14] Environmental Noise in Europe – 2020, EEA Report 22/2019

- 53 dB L_{den} and 45 dB L_{night}.

The basis of these recommendations has informed the required methods for the assessment of health effects of noise (ischaemic heart disease, high annoyance and high sleep disturbance) in the Environmental Noise (Amendment) Regulations 2021 for noise action planning.

Subsequently, the European Commission (EC) has adopted the Zero Pollution Action Plan (ZPAP)[15] (2021). 'Vision for 2050' under the ZPAP includes key targets for noise by 2030 - that is reducing the share of people chronically disturbed by transport noise by 30%. This is a target that may be introduced into Irish legislation in the future and need to be considered in future iterations of NAPs.

2.3 Noise and the Environment

The Strategic Environmental Assessment (SEA) Directive requires that an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment, including noise. For certain public and private projects the Environmental Impact Assessment (EIA) Directive mandates that where there is the potential for significant environmental noise effects then they must undergo a thorough evaluation and while the Habitats Directive does not have explicit requirements in relation to noise there is an underlying goal of conserving biodiversity and protecting ecosystems from the adverse effects of noise pollution. The Planning and Development (Strategic Environmental Assessment) Regulations, 2004 (S. I. 436/2006)[16], EC (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S. I. 435/2004)[17] and EC (Birds and Natural Habitats) Regulations 2011 (S. I. 477/2011)[18] implement the relevant environmental Directives into Irish law.

2.4 Noise and Statutory Provisions

The Environmental Protection Agency Act, 1992[19], is not related to the making of NAPs but includes national legislation regarding environmental noise with statutory provisions relating to the control of environmental noise which may give rise to nuisance or loss of private amenity, constitute a danger to health, or damage property.

With regards to noise, Section 106 to 108 are most relevant:

- 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 power to local authorities or the Agency to serve notice requiring measures to be taken to prevent or limit noise from any premises, processes or works; and

[15] EU Action Plan: Towards a Zero Pollution for Air, Water and Soil, 2021
[16] https://www.irishstatutebook.ie/eli/2004/si/436/made/en/print [Accessed March 2024]
[17] https://www.irishstatutebook.ie/eli/2004/si/435/made/en/print [Accessed March 2024]
[18] https://www.irishstatutebook.ie/eli/2011/si/477/made/en/print [Accessed March 2024]
[19] https://www.irishstatutebook.ie/eli/1992/act/7/enacted/en/print [Accessed March 2024]

- Section 108 sets out a process whereby noise issues may be taken to District County, which may make any order requiring that the person or body responsible for the noise to take measures for the prevention or limitation of the noise in question.

The Act also requires that certain bodies must limit environmental pollution caused by industrial activities to obtain a license to operate (Integrated Pollution Prevention Control (IPPC) Licensing). The activities to which a licence applies are provided in First Schedule of the Act (as amended).

2.5 Noise and Transportation

The EC Phenomena Project, 2021[20] has reviewed the potential impact of measures capable of delivering significant reductions of health burden (20% to 50%) arising from environmental noise related to roads, railways and aircraft, and to assess how relevant noise related legislation could increase the implementation of the most effective measures. For road noise, the measures considered in the project included low noise road pavements, low noise zones (speed reductions) and new legislation at an EU level for a low noise tyre fleet. The analysis found that a combination of all road noise abatement measures can achieve a health burden reduction by 2030 in the range 18% to 24%.

In Ireland the Roads Act, 1993[21] (revised 2023[22]), outlines the responsibilities of the roads authorities for the maintenance and construction of public roads. Under section 77 of the Roads Act 1993, power had been given to the Minister to make regulations requiring relevant road authorities to take measures to mitigate the effects of road traffic noise and to specify limits for road traffic noise which, if exceeded, would require mitigating action from the road authorities. However, Section 77 was repealed under the Public Transport Regulation Act, 2009[23]. There are no Irish statutory noise limits or standards governing road traffic noise for new or existing roads.

The National Roads Authority (NRA) published the 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (2004[24], revised by TII in 2014[25]). The guidelines provide design goals for noise related to both the construction and operational stages of new road schemes. For the operational stage there is a recommended design goal of $L_{den} \leq 60$ dB free field value. Any proposed new road scheme must take into account the design goal for any existing dwellings likely to be effected. The TII guidelines present an approach to mitigating the adverse effects of noise from national road schemes in so far as possible using measures such as alignment changes, barriers, use of low noise road pavements. The responsibility for developing noise mitigation policies relating to any proposed new noise sensitive developments near existing or planned road schemes lies with the relevant planning authority.

[20] European Commission Assessment of Potential Health Benefits of Noise Abatement Measures in the EU (Phenomena Project), 2021
[21] https://revisedacts.lawreform.ie/eli/1993/act/14/revised/en/html [Accessed March 2024]
[22] https://revisedacts.lawreform.ie/eli/1993/act/14/revised/en/html [Accessed March 2024]
[23] https://www.irishstatutebook.ie/eli/2009/act/37/enacted/en/print [Accessed March 2024]
[24] Guidelines for the Treatment of Noise and Vibration in National Road Schemes, NRA, 2004
[25] Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, TII, 2014

National Roads 2040[26] (NR2040) is TII's long-term strategy for planning, operating, and maintaining the National Roads network. The strategy has been developed to support the delivery of National Planning Framework 2040[27] objectives and to align with the Department of Transport's National Investment Framework for Transport in Ireland. One of the key visions in the strategy is that the national road network should be environmentally sustainable:

"Environmental sustainability is the bedrock for social and economic sustainability in Ireland; avoiding and where unavoidable mitigating environmental impacts including climate change, air quality and noise as well as biodiversity impacts of National Roads."

Many of the issues in the strategy surround decarbonisation and the need to reduce greenhouse gas and carbon emissions, as set out in the Climate Action Plan 2023[28] and provide potential opportunities for mutual gains for noise reduction (e.g. through active travel, integrated mobility, maintenance and improvement works on the national road network, switch towards electric private vehicles). However, while there is general support for the mitigation of transport-related noise in NR2040 there is no national funding mechanism available to implement abatement measures where they might be recommended through NAPs.

The National Speed Limit Review, led by the Department of Transport, was published in September 2023, in accordance with Ireland's Government Road Safety Strategy, 2021 - 2030[29]. Any introduction of the proposed recommendations - although not its primary goal - might have the effect of reducing road noise levels. The key recommendation is that for built-up and urban areas that a default speed limit of 30 km/h be introduced. A 30 km/h limit should apply, for all urban centres, residential roads and locations where there is a significant presence of vulnerable/active road users. There are exceptions to the recommendation (e.g. pedestrian zones and shared spaces/zones where a speed limit of 20 km/h would apply, 50 km/h for national, regional, arterial roads and key public transport routes etc.). It is recommended that default speed limits remain the same on the rural road network except for National Secondary Roads where it is recommended that the default Speed Limit be reduced from 100 km/h to 80 km/h and local roads where it is recommended that the default speed limit be reduced from 80 km/h to 60 km/h. There are a number of specific recommendations on the applications of speed limits for particular circumstances such as Cycle Streets (Urban), School Speed Zones, Urban Shared Spaces/Zones, Pedestrian Zones, Slow Zones, Quiet Lanes etc. Work has commenced by the Department of Transport to review the existing guidelines for managing and setting speed limits and it is envisaged that legislation to implement recommendations shall be introduced in 2024.

The Mid-West Area Strategic Plan 2012-2030[30] seeks to reduce car dependency and supports the provision of high-quality active travel routes linking residential, commercial and

[26] National Roads 2040, TII, 2023
[27] National Planning Framework – Ireland 2040 Our Plan, Department for Housing, Local Government and Heritage, 2018
[28] Climate Action Plan 2023, Department of Environment, Climate and Communications, 2022
[29] Ireland's Government Road Safety Strategy (2021 - 2030) - Our Journey Towards Vision Zero
[30] Mid-West Area Strategic Plan 2012-2030: Planning, Land Use and Transportation Strategy, Mid-West Regional Authority, 2013

employment areas throughout Limerick and the Mid-West Region. Similarly, the Limerick Shannon Metropolitan Area Transport Strategy[31] (LSMATS), prepared by the National Transport Authority (NTA), and which covers the area of this NAP out towards Clarina and Castleconnell, focuses on reducing car dependency within the city, thereby alleviating issues such as poor public health and reduced air quality, with mutual gains for noise reduction.

An objective of the Limerick Development Plan 2022-2028[32] (LDP) is to facilitate the implementation of the LSMATS (Objective TR O5). The LSMATS combines land use and transport planning to discourage private vehicle use and prioritise walking, cycling and public transport. The LDP also has supporting objectives to provide park and ride ('and stride') facilities (TR O18 and TR O19, respectively), support car sharing (TRO20) and a switch to electric vehicles and bikes and compressed natural gas vehicles (TR O21).

The LDP recognises that green corridors and greenways have an important role in supporting and promoting active travel such as walking and cycling and the LDP supports objectives contained in Our Rural Future: Government's Blueprint to Transport in Rural Ireland (TR P9) with the potential for walking and cycling within and between rural towns and villages. The LDP also supports the need for an improved public transport service in rural areas and to facilitate the ongoing review and enhancements to inter-city, regional and commuter services in conjunction with the NTA (TR P9, TR P10, TR O25). Transitioning towards sustainable modes of travel is also a key objective in the Limerick Draft Climate Action Plan[33].

The LDP also requires that due consideration be given to the identification and designation of Quiet Areas (Objective EH O20) through a process of identification followed by formal designation to protect areas that provide a sense of tranquillity for communities away from transportation noise. The Council's Limerick City and Environs Green and Blue Infrastructure (GBI) Strategy[34] outlines the need to prioritise GBI creation and enhancement schemes in areas where communities are exposed to high transport noise levels. While the GBI Strategy provides objectives for the City and Environs they are also relevant for County Limerick. The consideration of the identification and investigation of Quiet Areas is also relevant to the Council's development of the Limerick Public Realm Strategy[35].

2.6 Noise and Residential Development

The National Planning Framework 2040 recognises the importance of noise management where there is a potential impact on human health and implements aims through NPO 65 (see **Section 1.1**).

Where there are proposals for new residential buildings near major transportation routes then it is the responsibility of the relevant planning authorities to ensure consideration is given to the potential impact of environmental noise for future residents. However, there is no national noise planning guidance to support planning authorities in decision-making. Siting

[31] Limerick Shannon Metropolitan Area Transport Strategy, NTA, 2023
[32] Limerick Development Plan 2022-2028, Limerick City and County Council, 2022
[33] Draft Limerick Climate Action Plan 2024-2029
[34] Limerick City and Environs Green and Blue Infrastructure Strategy, Limerick City and County Council, 2023
[35] https://mypoint.limerick.ie/en/consultation/limerick-public-realm-strategy [Accessed March 2024]

large residential developments beside major transportation routes has the potential to allow a large number of residents to be exposed to the potential harmful effects of noise.

Technical Guidance Document Part E (2014) of the Building Regulations[36] does not provide any requirements for the type and location of new buildings besides existing major noise sources i.e. bringing people to noise. The guidance only relates to the mitigation of sound transfer between dwellings and rooms within a building. Additionally, while the Building Regulations (Part F Amendment, 2019[37]) provide details on the ventilation requirements for new residential developments their implementation will not necessarily ensure thermal comfort for occupants and prevent overheating, particularly where closed windows are proposed for new developments in order to achieve target internal noise levels.

Relevant standards and guidance for the consideration of noise where there is proposed new residential development near major transportation sources (roads and railways) include the Professional Planning Guidance on Planning & Noise: New Residential Development[38] (ProPG, 2017), Acoustic Ventilation and Overheating, Residential Design Guide[39] (AVO, 2021), BS 8233:2014 Guidance on sound Insulation and Noise Reduction for Buildings[40] and ISO 19488:2021 Acoustics: Acoustic classification of dwellings[41]. ProPG (2017) was published by the Acoustics and Noise Consultants (ANC), Chartered Institute of Environmental Health (CIEH) and UK Institute of Acoustics (IOA). Its primary goal is to aid in planning to deliver sustainable development by promoting good health and well-being in relation to noise. It encourages the use of good acoustic design process in and around proposed new residential development and provides opportunities to incorporate effective design interventions that will enable residential development to proceed in areas that might otherwise have been considered unsuitable. The AVO guidelines provide an approach as to how the competing aspects of thermal and acoustic comfort can be managed, which is particularly important in situations where acoustic requirement may call for closed windows. BS 8233:2014 provides recommendations for the control of noise in and around buildings. The standard provides suitable internal noise levels within different types of buildings including residential dwellings for steady external noise sources. BS 8233:2014 recommends maximum ambient noise levels, as summarised in **Table 2.2**.

Table 2.2. BS 8233:2014 recommended internal L_{Aeq} target levels for overall noise in the design of a residential building. **See BS 8233:2014 for caveats and notes.*

Location	$L_{Aeq, 16hr}$ (0700-2300 hrs)*	$L_{Aeq, 8hr}$ (2300-0700 hrs)*
Living Rooms	35 dB	-
Dining Rooms	40 dB	-
Bedrooms	35 dB	30 dB

[36] https://www.gov.ie/en/publication/1d2af-building-regulations/ [Accessed March 2024]
[37] https://www.irishstatutebook.ie/eli/2019/si/263/made/en/print [Accessed March 2024]
[38] Professional Planning Guidance on Planning & Noise: New Residential Development, IOA, ANC, CIEH, 2017
[39] Acoustic Ventilation and Overheating, Residential Design Guide, IOA, ANC, 2020
[40] BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings, British Standards Institution, 2014
[41] ISO 19488:2021 Acoustics: Acoustic Classification of Dwellings, Organization for International Standardization, 2021

In the absence of Irish planning guidance local authorities in 2021 prepared Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development[42] under a subgroup of the NIECE National Local Authority Noise Working Group. This draft guidance includes an overarching aspiration that good acoustic design should be implemented from the outset of the design of new residential developments and recommends the use of the ProPG approach to bringing people to noise and cognisance of BS 8233:2014 and the AVO guidelines.

The aim of NPO 65 feeds into regional and local strategies and plans to support the development of strategic noise mapping and pro-active management of noise through noise action planning, including highlighting the importance of quiet areas for communities[43,44,45,46].

The LDP identifies that the dominant source of noise in the Limerick as being road traffic-related and consideration is given in Chapter 7: Sustainable Mobility and Transport and Chapter 11: Development Management Standards with respect to bringing noise to people and bringing people to noise.

Traffic related noise objectives, TR O53 (Noise and Transportation) and TR O54 (Noise Sensitive Development) include consideration of the requirement to identify appropriate mitigation measures to reduce traffic noise where levels are potentially harmful to human health and that proposed noise sensitive developments near major roads should be designed and constructed to minimise noise disturbance following good acoustic design process in accordance with ProPG and based on recommendations of the WHO.

Requirements are presented in the Development Management Standards that outline that developments along different categories of roads shall have a minimum set-back distance in order to curtail noise disturbance (**Table 2.3**). A shorter distance may be acceptable if measures are taken to limit noise to acceptable levels and good acoustic design is taken into account.

Table 2.3. Building lines on public roads (LDP 2022-2028).

Road Category	Minimum Building Line from the Near Road Edge
County Roads and Regional Roads	20 Metres
National Primary and Secondary Roads	30 Metres
New National Primary Roads	90 Metres

[42] Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development, NIECE Local Authority Noise Subgroup, 2021
[43] Regional Spatial and Economic Strategy for the Southern Region, 2020
[44] Mid-West Area Strategic Plan: Planning, Land Use and Transportation, Mid-West Regional Authority, 2012-2030
[45] Limerick Corporate Plan 2019-2024, Limerick City and County Council
[46] Limerick Development Plan 2023-2028, Limerick City and County Council

These points highlight some of the main steps which Limerick City and County Council has taken to provide a framework for taking consideration of noise pollution during the planning process in order to protect the general population from the effects of noise exposure.

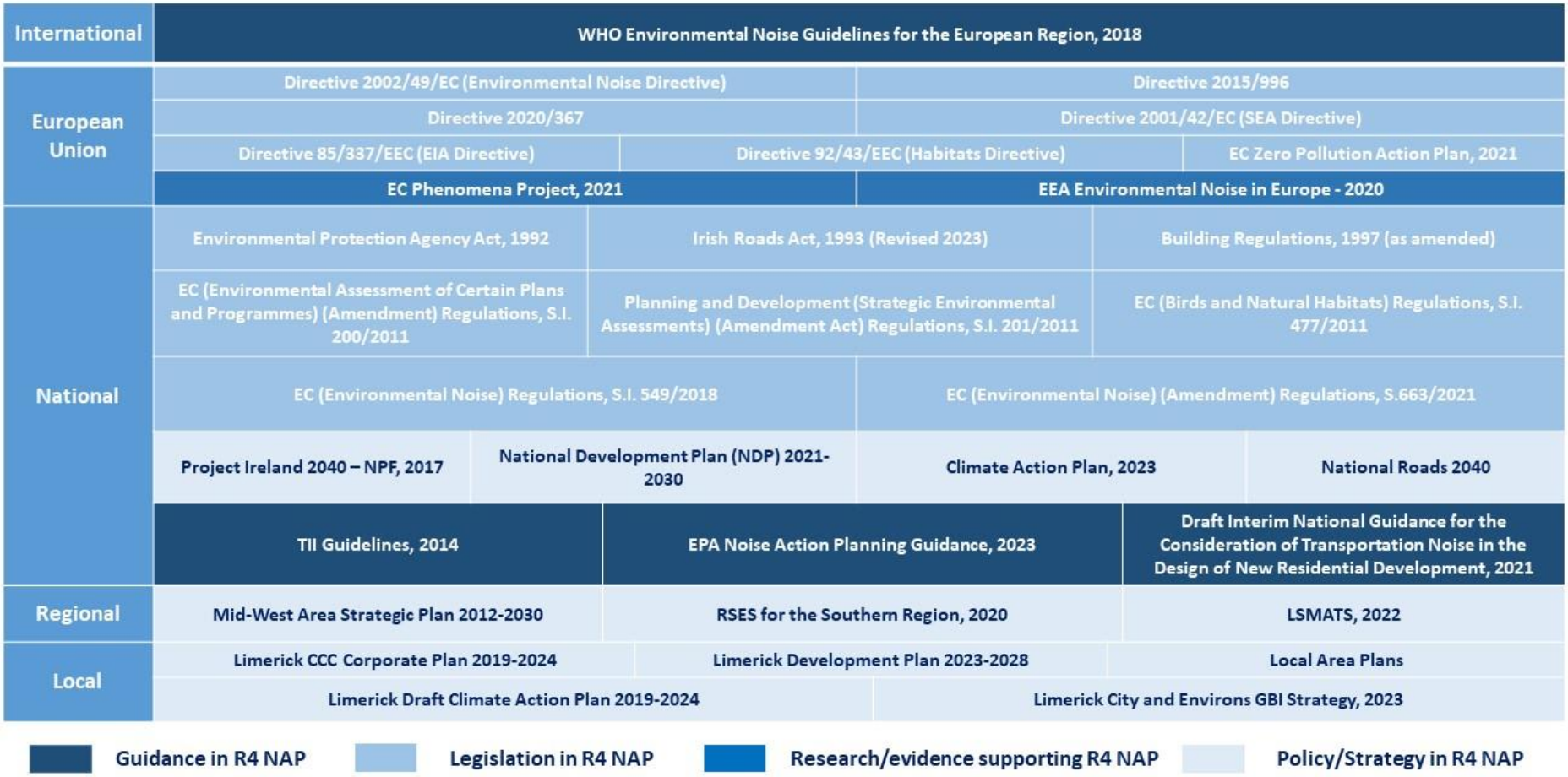


Figure 2.1. Existing international, European, national, regional and local noise management legislation, guidance and evidence base.

3. Review of Noise Action Plan 2018-2023

3.1 Introduction

The Limerick Noise Action Plan 2018-2023 was concerned with noise from major roads alone because the Limerick Agglomeration had not been defined in the Environmental Noise Regulations, at the time the plan was prepared.

The work undertaken during the implementation of the NAP focussed on a range of measures related primarily to:

- Developing the Council's noise modelling capability for the investigation of hotspots (now termed in this NAP as Priority Important Areas);
- Developing and implementing a national method to assess the cost benefit of noise mitigation works where it is necessary to reduce the potential harmful effects of traffic-related noise for three hotspots along major national roads in Limerick (Monaleen, Glencairin and Patrickswell);
- Preventing additional members of the community being exposed to undesirable road noise levels at new residential developments by developing a policy in the Limerick Development Plan (LDP) 2022-2028 and assessing planning applications where appropriate to identify where it may be necessary to reduce noise exposure to prevent the potential harmful effects of noise;
- Aiding in the preparation of national planning guidance for the consideration of proposed new residential developments near major roads;
- Sound pressure level monitoring to confirm road noise levels in the City and the investigation of sound pressure levels at Lough Gur, an area for potential designation as a Quiet Area;
- Public engagement through a number of webinars and moderated-led soundwalks (listening walks), to raise the awareness of the benefit to health of quiet areas and using a soundscape approach to investigate them[47].

The following is further consideration of the work described above that is relevant to County Limerick.

3.2 Mitigation Measures

The towns of Patrickswell and Oola in County Limerick were identified as hotspots in the NAP 2018-2023 related to transportation noise from the N24 and M20 roads respectively.

The focus of the Council's effort on noise mitigation during the period of the NAP was the assessment of road noise where it is an issue from major national roads. Patrickswell is the first of these towns that the harmful effects of road noise and potential mitigation measures have been reviewed for County Limerick, outside the Limerick Agglomeration (**Figure 3.1**).

[47] The a sound or combination of sounds that forms or arises from an immersive environment as perceived or experienced and/or understood by a person or people, in context.

Figure 3.1. Section of M20 motorway south of Junction 4 adjacent to Patrickswell.

In December 2019 the Council purchased proprietary noise modelling software for the calculation of noise levels from environmental noise. Following a period of training the Council undertook a review of different cost benefit assessment techniques that could be used to investigate a variety of noise mitigation measures where road noise levels are undesirable and potentially harmful to the health of the population. After discussions with TII it was agreed that the Council would implement a UK method called WebTAG, modified in an Irish context. The first two cost benefit assessments the Council undertook as pilot studies were in the Limerick Agglomeration, in collaboration with TII for the Castletroy/Monaleen and Ballycummin areas, adjacent to the M7 and M20 respectively. The cost benefit assessments considered the estimated monetised benefit to health by implementing noise mitigating measures along the M7 and M20 versus the cost to implement them. The measures reviewed were reflective and absorptive acoustic barriers, a change of road pavement to a low noise road surface - from Hot Rolled Asphalt (HRA) to Stone Mastic Asphalt (SMA) and a combination of changing the pavement and barriers.

WebTAG is a tool that can be used to assess the expected environmental impacts of transport policy proposals and projects. For each change in noise level, a monetary value is assigned for the change in the following health impacts: amenity (annoyance), acute myocardial infarction, dementia, stroke, and sleep disturbance. These values are based on the latest evidence from the WHO on the link between noise exposure and health impacts and provide a net value to health for a 60 years appraisal period.

The assessments involved noise monitoring integrated with an assessment of traffic flows, used to calibrate noise calculations. Noise modelling was then undertaken for current and future years (fifteen years on) '*do something*' and '*do nothing*' scenarios. The exercise to estimate the costs to implement the potential measures was undertaken by TII. TII informed the Council in September 2021 that they had no further comments on the Council's reports. In acknowledgement of the Council's efforts TII committed to implementing a measure along the M7, to resurface the pavement with SMA between Junctions 28 and 30, because it was the most cost-effective measure. Those works were undertaken between July and October 2022. Limerick City and County Council is the first local authority in Ireland to have undertaken these type of cost benefit assessments to review noise mitigation measures.

Following the completion of the pilot studies the Council undertook a further WebTAG noise assessment for the Patricskwell area, besides the M20 motorway, located south of Junction 4. The potential mitigation measures that have been investigated along a section of the M20 were an absorptive acoustic barrier along the road, a change of road pavement from HRA to SMA, and a combination of a barrier and a change of road surface (e.g. **Figures 3.2** and **3.3**).

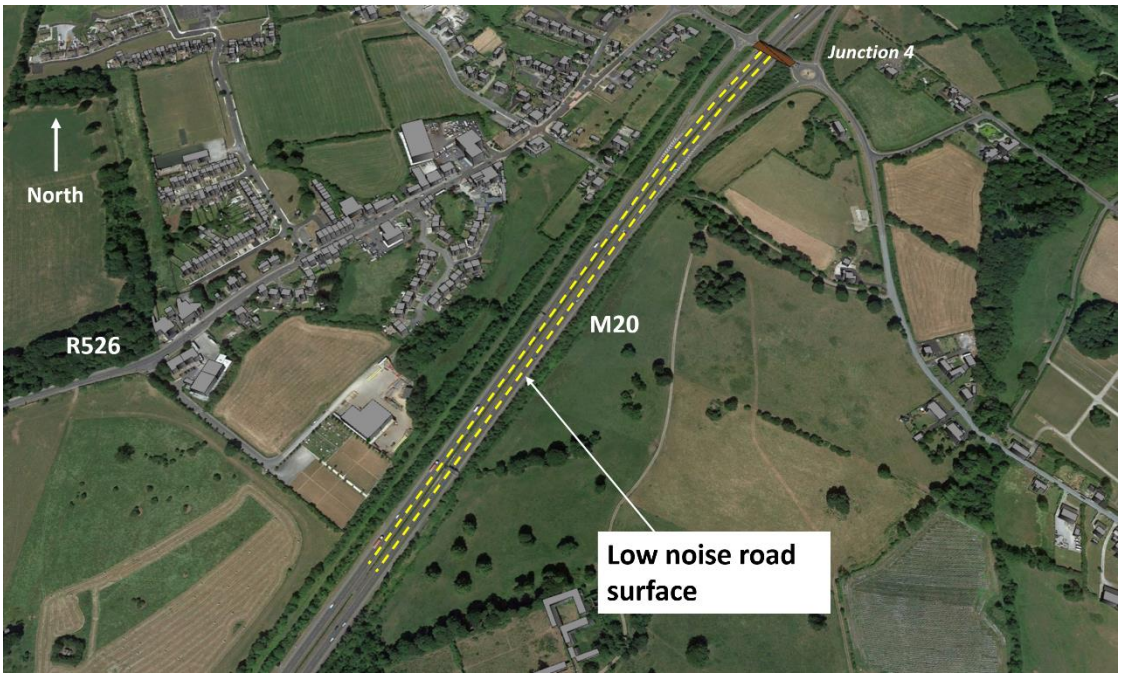


Figure 3.2. Mitigation option: a low noise road surface (yellow dashed lines) from the bridge at Junction 4 of the M20 extending southwestwards along the M20 adjacent to Patrickswell. (Source: Google Earth).

Figure 3.3. Mitigation option (A): a proposed 4 metres high absorptive acoustic barrier along the M20 adjacent to Patrickswell. (Source: Google Earth).

The cost benefit assessment for the Patrickswell hotspot has been shared with TII.

A noise assessment was not undertaken for the Oola hotspot during the period of the NAP 2018-2023. Tipperary County Council, in partnership with Limerick City and County Council, TII and the Department of Transport are preparing the N24 Cahir to Limerick Junction Project which is proposed to by-pass Oola which will review the impact of noise on the population and if constructed will significantly reduce traffic passing through the town and potentially reduce road noise.

3.3 Planning Applications

Prior to the adoption of the Limerick Development Plan (LDP) 2022-2028 the Council did not have a specific noise policy in relation to proposed new residential developments planned near major roads. The consideration of planning files was carried out on a case-by-case basis taking account of international and national guidance, standards and best practise. An objective has been adopted in the LDP under TR O54 Noise Sensitive Development:

"It is an objective of the Council to require noise sensitive developments in close proximity to heavily trafficked roads to be designed and constructed to minimise noise disturbance, follow a good acoustic design process and clearly demonstrate that significant adverse noise impacts will be avoided in accordance with Professional Practice Guidance on Planning and Noise (2017) and based on the guidance and recommendations of the World Health Organisation."

The objective is in accordance with Objective 65 of the NDP 2040. It supports the flexibility to reduce the building lines along public roads (Development Management

Standards) in areas that might be considered unsuitable for housing where good acoustic design is demonstrated to reduce the potential harmful effects of noise for residents.

The Council was also a lead local authority, along with Kildare County Council, in a subgroup of the Local Authority NIECE Local Authority Noise Working Group for the development of planning guidance - the Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development (2021).

During the life of the NAP 2018-2023 the Council has reviewed plans for approximately sixty residential units adjacent to major roads in County Limerick, outside the Limerick Agglomeration, requiring Acoustic Design Statements to be submitted.

In making recommendations to the planning authority the Council has reviewed the strategic noise mapping for 2017 to establish the expected noise levels (L_{den} and L_{night}) without mitigation, taking cognisance of the ProPG, BS 8233:2014, as well as recommendations by the WHO for internal and external sound pressure levels to protect residents amenity, health and well-being.

3.4 Quiet Areas

European legislation highlights the need to preserve areas that are currently unaffected by environmental noise. These so called quiet areas are an important component in County Limerick and offer tranquillity away from noise pollution.

3.4.1 Lough Gur

As a pilot exercise in County Limerick the Council has undertaken sound pressure level monitoring besides Lough Gur near the visitors centre (**Figure 3.4**) to determine whether the site meets traditional criteria used in previous rounds of noise action planning to designate Quiet Areas (< 55 L_{den}).

Figure 3.4. Sound level monitor located besides the visitors centre at Lough Gur.

The results of the monitoring are presented in **Table 3.2**.

Table 3.2. Results of sound pressure level monitoring at Lough Gur.

Year	LAeq,16hr (dB)	Lden (dB)	Lday (dB)	Levening (dB)	Lnight (dB)
2021	51.6	54.0	52.5	46.5	46.1
2022	50.0	54.4	50.5	47.9	47.5
2023	50.0	51.8	50.9	45.0	43.5

The Council will consider an application to designate Lough Gur as a Quiet Area during the period of the NAP 2024-2028. The discussion of proposed actions for Candidate Quiet Areas for designation is presented in **Section 7.6.1**.

3.4.2 Hush City

The EEA recommends that instead of identifying areas with low environmental noise we should be searching for calm[48]. Many studies have reported the positive effects of natural sounds on the health and well-being of humans[49] and so a healthy acoustic environment is more than simply the absence of unwanted noise. A method which collects the perceived experiences and understanding of the combined sounds in the environment where people live and work, a soundscape approach[50], complements environmental noise management and has multiple benefits by offering the potential to involve citizens in the identification, assessment and planning of urban environments.

As part of Limerick being awarded European Green Leaf City for 2020 by the European Commission the Council hosted a webinar[51] for Limerick citizens in collaboration with Dr. Antonella Radicchi, creator of the Hush City participatory framework and Hush City web application[52,53,54]. The framework uses a soundscape approach to encourage citizens to investigate tranquil and calm areas that are accessible to the public. The Hush City app is a tool to collect their perceived responses to the acoustic environment which can be used by regulatory authorities to inform policy decisions. This data can be collected by means of soundwalks (or listening walks) for citizens led by a moderator.

Over the period of the NAP (2018-2023) the Council has hosted a number of soundwalks (listening walks) in Limerick City for the public, along the Three Bridges Walk and at The People's Park for the investigation of quiet areas in Limerick (e.g. **Figure 3.5**).

[48]European Environment Agency: *Good practice guide on quiet areas*. EEA Tech. Report, No. 4, 2014.
[49]E. Ratcliffe, "Sound and soundscape in restorative natural environments: A narrative literature review", *Frontiers in Psychology*, Vol. 12, pp. 1-7, 2021.
[50]International Organization for Standardization*, Technical Specification ISO/TS 12913-1: Acoustics – Soundscape – Part 1: Definition and conceptual framework*, 2014.
[51] https://www.youtube.com/watch?v=syah7YnusPE&t=1404s [Accessed March 2024]
[52] A. Radicchi, D. Henckel, M. Memmel, "Citizens as smart, active sensors for a quiet and just city. The case of the "open source soundscapes" approach to identify, assess and plan "everyday quiet areas" in cities", *Noise Mapping*, Vol. 5, pp. 1-20, 2018.
[53]P. Dunbavin, A. Radicchi, "The Hush City project and its relevance to planning policy", *Acoustics Bulletin (Institute of Acoustics, UK)*, Vol. 43, No. 5, pp. 34-40, 2018.
[54] A. Radicchi, ""Everyday quiet areas": What they are and how they can be integrated in noise action plans", in *47th International Congress and Exposition on Noise Control Engineering (INTERNOISE 2018)*, (Chicago, USA), 2018.

Figure 3.5. Example of participants assessing the soundscape during a soundwalk in Limerick City along the Three Bridges Walk.

The results of soundwalks undertaken along the Three Bridges Walk were presented to an acoustic conference in 2023[55]. It is proposed to expand this work outside the Limerick Agglomeration, into County Limerick for areas such as Lough Gur and other potential quiet areas, during the period of the NAP 2024-2028 to collect evidence for the designation of Quiet Areas (see **Section 7.6.3**).

3.5 Other Mitigation Measures

A number of infrastructural changes have occurred that have had an impact on the noise environment during the life of the NAP 2018-2023. These are summarised below.

3.2.1 Green Routes

The Council has four greenway projects in County Limerick that are at various stages of design, prior to planning, to create walking and cycling trails:

- University of Limerick to Montpelier;
- the extension of the Limerick Greenway from Rathkeale to Limerick;
- Limerick to Oola; and,
- Patrickswell to Charleville.

[55] Jennings et al., A Citizen Science and Soundscape Approach to the Investigation of Quiet Areas for Limerick City, Forum Acusticum 2023

These projects will integrate and enhance the existing natural and built features, help support the economic development of local communities and promote the health and well-being of citizens in Limerick.

The Council also has greenway connectivity projects at various stages of design at Newcastle West, Rathkeale and Abbeyfeale. The Active Travel Section continue to fund installation of new footpaths across County Limerick to encourage people to walk to school, shops and other local amenities. In rural towns, schemes to promote cycling are also being progressed including a shared route in Adare.

The Limerick Greenway runs for 40 km from Rathkeale to the Kerry border near Abbeyfeale (e.g. **Figure 3.6**).

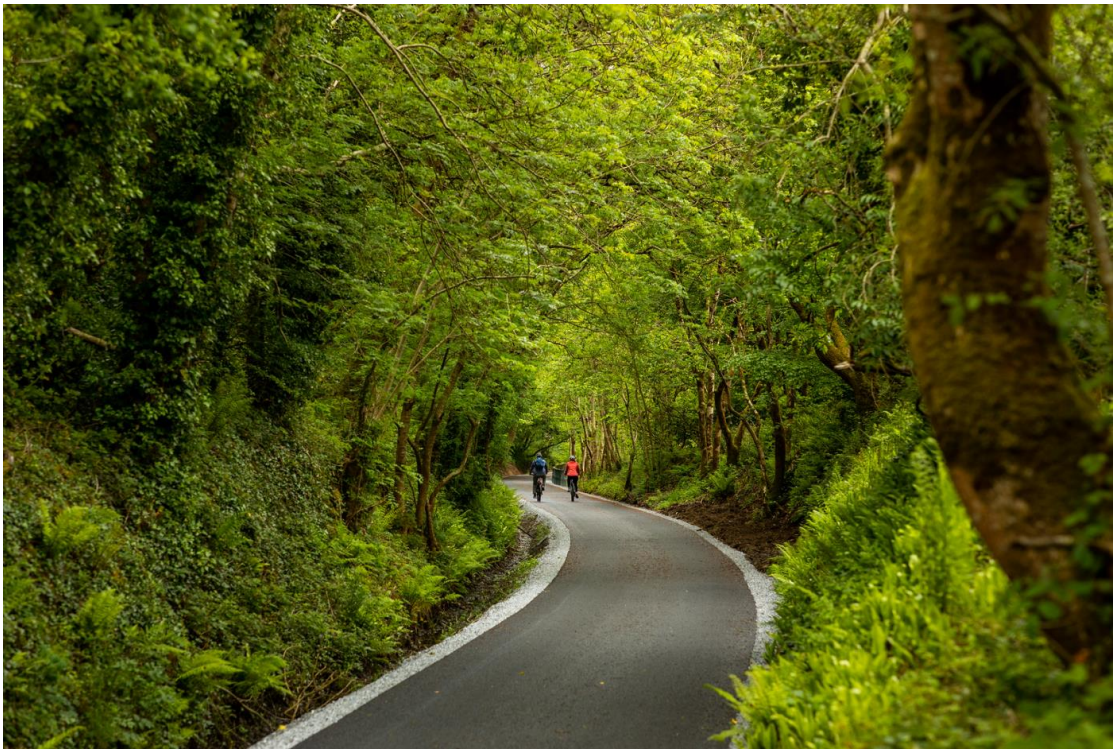


Figure 3.6. Section of Limerick Greenway in County Limerick.

It was originally developed by the Great Southern Trail Company who held the licence from Iarnrod Éireann. The Council took over the licence and responsibility for the Greenway in December 2015. Infrastructural enhancement works have been completed where necessary including resurfacing, fencing and signage to improve the Greenway. A 16 km extension to the Greenway from the Kerry border to Listowel has been completed by Kerry County Council and the proposed extension from Rathkeale to Limerick is being progressed.

3.2.2 Traffic Calming

The Council each year invests in significant traffic calming measures such as speed cushions, speed ramps, table top junctions, segregated pedestrian and cyclist facilities, driver feed-back signage, general signage and pedestrian crossings that aim to reduce

traffic speeds in residential neighborhoods thus making them safer for pedestrians and cyclists. Reduced speeds also potentially reduce road noise.

3.2.3 Road Resurfacing

Each year the Council carries out a significant amount of road resurfacing primarily on the roads in the City and County. The Council uses SMA surfacing materials in speed restricted areas as the preferred wearing course. These surfaces produce less road noise (specifically tyre/rolling noise) at low traffic speeds than the traditional ones thus leading to less local noise pollution. However, HRA is still used at locations where there are significant heavy goods vehicles turning movements.

3.2.4 Electric Vehicle Charging Points

The Council in association with ESB ecars has made electric vehicle charging points available on the public roads in Limerick City and County. This will encourage the use of electric cars which emit less road noise at low speeds though urban areas. The current locations of the electric car charge points in County Limerick are at: Woodlands House, Adare; Heritage Centre, Adare; Reidy's Topaz, Foynes; Off Grove Crescent, Abbeyfeale; Garvey's Centra Service Station, Newcastle West; and Church Street, Newcastle West.

4. Description of the Planning Area for Action Planning

4.1 Area of Coverage

In County Limerick, outside the Limerick Agglomeration, the Council is responsible for noise action planning relating to sections of major roads[56] passing through its administrative area (**Figure 1.1**).

The sections of relevant roads which qualified for strategic noise mapping and, as such, are subject to consideration for noise action planning are given in **Table 4.1**.

Table 4.1. Sections of Major Roads for Noise Mapping in administrative area of Limerick City and County Council outside of the Limerick Agglomeration.

Road	Approximate Length (km)	Location
M7	6.8	M7 Junction 28 northwards
M8	3.0	Near Kilbeheny
M20/N20	23.5	Agglomeration boundary near Junction 3 of M20 to Charleville
N21	56.7	Junction with M20/N20 to Abbeyfeale
N24	27.8	Agglomeration boundary near Killonan to Dromkeen
N69	21.7	Agglomeration boundary near Clarina to Kilcornan
Total	**139.5**	

4.2 General Population Exposed to Traffic Noise

The population of County Limerick, outside the Limerick Agglomeration, is approximately 115,100 based on the 2022 census. The main population centres exposed to transportation noise from major sections of roads for this NAP lie within Limerick towns and villages outside of the Limerick Agglomeration and are also associated with ribbon developments.

4.3 Location of Noise Sensitive Buildings

Certain locations and non-residential building types are considered to be more sensitive to noise pollution than others. The main priority of the END is to reduce environmental noise exposure in residential areas. It is also recommended that competent authorities designate buildings such as educational and health care facilities as being noise sensitive.

Non-residential buildings and locations which are viewed as being noise sensitive near the major roads within the administrative area of the Council have been identified based on a review of the strategic noise maps. Buildings including hospitals, residential care facilities and schools have been considered and are presented in **Table 4.2**.

[56]As defined above in section 1.4.1

Table 4.2. Noise Sensitive Buildings in the mapped area.

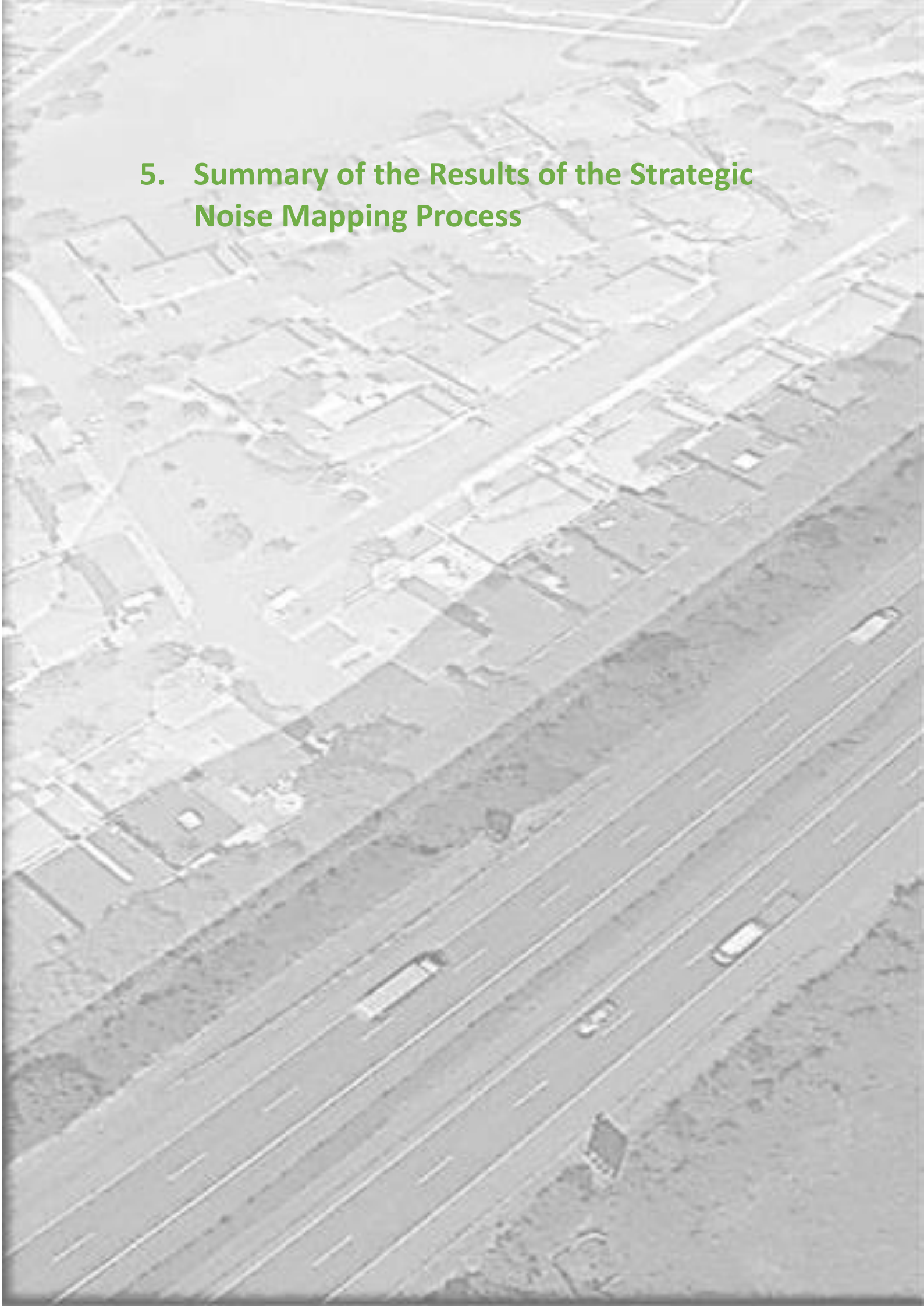
Noise Sensitive Location	Address	Facility
Adare and District Nursing Home	Croagh	Residential Home
College of Further Education and Training - Abbeyfeale	Abbeyfeale	Education
Scoil Naomh Iósaf	Adare	Education
Coláiste Íde agus Iosef	Abbeyfeale	Education

4.4 Role and Responsibilities

The roles and responsibilities of the TII and the Council in County Limerick, outside the Limerick Agglomeration, are summarised in **Table 4.3**.

Table 4.3. Roles and Responsibilities for the relevant authorities in County Limerick, outside the Limerick Agglomeration.

Organisation	Strategic Noise Mapping Body (NMB) Responsibility	Noise Action Plan Preparation - Responsibility	Noise Action Plan Implementation - Responsibility
Limerick City and County Council	Noise Mapping Body responsible for making and approving strategic noise maps for non-national major roads in County Limerick (no non-national major roads were identified under Round 4 mapping).	Action Planning Authority responsible for making and approving action plans, in consultation with NMBs.	Detailed evaluation of Priority Important Areas, in consultation with Noise Mapping Bodies, including identification of noise mitigation measures and implementation of those measures within their areas of competence and responsibility, subject to resources and budget.
Transport Infrastructure Ireland	Noise Mapping Body responsible for making and approving strategic noise maps for major roads designated as national roads.	Consultee during action planning, with consideration of issues resulting from the strategic noise maps within their area of responsibility including identification of priority important areas to be included within the Noise Action Plan.	Consult and engage with the Council to identify and agree noise mitigation measures for locations within their areas of competence and responsibility and implementation of same subject to resources and budget.



5. Summary of the Results of the Strategic Noise Mapping Process

5.1 CNOSSOS-EU:2020

The European Commission (EC) Directive 2015/996[57] established common noise assessment methods meeting the requirements of the END. It replaced Annex II of the END now requires that Member States apply the Common Noise Assessment Methods for Europe (CNOSSOS-EU) for the noise modelling of road, rail, aircraft and industrial sources. The use of the CNOSSOS-EU method has been transposed into Irish Law via the European Communities (Environmental Noise) (Amendment) Regulations 2021 (S.I. 663/2021) and has been used to produce the Strategic Noise Maps and to calculate the noise exposure statistics and harmful effects **(Sections 5.5 and 5.6)** for sections of major roads in the NAP.

5.2 Model Calculation Scenarios

Two result formats have been prepared for the noise indicators specified in the Regulations, L_{den} and L_{night}:

- A 10 metres grid format where the model outputs a result every 10 metres in a uniform grid. These results are used to produce the Strategic Noise Maps; and
- Façade receiver format - where the model outputs a result at receiver points digitised at the façades of residential, school and hospital buildings. These results are used to calculate the exposure statistics and harmful effects.

5.3 Regulatory Background to Noise Exposure and Harmful Effects

The Fifth Schedule of the Environmental Noise Regulations 2018 sets out the data which is to be sent to the European Commission. With respect to exposure statistics, it is required that the number of people are estimated within 5 dB bands between 55 dB to 75 dB L_{den}, 50 dB and 70 dB L_{night} and above 75 dB L_{den} and 70 dB L_{night}, rounded to the nearest one hundred persons, based on the strategic noise maps[58].

The EC Environmental Noise (Amendment) Regulations, 2021, transposes the EC Delegated Directive (EU) 2021/1226[59] into Irish Law. It sets out the assessment methods for harmful effects, which considers ischaemic heart disease (IHD), high annoyance (HA) and high sleep disturbance (HSD).

The exposure and harmful effects statistics are summarised in **Sections 5.5** and **5.6**, respectively.

[57] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0996&from=PT [accessed 9th March 2024]
[58] Where the noise level is calculated at a 4 metres height above ground level.
[59] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021L1226 [accessed March 2024]

5.4 Strategic Noise Mapping Figures

The strategic noise maps are consistent with the requirements of the Environmental Noise Regulations, 2018.

The maps are noise contour maps and a graphical representation illustrating the distribution of noise levels over a geographical area. The colours of the noise exposure bands are indicated in the legend, with darker colours representative of higher noise levels.

The Regulations do not set out noise limits which are permissible or not permissible in relation to environmental noise, however, do set the noise exposure bands to be reported, which are reflected in the strategic noise maps. In the absence of noise limits, it could be assumed that the closer the calculated noise level is to the highest noise exposure band set out in the Regulations the more undesirable it may be. Conversely, the closer the calculated noise is to the lowest noise exposure band the more desirable it may be.

The Round 4 strategic noise maps for County Limerick, outside the Limerick Agglomeration, are shown for the County in **Figures 5.1** and **5.2** for the two noise indicators specified in the Regulations, L_{den} and L_{night}, respectively. The strategic noise maps are presented at a more detailed local scale in Appendix C. The Round 4 strategic noise mapping is also available online, on a national basis, at the following website:

https://gis.epa.ie/EPAMaps/.

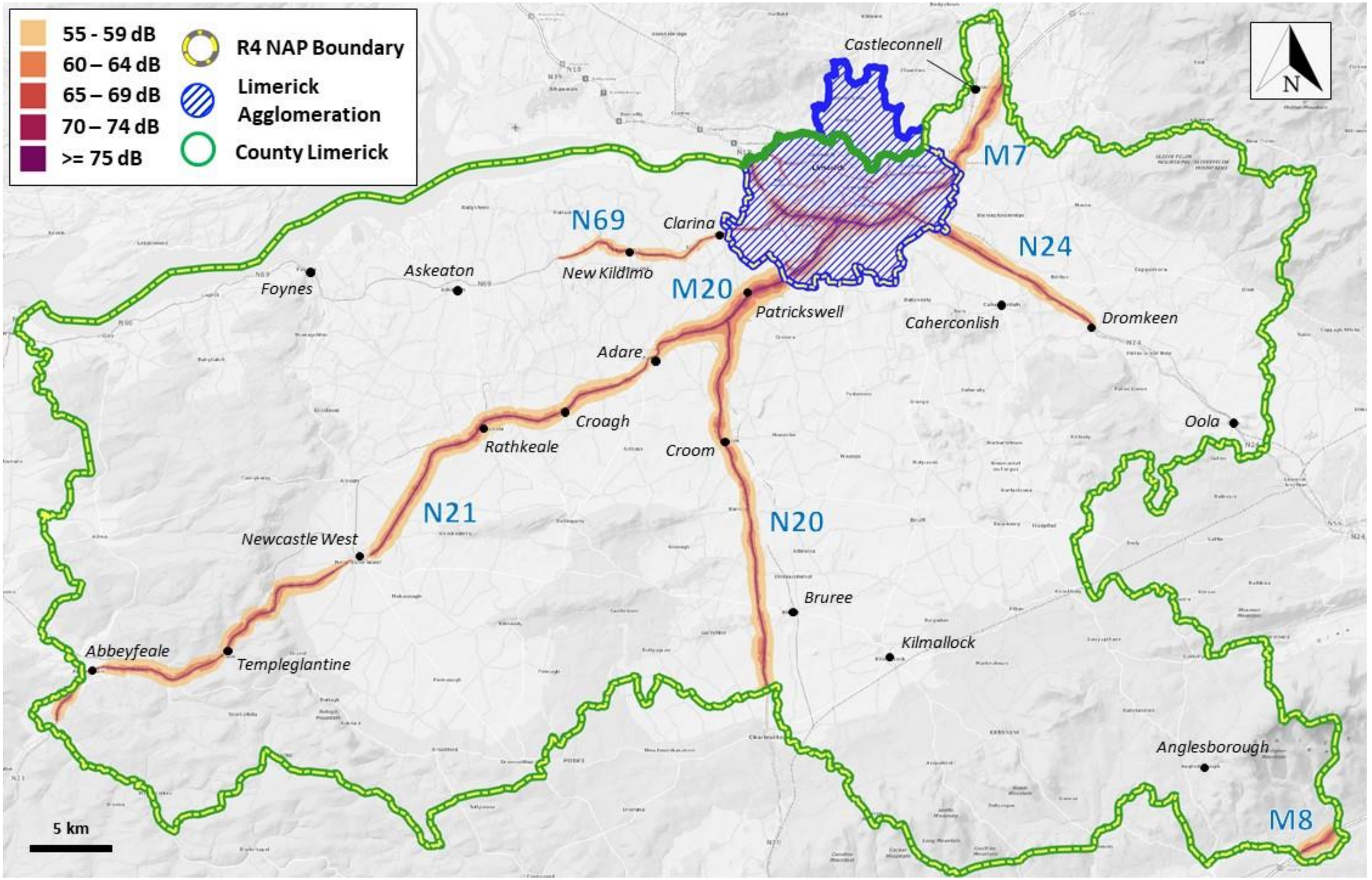


Figure 5.1. The Round 4 (R4) L_{den} strategic noise map for County Limerick (outside the Limerick Agglomeration).

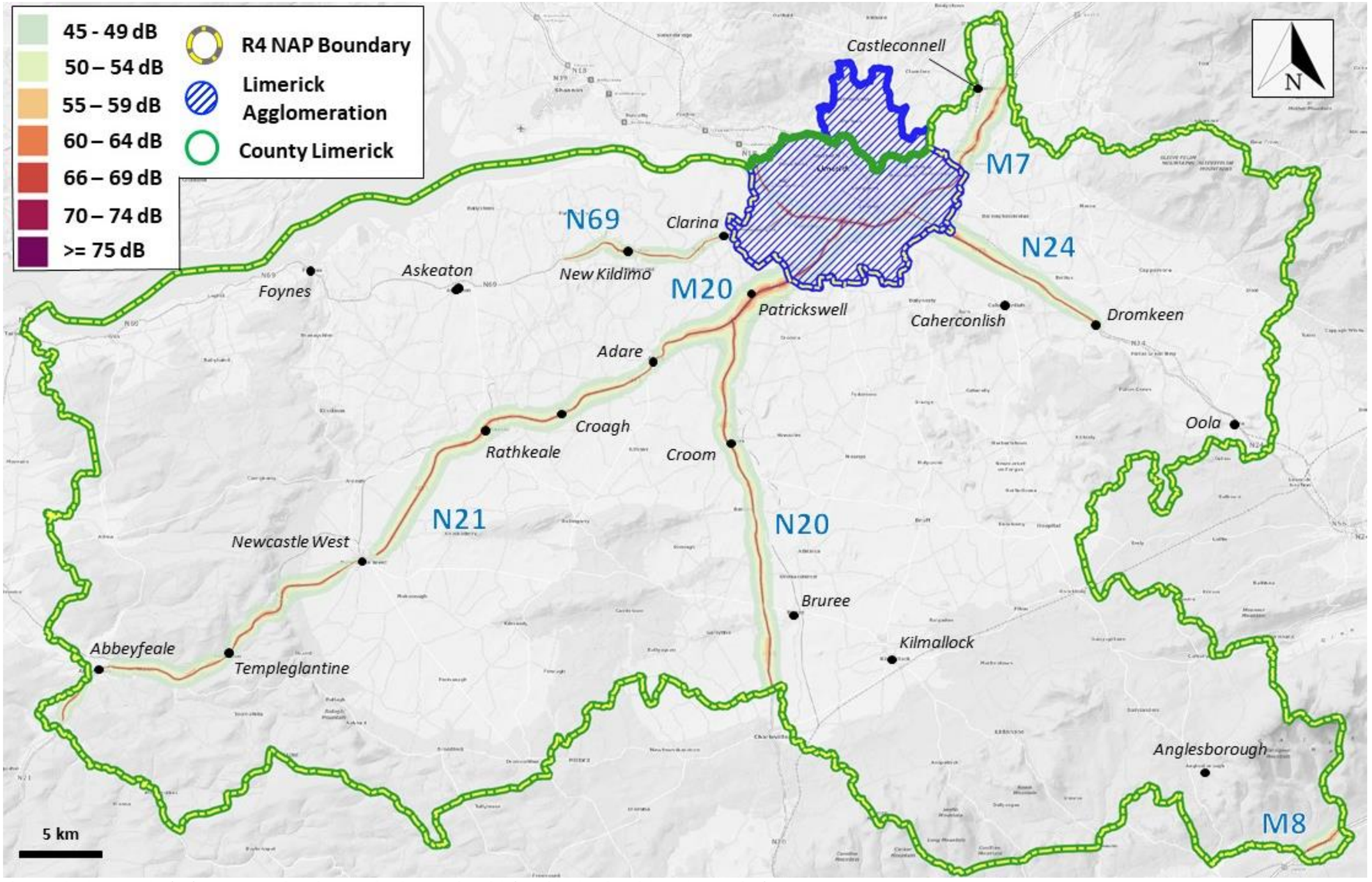


Figure 5.2. The Round 4 (R4) L_{night} strategic noise map for County Limerick (outside the Limerick Agglomeration).

5.5 Noise Exposure Assessment for County Limerick

A direct comparison of the Round 4 noise exposure statistics with the previous three rounds has not been undertaken because it is methodologically complex and will be inaccurate. This is because the computational methodology between the first three rounds of strategic noise mapping (CRTN 1988) and Round 4 (CNOSSOS-EU:2020) has changed, the geographical area of Limerick has been separated under the Environmental Noise Regulations, 2018, between the Limerick Agglomeration and County Limerick (outside the Agglomeration) and the lengths of roads qualifying for strategic noise mapping between the first three NAPs and the Round 4 NAP are not the same.

The Round 4 noise exposure statistics for the Agglomeration are presented in **Tables 5.1** to **5.6** and rounded to the nearest 100 as required under the regulations.

Table 5.1 Number of people in dwellings exposed to L_{den} from major roads.

Noise Exposure (dB)	Major Roads
55-59	4,900
60-64	2,300
65-69	1,100
70-74	1,100
>= 75	900

Table 5.2 Number of people in dwellings exposed to L_{night} from major roads.

Noise Exposure (dB)	Major Roads
45-49	6,600
50-54	3,100
55-59	1,300
60-64	1,100

Table 5.3 Percententage of population exposed to L_{den} from major roads.

Noise Exposure (dB)	Major Roads
55-59	4 %
60-64	2 %
65-69	1 %
70-74	1 %
>= 75	1 %

Table 5.4 Percentage of people in dwellings exposed to L_{night} from major roads.

Noise Exposure (dB)	Major Roads
45-49	6 %
50-54	3 %
55-59	1 %
60-64	1 %

Table 5.5 Number of educational buildings and hospital buildings exposed to L_{den} from major roads (mapped in Appendix D).

Noise Exposure (dB)	Major Roads
55-59	1 Coláiste Íde agus Iosef, Abbeyfeale
60-64	1 Scoil Naomh Iosaf, Adare
65-69	2 Adare and District Nursing Home, Croagh; College of FET - Abbeyfeale
70-74	0
>75	0

Table 5.6 Number of educational buildings and hospital buildings exposed to L_{night} from major roads (mapped in Appendix D).

Noise Exposure (dB)	Major Roads
45-49	0
50-54	2 Coláiste Íde agus Iosef, Abbeyfeale; Scoil Naomh Iosaf, Adare
55-59	0
60-64	2 Adare and District Nursing Home, Croagh; College of FET - Abbeyfeale
65-69	0
70-74	0
>75	0

5.6 Harmful Effects Assessment for County Limerick

The Environmental Noise (Amendment) Regulations, 2021, set out the equations to be used for calculating harmful effects and noise thresholds above which health effects should be calculated and reported in noise action plans. For road traffic noise the calculations for harmful effects should be undertaken in 1 dB assessment bands and should be undertaken above the following thresholds:

- 53 dB L_{den};
- 45 dB L_{night}.

Table 5.7 presents the calculated harmful effects from high annoyance (HA), high sleep disturbance (HSD) and ischaemic heart disease (IHD) in the case of traffic-related noise in County Limerick from the major roads qualifying for strategic noise mapping outside of the Limerick Agglomeration.

Table 5.7 Number and percentage of the population in County Limerick exposed to harmful effects of noise from major roads.

Total number of cases of IHD	**2**
% of population with IHD	0.00%
Total number of people HA	**2,350**
% of population HA	2.04%
Total number of people HSD	**767**
% of population HSD	0.67%
*Total population for County Limerick, outside the Limerick Agglomeration = 115,100	

It is important to note that the numbers presented do not represent the actual number of people suffering from harmful effects but estimated numbers based on the equations set out in the Environmental Noise (Amendment) Regulations.

The results indicate that the greatest impact of traffic-related noise from major roads on the population in County Limerick is high annoyance, followed by high sleep disturbance. The impact of traffic-related noise from major roads on the population causing ischaemic heart disease is considered to be very low.

The implementation of measures to reduce the populations exposure to noise from major roads aims to reduce the associated health effects.

6. Approach to Areas to be Subject to Noise Mitigation Activities

6.1 Regulatory Background

The Environmental Noise Regulations require that the Action Planning Authorities address "priorities" and "the most important area or areas" with a view to identifying "measures" that will help "avoid, prevent or reduce" the "harmful effects, including annoyance, due to exposure to environmental noise". The EPA Guidance provides further guidance on these concepts, and sets out a recommended approach following a three-step approach to identifying priorities:

1. **Important Areas (IAs)** – these are locations exposed to environmental noise which may be harmful to human health, as indicated by international guidance;
2. **Most Important Areas (MIAs)** – these locations are a subset of the IAs where the health effects are highest, typically through a product of noise exposure levels and the number of people exposed to noise; and
3. **Priority Important Areas (PIAs)** – between 5 and 10 MIAs or group of similarly affected MIAs, identified as those which will be addressed during the implementation of the NAP.

6.2 Overview of Process

The process of identifying Important Areas (IAs), Most Important Areas (MIAs) and Priority Important Areas (PIAs) within the Limerick Agglomeration is Stage 1 of a two-stage process for the identification of areas to be subject to noise management activities.

The process of identifying IAs within the Agglomeration involves using the results of the strategic noise mapping to identify noise sensitive residential buildings[60] and the estimated number of people exposed to L_{den} levels above the guideline values set by the EPA Guidance which are in line with the 2018 WHO *Environmental Noise Guidelines for the European Region* (WHO ENG 2018)[61]. This is followed by an automated process within Geographic Information System (GIS) software to identify areas with the highest concentrations of people highly annoyed, referred to as the MIAs. The MIAs that are to be addressed during the implementation of the NAP 2024-2028 are referred to as PIAs.

It is important to emphasise that the approach to identifying MIAs is of a statistical nature and pertains to the entire population encompassed by the noise maps. It should not be construed as a precise assessment of harmful effects for specific buildings, nor are the extents of the MIAs definitive. Instead, they are indicative for the identification of areas with a relatively high number of people highly annoyed due to noise.

[60] The assignment of population to the calculated noise levels is set out within Annex II of the END (CNOSSOS-EU).
[61] Environmental noise guidelines for the European Region, WHO 2019. Available at: https://www.who.int/europe/publications/i/item/9789289053563 [Accessed March 2024]

Stage 2 of the process takes place during the implementation of the NAP, focussing on undertaking an assessment of noise mitigation measures for each of the identified Priority Important Areas.

6.3 Identified Most Important Areas (MIAs) and Selected Priority Important Areas (PIAs)

Five MIAs have been identified along major roads for the towns of Abbeyfeale, Adare, Croom, Newcastle West and Patrickswell based on a criterion of 10 or more people expected to be highly annoyed per 100 m^2 (**Figures 6.1** to **6.5**). These towns have been selected as PIAs for the NAP 2024-2028, with actions to be identified to reduce noise from the major roads that pass through or adjacent to them. The MIAs represent where the harmful effects on the population are likely to be most concentrated and not where there is likely to be the most harmful effects caused.

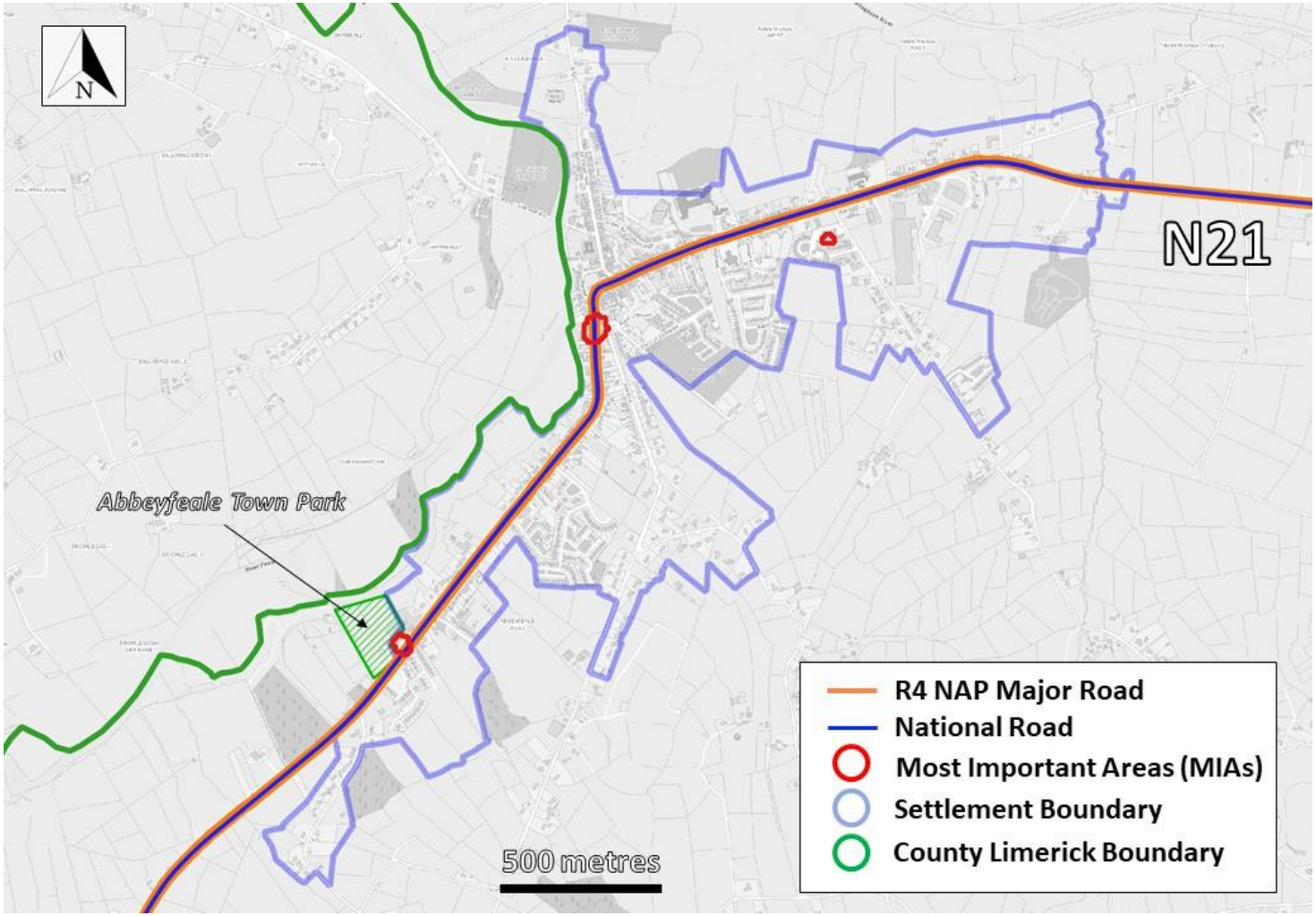


Figure 6.1. The Abbeyfeale PIA with MIAs identified along the major road qualifying for strategic noise mapping (N21). **The Abbeyfeale Town Park is identified in the context of Candidate Quiet Areas in Section 7.6.4.*

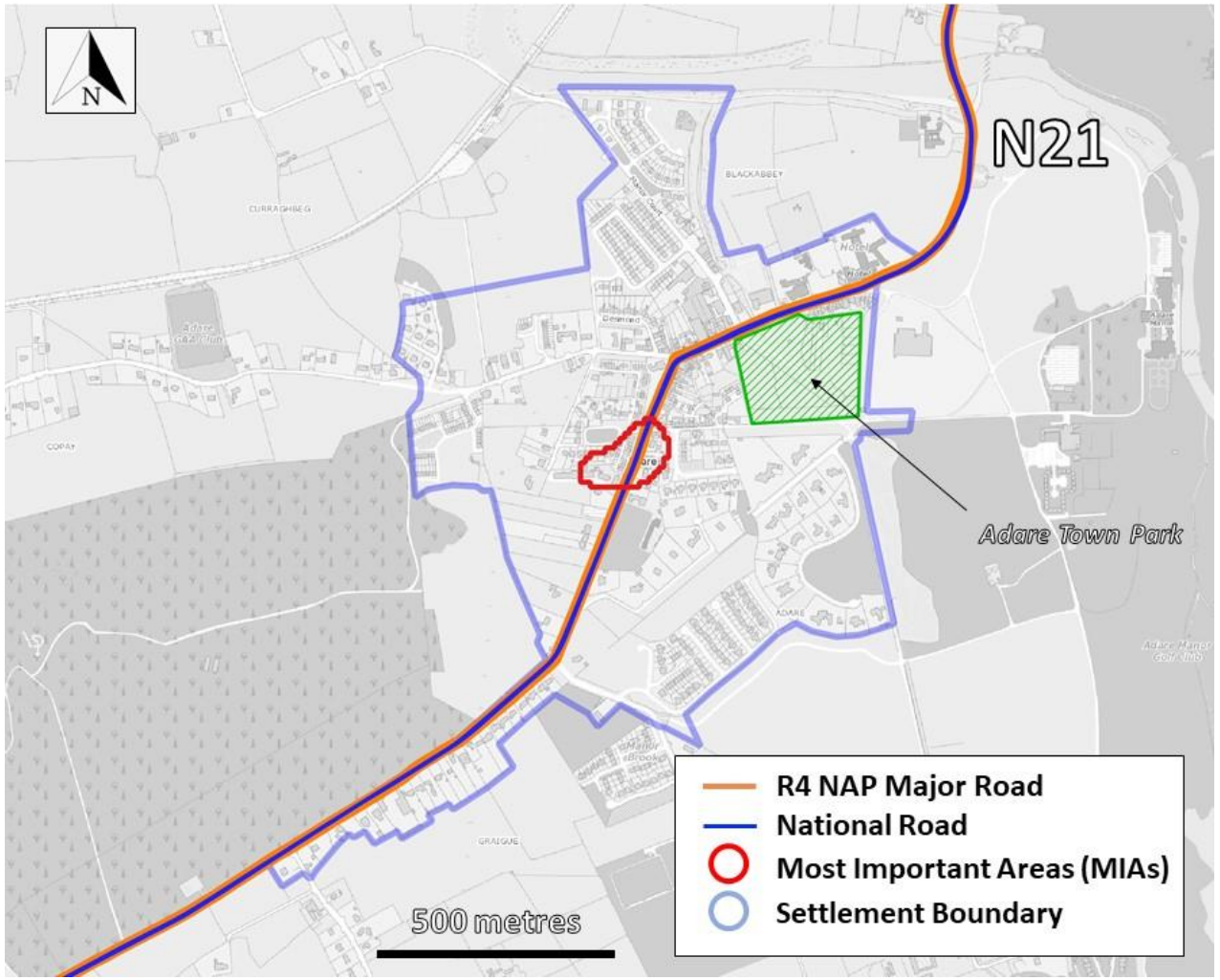


Figure 6.2. The Adare PIA with an MIA identified along the major road qualifying for strategic noise mapping (N21). ***The Adare Town Park is identified in the context of Candidate Quiet Areas in Section 7.6.4.***

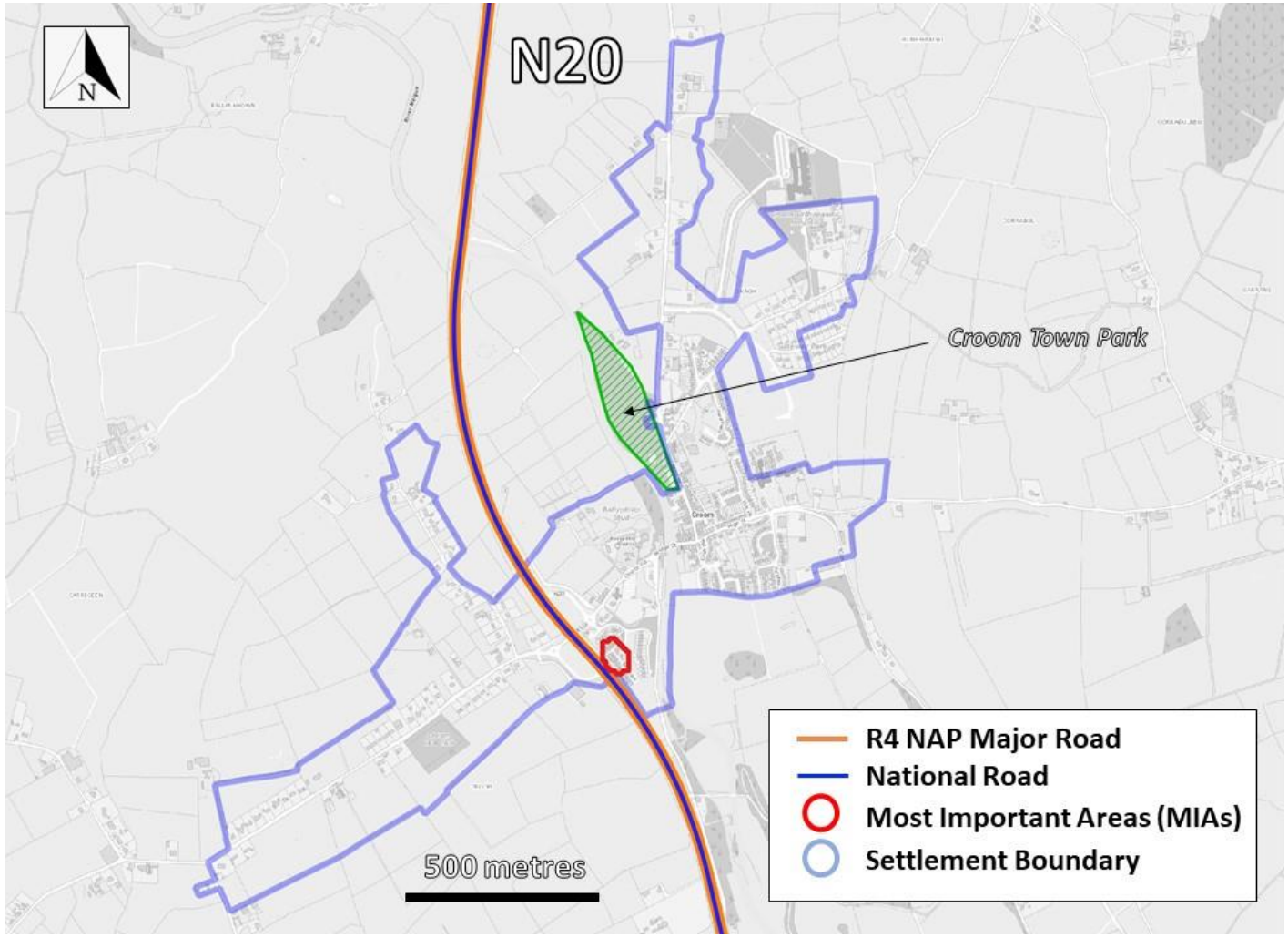


Figure 6.3. The Croom PIA with an MIA identified along the major road qualifying for strategic noise mapping (N20). **The Croom Town Park is identified in the context of Candidate Quiet Areas in Section 7.6.4.*

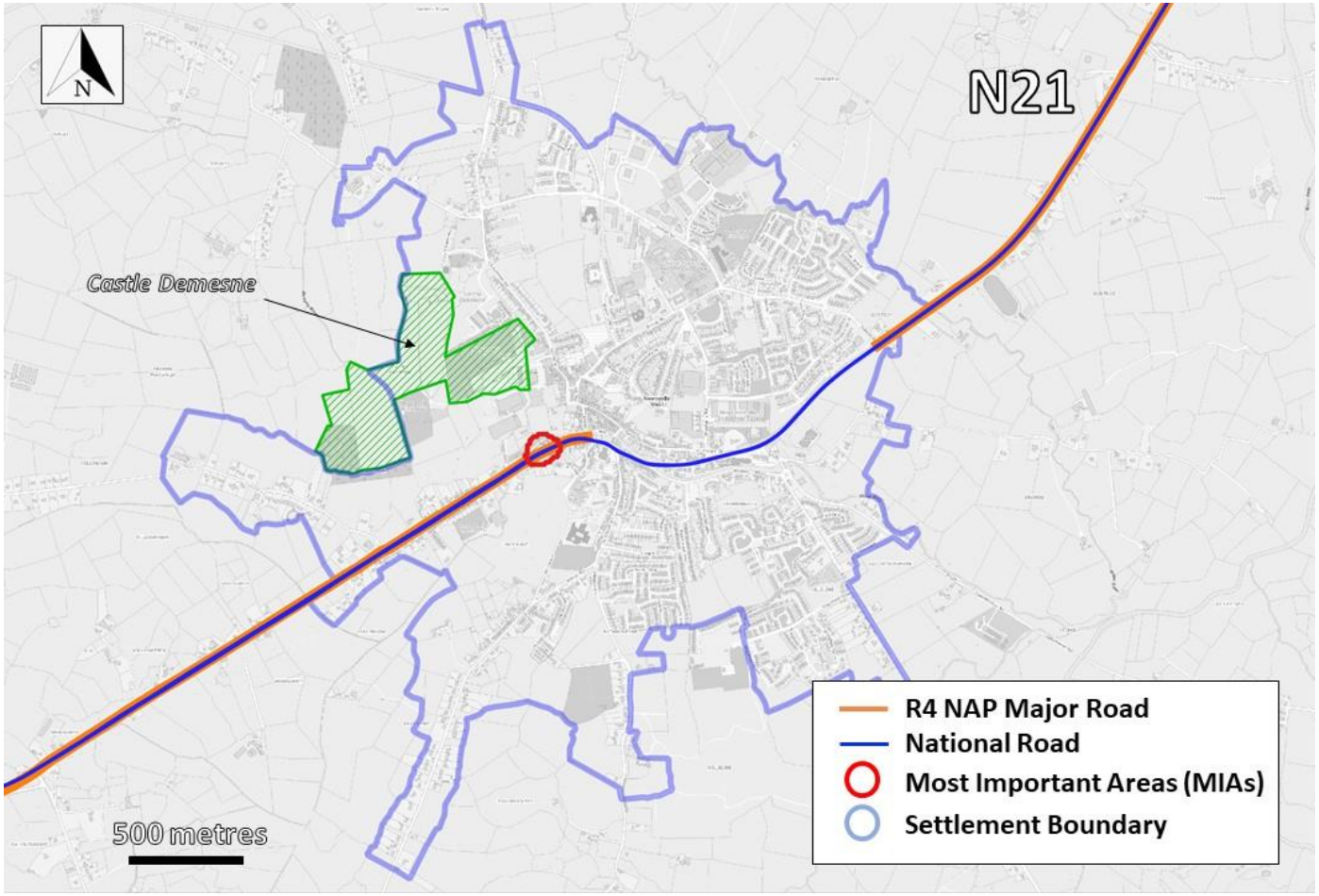


Figure 6.4. The Newcastle West PIA with MIA identified along the section of major road qualifying for strategic noise mapping (N21). To note, TII has indicated that the volume of traffic on the N21 through the town for the calendar year 2021 fell below the 3 million vehicle passages per day threshold qualifying for strategic noise mapping. **The Castle Demesne Park is identified in the context of Candidate Quiet Areas in Section 7.6.4.*

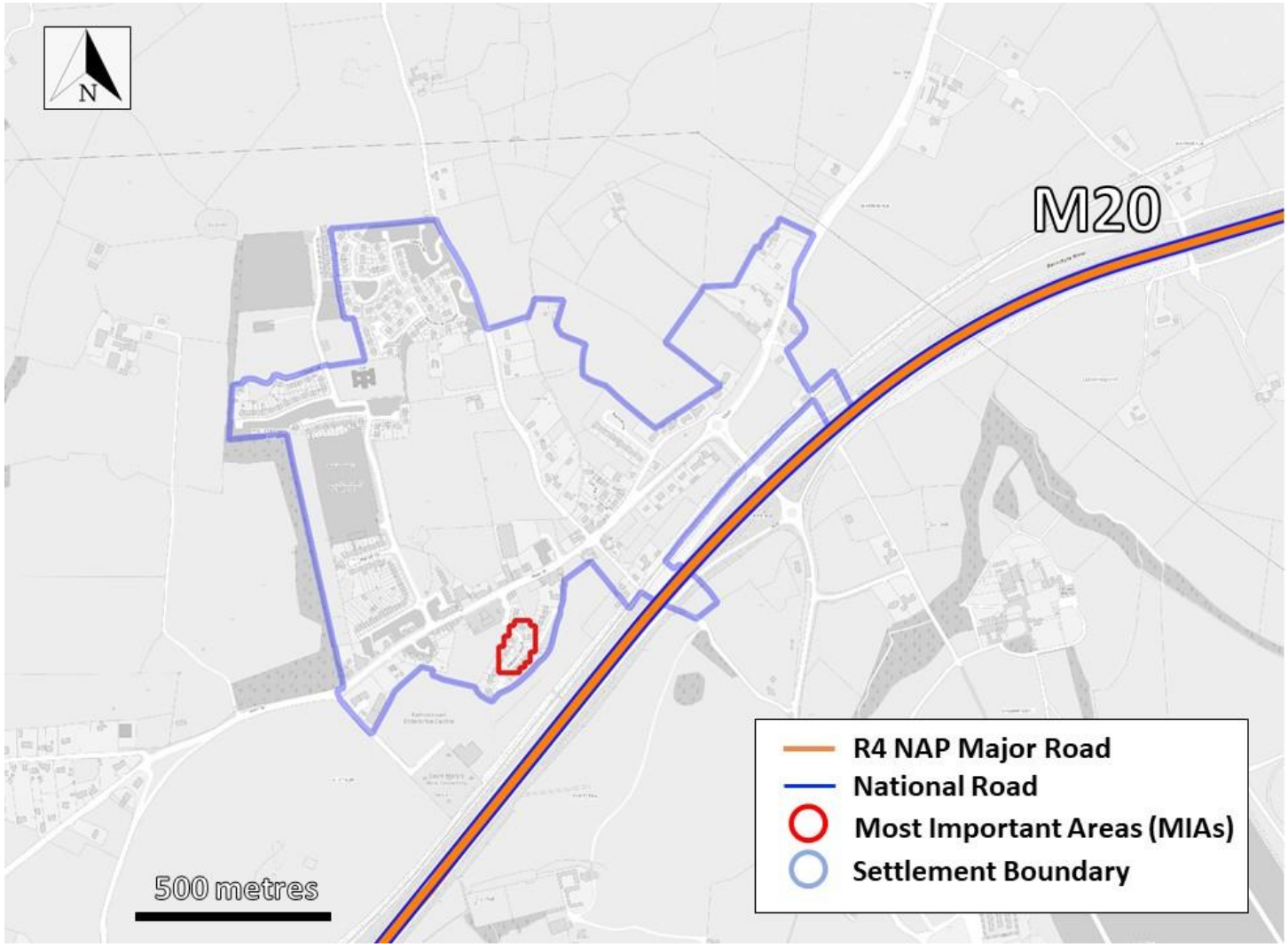


Figure 6.5. The Patrickswell PIA with an MIA identified adjacent to the major road qualifying for strategic noise mapping (M20).

Oola and Patricskwell were identified as noise hotspots (now termed PIAs) under the NAP 2018-2023, based on the use of a decision support matrix provided in the previous EPA Guidance (2009)[62]. A cost benefit assessment for the Oola hotspot (**Figure 6.6**) was not undertaken during the period of that NAP. Consequently, the area identified in **Figure 6.6** is considered as an additional PIA to be included in the NAP 2024-2028 even though the N24 passing through Oola has not been identified by TII as a section of major road (i.e. it did not qualify for Round 4 strategic noise mapping).

[62] Guidance Note for Noise Action Planning For the first round of the Environmental Noise Regulations 2006 (Updated 2009)

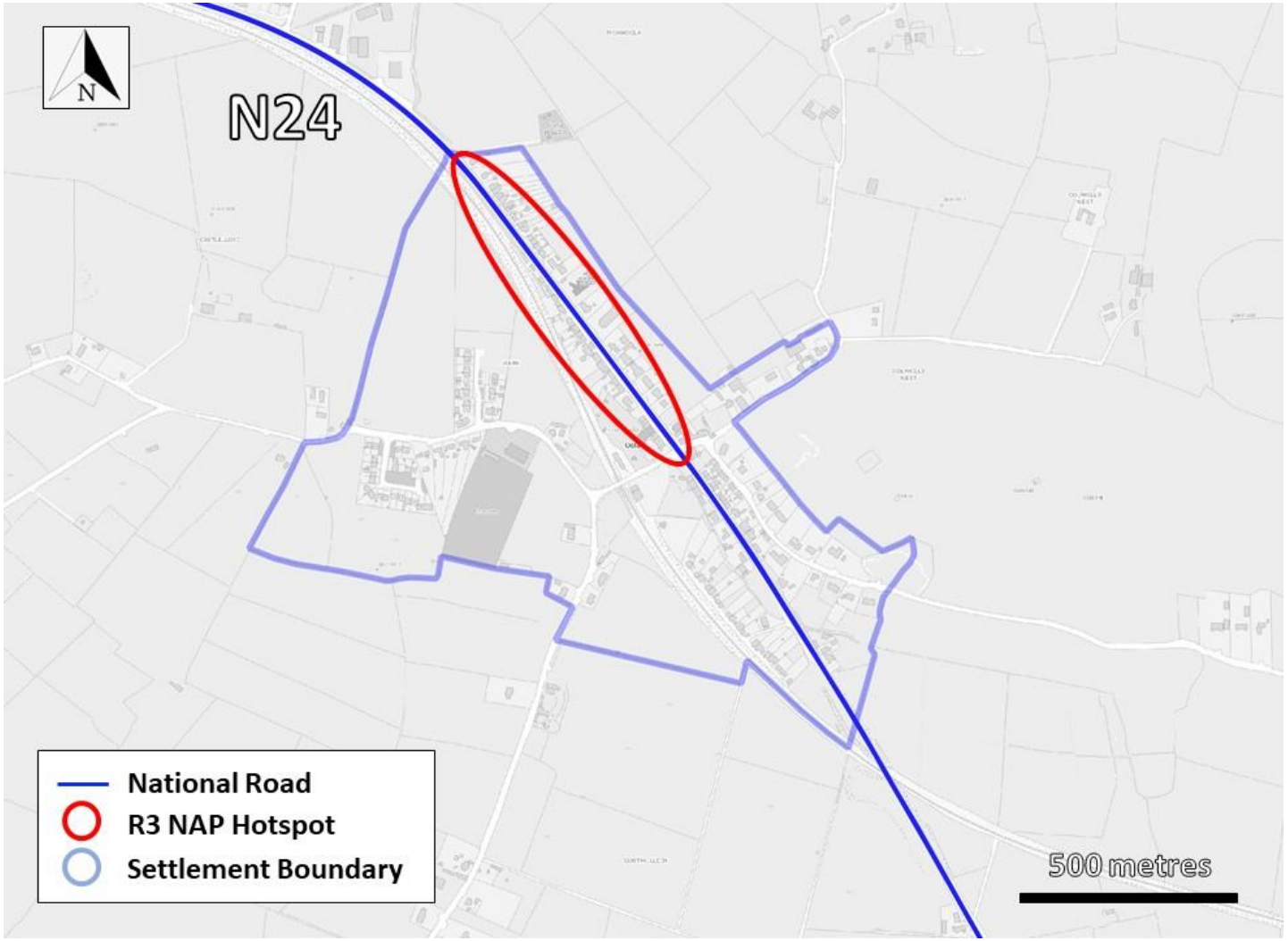


Figure 6.6. The Oola hotspot identified in the NAP 2018-2023 along the N24 road, identified as a PIA for the NAP 2024-2028.

7. Mitigation, Prevention and Protection Measures

7.1 Introduction

There are three types of approach in the NAP 2024-2028 for reducing exposure of the existing and future populations of County Limerick to undesirably high noise levels: mitigation, prevention and protection.

Mitigation refers to taking measures to reduce noise levels where members of the public are exposed to environmental noise levels that have the potential to be harmful to health and quality of life. Where noise levels are confirmed to be undesirably high in the selected PIAs (identified in **Section 6.3**) the Council will attempt to identify and evaluate measures to reduce the effects of noise exposure. However, it must be acknowledged that there is no dedicated national funding mechanism available for the implementation of measures that target noise mitigation through noise action planning. The implementation of measures in PIAs will be based on any proposed or scheduled road improvement works where practicable during the period of the NAP.

Prevention measures aim to avoid additional members of the population being exposed to undesirable noise conditions. In County Limerick, these will primarily take the form of planning policy in respect of proposed residential developments and other noise sensitive buildings (e.g. schools, hospitals) in potentially noisy environments, in particular adjacent to major roads, and also the consideration of noise where it might be excessive in the development of new public realm.

Protection measures relate to the preservation of favorably low environmental noise levels in publicly accessible areas, or areas that provide tranquility, for citizens and communities through the identification, investigation and designation of "Quiet Areas".

7.2 Mitigation

7.2.1 Management of Priority Important Areas (PIAs)

Where members of the population are exposed to long-term undesirable environmental noise levels, mitigation measures can be effective to some extent. Measures that may be considered along major roads generally will include alternative lower noise road surfaces (e.g. porous pavements), the construction of noise barriers and changes in traffic flows and speeds.

Six PIAs have been identified in County Limerick (**Figures 6.1** to **6.6**) for the investigation of potential noise mitigation measures:

1. Abbeyfeale (N21);
2. Adare (N21);
3. Croom (N20);
4. Newcastle West (N21);
5. Patrickswell (M20);
6. Oola (N24).

The variety of measures available are presented in the Road Traffic Noise Management Framework (**Figure 7.1**). The selection of the noise mitigation measure/s requires consideration of both its/their potential effectiveness in reducing noise exposure and harmful effects, and cost. The general steps in this process, which will be undertaken by the Council in consultation with the relevant authorities during the implementation of the NAP 2024-2028, are:

- Review of the assumptions used to identify the PIAs – a review of the basis upon which the PIAs were selected. This will likely include a review of the strategic noise modelling and model assumptions, such as road-surfacing type, and vehicle flows;
- Re-evaluation of PIAs – where the assumptions in the strategic noise modelling differ from those existing during the implementation of the NAP, appropriate re-evaluations will be undertaken. This may include noise modelling and/or noise measurements;
- Identification of practical noise mitigation options – the Council, in consultation with the relevant authorities will identify and agree on practical noise mitigation measures in relation to the PIAs. This engagement will include consideration of aspects such as planning, land-use and available technology;
- Appraisal of noise mitigation options by estimating the expected reduction in harmful health effects of noise exposure[63] and where appropriate estimating the monetised benefits to health to support the appraisal of mitigation measures – an assessment of the identified practical noise mitigation options, likely including detailed computational noise modelling. The estimation of monetised benefits to health may include the use of the UK WebTAG[64] workbooks. This process requires modelling of scenarios both for a year during the implementation of the NAP and a future year, typically 15 years ahead;
- Financial assessment of noise mitigation options where appropriate to support the appraisal of mitigation measures – determination of the estimated costs of implementing mitigation measures, taking into consideration costs over the lifetime of any measure, including construction and maintenance;
- Cost-benefit analysis where appropriate to support the appraisal of mitigation measures – a comparison of benefits to health versus the cost to implement the noise mitigation measure, presented as a cost-benefit ratio; and
- Recommendation of noise mitigation measure(s) – the Council in consultation with the relevant authorities and subject to resources and funding, will seek to implement the most appropriate noise mitigation measure(s).

[63] As required under the Environmental Noise (Amendment) Regulations 2021 (Section 5 - Amendment of Regulation 9 of the Environmental Regulations 2018, "Assessment Methods" of the Principal Regulations).

[64] https://www.gov.uk/government/publications/tag-unit-a3-environmental-impact-appraisal [accessed 9th February 2024]

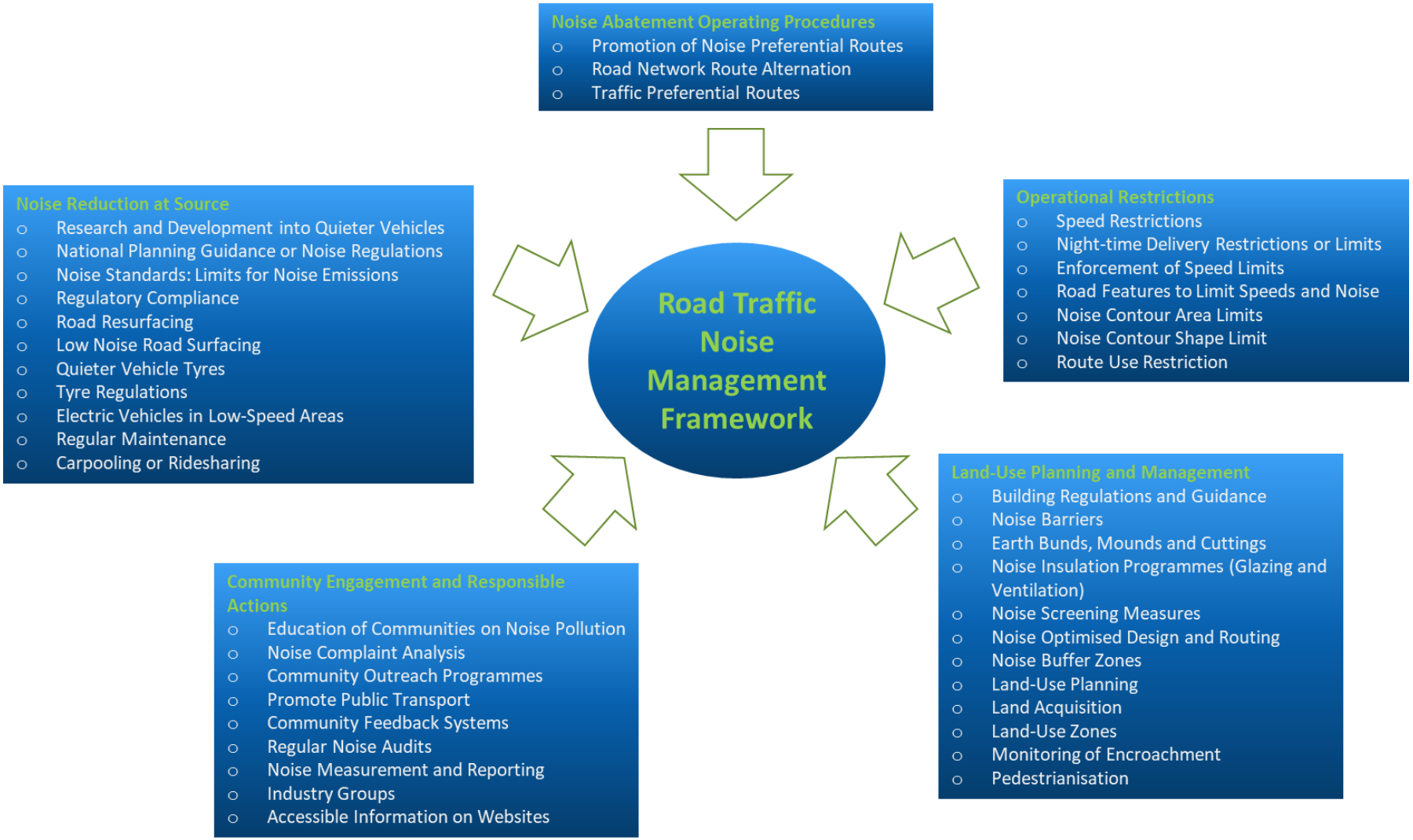


Figure 7.1. Road Traffic Noise Management Framework for noise mitigation measures.

7.2.2 Noise Sensitive Buildings

Noise sensitive buildings that qualified for strategic noise mapping and to be included in the NAP are listed in **Tables 5.5** and **5.6** including the long-term L_{den} and L_{night} levels they are expected to be exposed to at their most exposed façade from road noise.

The Environmental Noise Regulations, 2018, require that in the first instance that priorities shall address the most important areas. As discussed in **Section 6.1**, the EPA Guidance recommends that the identification of Most Important Areas (MIAs) is based on where adverse health effects on the population are potentially highest. Also, priorities may be identified based on the basis of exceedances of any relevant limit value or other relevant criteria. However, the equations set out in the Environmental Noise (Amendment) Regulations, 2021, are only appropriate to estimate potential adverse health effects at a community scale, not for individual noise sensitive buildings and no limit values exist. All that can be concluded is that the higher the outdoor long-term noise level a noise sensitive building is exposed to, the more undesirable that is[65]. The maximum noise level at the most exposed building façade may not be representative of noise levels around the entire building and that noise at that façade may not influence the long-term health of persons occupying the building. For example, the most exposed facade may not transmit sound into a noise sensitive room (the room may not be noise sensitive) or the sound insulation provided by the façade might be appropriate to provide a comfortable indoor acoustic environment[66].

In relation to reducing environmental noise at noise sensitive buildings the Council will support the implementation of plans, projects and strategies that will reduce traffic volumes along major roads through towns and settlements. Where any proposed new road project may have a negative influence, potentially increasing the exposure of noise sensitive buildings to environmental noise then Limerick City and County Council will engage with the relevant authorities and appraise noise mitigation options where feasible and recommend appropriate noise mitigation measure(s) if necessary. The variety of measures available are presented in the Road Traffic Noise Management Framework (**Figure 7.1**).

[65] L_{night} is not a relevant noise parameter to consider for schools because they are noise sensitive buildings that are generally occupied during the day-time.

[66] Recommended target indoor noise levels for noise sensitive buildings are set out in the WHO Community Noise Guidelines 1999 and the UK Department of Health Health Technical Memorandum 08-01: Acoustics).

7.2.3 Infrastructure Projects

Several major infrastructure projects are planned or being brought through the design development phase for County Limerick during the period of the NAP. While not their primary purpose they may influence the acoustic environment in County Limerick.

7.2.3.1 Strategic Impact of Foynes Port

Under the NDP2040 and the Government's National Port Policy the Shannon Estuary is recognised as being fundamental to Ireland's economic growth. Foynes is identified as a Core Port under EU Regulations (Trans European Network TEN-T). The TEN-T regulations require high-quality road connectivity. In meeting Ireland's future port capacity, the concentration of traffic through the Foynes Port is expected to increase substantially. The ongoing reinstatement of the Limerick to Foynes rail line and the Foynes to Limerick Road Improvement Scheme will support the expansion of the port.

The planned Foynes to Limerick Road Scheme was approved by An Bord Pleanála in August 2022 and also includes a bypass of Adare (**Figure 7.2**). The route of the bypass will be to the north of Adare and is expected to remove a substantial amount of vehicular traffic currently passing through the town, including a significant reduction in the number of heavy goods vehicles.

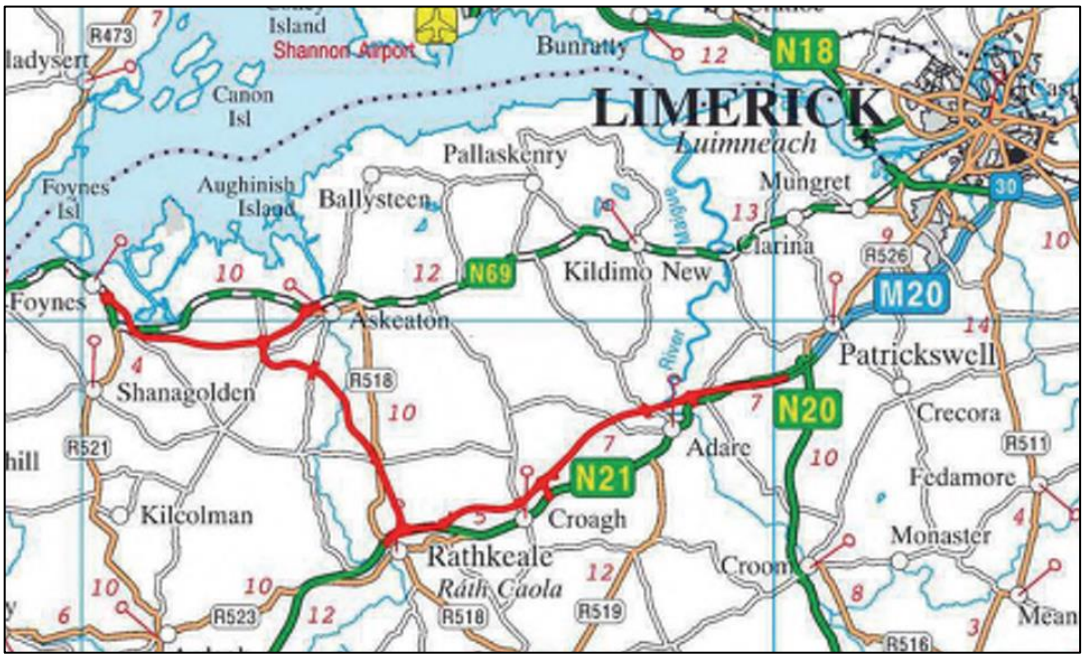


Figure 7.2. Planned route (red) for the Foynes to Limerick Road Scheme.

7.2.3.2 N21 Abbeyfeale Road Scheme

The Council is working in partnership with Kerry County Council, TII and the Department of Transport to develop a scheme to alleviate traffic congestion on the N21 Limerick to Tralee Road through Abbeyfeale. Consultants have been appointed to advance the project through the planning, design and statutory approval phases.

7.2.3.3 N/M20 Cork to Limerick Project (Northern Section)

The N/M20 Cork to Limerick Project is a key element in Project Ireland 2040. The Strategy comprises the National Planning Framework (NPF) to 2040 and the National Development Plan (NDP) 2021-2030. The NDP sets out that the N/M20 Cork to Limerick project would provide better connectivity between Ireland's second and third largest cities by improving the quality of the transport network. Consultants have been appointed to advance the project through the planning, design and statutory approval phases.

7.2.3.4 N21 Newcastle West Road Scheme

The Council is working in partnership with TII and the Department of Transport to develop a scheme to alleviate traffic congestion on the N21 Limerick to Tralee Road through Newcastle West. Consultants have been appointed to advance the project through the planning, design and statutory approval phases.

7.2.3.5 N24 Cahir to Limerick Junction Road Project

The Council is working in partnership with Tipperary County Council (lead authority), TII and the Department of Transport to develop the N24 Cahir to Limerick Junction Road Project. Consultants have been appointed to advance the project through the planning, design and statutory approval phases.

7.2.4 Other Relevant Measures

There are other measures being considered at a national level which could effect the acoustic environment in County Limerick and support the Council in the implementation of the NAP.

7.2.4.1 National Speed Limit Review (2023)

The Council will consider the adoption of any recommendations arising from the National Speed Limit Review and implement any changes required by legislation. Guidance is awaited from the Department of Transport.

7.2.4.2 ReGAIN

In light of continued concerns regarding the appropriate enforcement and resourcing of air and noise matters at a Local Authority level, the Programme for Government gives a commitment to *"Develop a regional approach to air quality and noise enforcement"*, termed ReGAIN (Regional Expert Groups for Air and Noise).

7.3 Prevention

Below are the approaches being taken by Limerick City and County Council to prevent future communities being exposed to the harmful effects of road-traffic related noise.

7.5.1 Introduction

In order to give effect to National Policy Objective 65 in respect of the management of noise and to prevent members of the community being exposed to undesirable noise levels, the Council takes a strategic approach to managing environmental noise within its administrative area.

All new applications for residential developments shall be assessed in accordance with the LDP objective TR O54 (Noise Sensitive Development) and where there is the likelihood of an adverse noise impact near major roads that planning applications should be supplemented by an Acoustic Design Statement carried out by appropriately qualified acousticians and competent persons. The Acoustic Design Statement should demonstrate that all facets of the 'Professional Practice Guidance on Planning and Noise: New Residential Developments' (ProPG) have been followed.

A healthy acoustic environment in the public realm depends on the environment noise level as well as a variety of subjective factors such as the intended use of space, the preferences of people, their expectations and their attitudes and sensitivity to the sounds they hear. The management of environmental noise in the public realm should have a broad focus, where practicable, with a consideration of noise levels as well as the need to create the right acoustic environment for the right time and place.

7.5.2 Professional Practice Guidance on Planning and Noise: New Residential Developments

ProPG provides a recommended approach in the development process in relation to noise affecting new residential developments and is guidance to be directed at acoustic practitioners.

There are two key stages in the approach:

Stage 1 - an initial noise risk assessment of the proposed site;
Stage 2 - a methodical consideration of four key elements.

An Acoustic Design Statement should be prepared to demonstrate that all facets of the guidance have been followed and to provide clarity for decision makers in the planning process. A summary of the overall ProPG approach is provided in **Figure 7.3**.

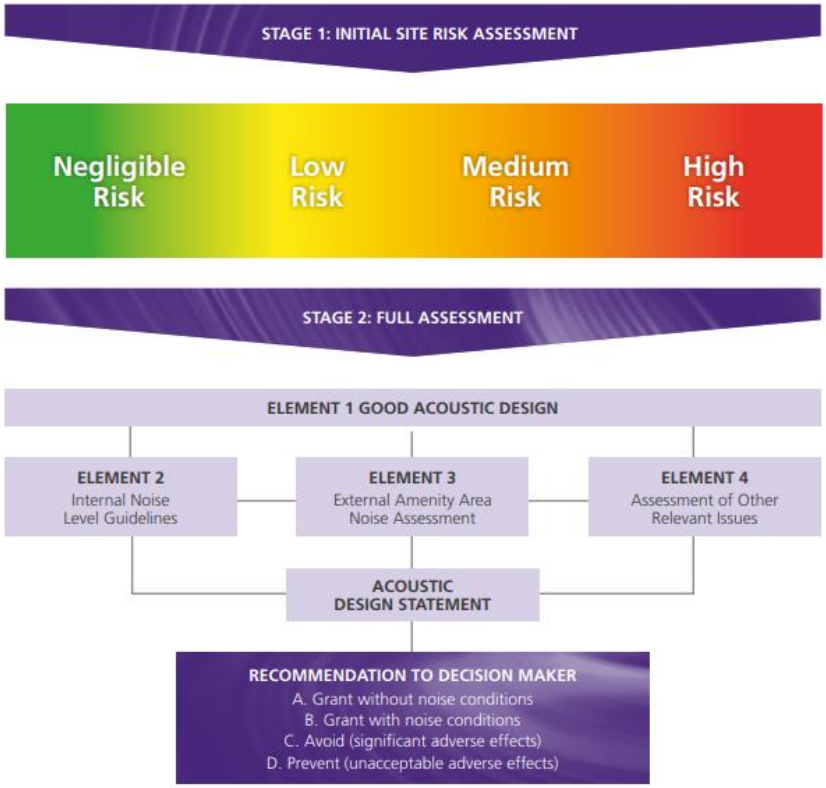


Figure 7.3. Summary of the overall ProPG approach.

The two stages of assessment are described below.

7.5.2.1 Stage 1: Initial Site Noise Risk assessment

The initial noise risk assessment should provide an indication of likely risk of adverse noise conditions on-site, not including any potential mitigation measures. The assessment should include only existing site features and those that are proposed to remain. It should be based on measurement and/or prediction and should assess free-field noise levels from the transport source (and potentially industrial or commercial sources) over a "24 hour" period for the worst case scenario of a particular site. **Figure 7.4** summarises the Initial Site Noise Risk Assessment.

The assessment is not the basis for an eventual planning recommendation, rather to provide an early indication of the suitability of the site. The approach allows noise issues to be identified that need to be addressed by the application of good acoustic design principles.

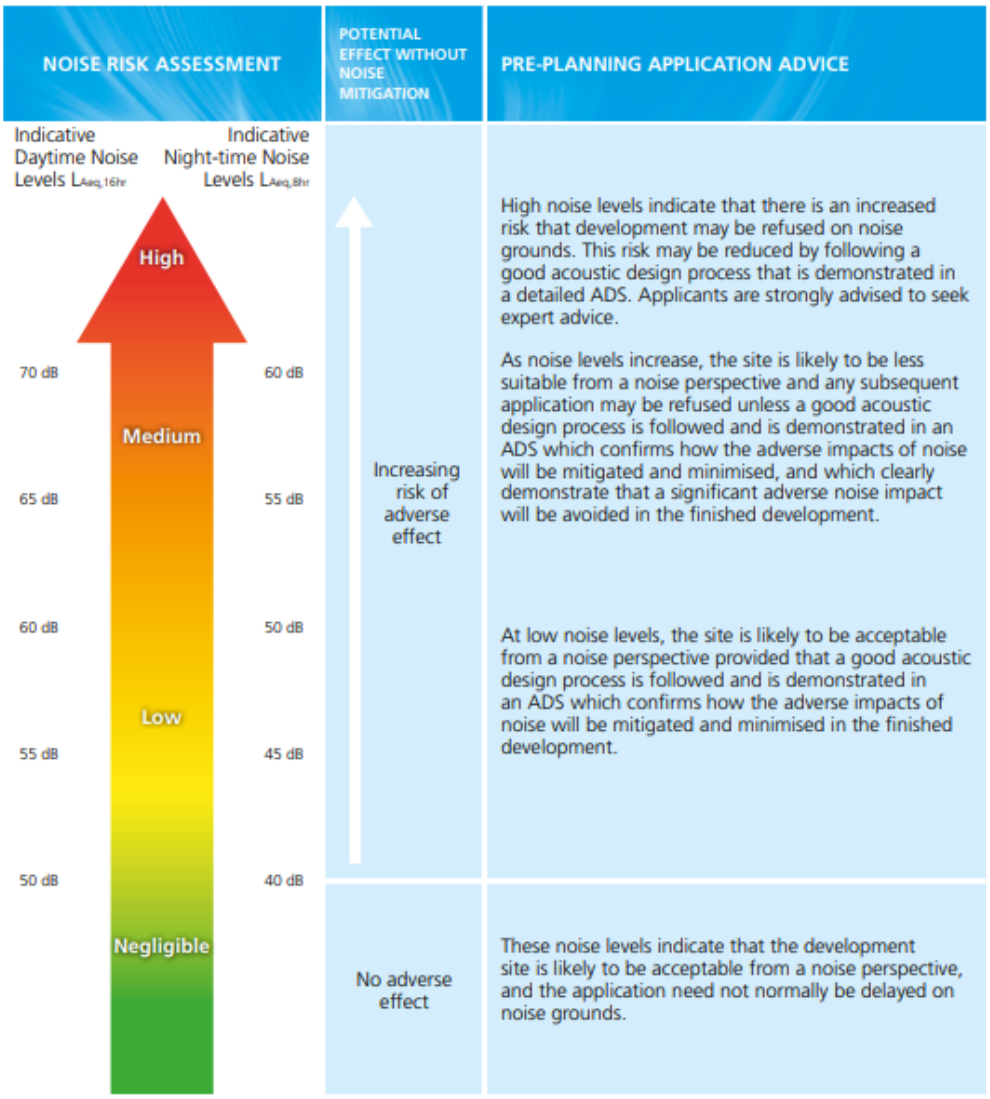


Figure 7.4. Stage 1 – Initial Site Noise Risk Assessment.

7.5.2.2 Stage 2: Full Assessment

The four key elements to be undertaken are described below:

Element 1 – Good Acoustic Design Process

Good acoustic design needs to be considered at the earliest stage of the development design and planning process. The feasibility of relocating or reducing noise levels caused by transport sources should be considered where identified by the Stage 1 noise risk assessment. Good acoustics design takes an integrated approach to achieve optimal internal and external acoustic conditions e.g. by site layout or building orientations. A key is to avoid "unreasonable" acoustic conditions where compromises in design will adversely affect the quality of life for residents.

Element 2 – Internal Noise Levels

Suitable guidance on internal noise levels is provided in *"BS 8233:2014: Guidance on sound Insulation and Noise Reduction for Buildings".* Target internal noise levels are given in the standard and are summarised in **Table 7.1**.

Table 7.1. ProPG Internal Noise Level Guidelines (additions to BS8233:2014 shown in blue).

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\,hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\,hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\,hr}$	30 dB $L_{Aeq,8\,hr}$ 45 dB $L_{Amax,F}$ (Note 4)

The target levels are long-term averages, having cognisance that acoustic conditions can change from day-to-day.

Element 3 – Noise Assessment of External Amenity

BS 8233:2014 requires that internal noise levels should not be considered in isolation. ProPG indicates that where external amenity spaces are an intrinsic part of the overall design of a development then those spaces should be enjoyed as intended. In general, this means limiting external noise levels to $L_{Aeq\ 16hr} \leq 50$dB.

Element 4 – Other Relevant Issues

Relevant national, regional and planning and noise policies should be assessed on deciding on the suitability of the acoustic conditions of the development. This assessment may involve looking at the likely occupants of the proposed development, potential future occupancy changes, and their vulnerability and sensitivity to noise. Additionally, design measures might have unintended adverse affects, such as sealed up balconies that result in a lack of connection with the external environment. The guidance requires that unintended adverse effects should be avoided.

7.5.3 Noise and Public Realm

Early input in the design of public spaces by considering the acoustic environment (and air quality because the emission source is often the same) offers the opportunity to maximise the benefits of taking an integrated approach to design.

In designing public spaces to maximise the contribution in terms of reducing environmental noise and improving the quality of sound (and improving air quality), then consideration should be given to measures including:

- using novel environmentally friendly methods (e.g. HOSANNA: European Union Seventh Framework Programme, FP7/2007–2013) such as barrier designs, the appropriate planting of trees, shrubs, or bushes, ground and road surface treatments, and greening of building façades and roofs (e.g. **Figure 7.5**);

- pedestrianising streets and the use of green infrastructure to reduce the likelihood of citizens being present in locations where air and noise pollution are highest, and creating attractive, accessible places where pollution levels are lower;
- providing options for active travel along routes other than beside busy roads, making walking and cycling increasingly attractive alternatives to private vehicle use. This will reduce citizens exposure to air and noise pollution, and potentially vehicular emissions;
- providing and protecting tranquil outdoor environments and positive acoustic environments. This may reduce annoyance for citizens living in close proximity to busy roads and ensure people have options other than being indoors when they want to enjoy respite from noise;
- encouraging exercise and other outdoor recreation to improve citizens health and well-being due to health risks posed by air and noise pollution;
- providing alternative acoustic interventions to create new positive types of sounds that mask environmental noise;
- education and awareness of the quality of sound in our public realm by undertaking soundwalks e.g. using the Hush City app (see **Sections 3.4.2** and **7.4**).

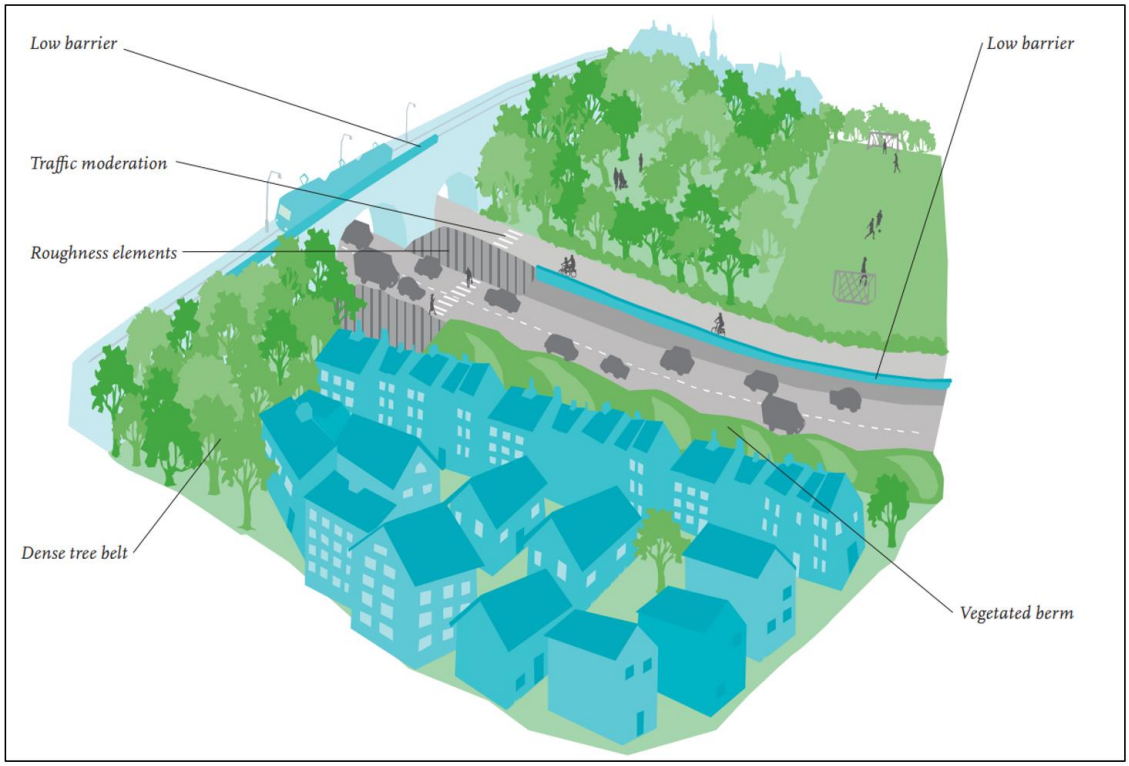


Figure 7.5. Example of combining solutions in areas exposed to road traffic and railway noise[67].

[67] http://www.hosanna.bartvanderaa.com/index.php?id=1 [accessed March 2024]

The level of effort in respect of creating appropriate acoustic environments shall be proportionate to the level of opportunity presented by a proposed development to result in better place-making. This will depend on the nature and scale of the proposed development and on the local context.

7.4 Protection

The Council will consider designation of "Quiet Areas" during the period of the NAP, as recommended under the Environmental Noise Regulations and collect evidence to submit to the EPA for consideration in consultation with the Minister.

At present there is no universally accepted definition by EU Member States[68] of what constitutes a Quiet Area. However, they are regarded as areas where environmental noise levels are deemed to be low and should therefore be protected from the potential impacts of new developments.

In acknowledgement of the lack of standard approach for the identification of Quiet Areas across Member States, the identification and evaluation of Quiet Areas in Ireland have been shaped by the national policy approach, definitions, and EPA research.

The EPA Research Program is a Government of Ireland initiative funded by the Department of the Environment, Climate and Communications, with aims of improving the health and well-being of the Irish population. The EPA research identified evidence for direct positive relationships between the presence of green and blue spaces with health indicators including self-reported health, mortality and disability. The EPA Guidance defines 'green spaces' in the context of the identification of areas which could be considered a Candidate Quiet Area (a candidate for an application for Quiet Area designation by the Minister).

7.6.1 EPA Criteria for Quiet Areas

The EPA describe Candidate Quiet Areas (CQAs) for the application of formal Quiet Areas as one of two categories:

- **Absolute quiet areas:** where environmental noise levels are low and should be preserved; or
- **Relative quiet areas:** where environmental noise levels are relatively low in comparison to community noise exposure outside of the quiet area.

The traditional criteria used in Ireland has been to identify Absolute Quiet Areas as areas with environmental noise levels below 55 dB L_{den}[69]. However, the L_{den} parameter has the potential to be dominated by the weighted night-time noise level when the communities use of those areas is likely to occur in the day-time. Absolute CQAs are described by the EPA to now have a representative noise level less than 50 dB $L_{Aeq,16hr}$.

[68]European Parliament, Towards a comprehensive noise strategy, Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy, 2012

[69]EEA Report No 14/2016, Quiet Areas in Europe – The environment unaffected by noise pollution.

Relative Candidate Quiet Areas are areas with a noise level which is more than 10 dB[70] lower than the noise exposure experienced by more than 25% of the population living within 1,000 metres.

It has not been possible to undertake a desktop exercise to review expected environmental noise levels across publically accessible green and blue spaces in County Limerick because the Strategic Noise Maps only relate to major roads and many of these areas are away from heavily trafficked transportation routes. Areas in County Limerick to be investigated under this NAP to determine their appropriateness to be CQAs (areas for application as formal Quiet Areas) are termed below as Potential Candidate Quiet Areas (PCQAs).

7.6.2 Citizen Science and Soundscape Approach to Designating Quiet Areas

It is acknowledged that the soundscape (people's perceived response to the acoustic environment) of green and open spaces can benefit people's mental health. These are areas that facilitate walks, child play and other leisure activities that promote social interaction and positive emotions.

Areas that provide calm and tranquillity do not necessarily have low measured sound pressure levels though. For example, water flowing in a river might cause high sound pressure levels. There is a need at a European policy level for guidance on how to integrate the subjective nature of quietness in public places with the environmental noise management approach (based on measured sound pressure levels).

The Hush City participatory framework[71], developed by Dr. Antonella Radicchi, was developed to address this gap. The framework is based on three pillars: (1) the soundscape concept; (2) the use of citizen science mobile technology as a medium for participation in the mapping and assessing of quiet areas; and (3) the idea that quiet areas are urban commons, defined as "everyday quiet areas" i.e. that quiet areas should be considered as natural resources accessible to everyone in society. As per this framework, data can be collected using the Hush City app, a free novel mobile application that was launched in 2017, which empowers citizens to map and assess quiet areas and share their location and related data on an open access platform, either individually themselves or by soundwalks[72] led by a moderator.

The app allows the sequential collection of a mixture of data by a user in a location over a short timeframe (approximately three minutes). That data includes an audio recording and associated sound pressure level, an image of the location where the sound was recorded and user feedback at that same location (**Figure 7.6**). User feedback is collected

[70] A difference of 10 dB have been used because it represents a 10-fold decrease in sound intensity and an approximate halving in perceived loudness, therefore a contributing factor to relative perceived quiet.

[71] https://opensourcesoundscapes.org/hush-city/ [accessed 9th February 2024]

[72] Soundwalks are a participatory group sound and listening walks through the environment. Soundscape analysts observe and measure the perceptual responses of the participants to the acoustical, visual, aesthetic, geographic, social and cultural differences.

through a predefined questionnaire structured in three sections on the soundscape, general and behavioural issues and questions are designed to explore the relationship between the soundscape and topics regarding emotional responses, semantic descriptors, the perceived quietness, positive and negative sounds, oral and social interaction, sense of place, landscape quality, level of maintenance and cleanliness, sense of security and a location's accessibility.

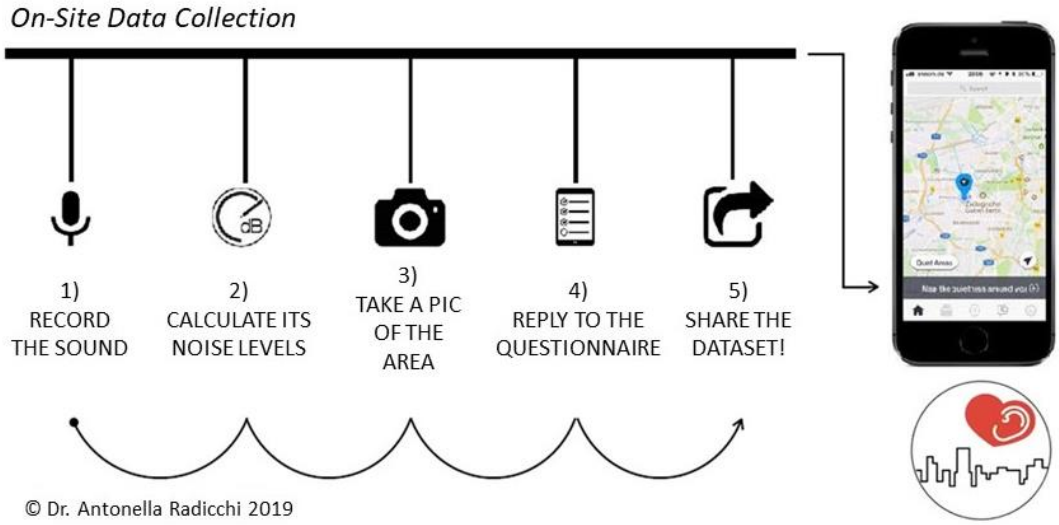


Figure 7.6. The sequential collection of data to investigate quiet areas with the Hush City app. The app is available at the weblink https://opensourcesoundscapes.org/hush-city/.

Engaging with communities to assess quiet public locations using a soundscape approach offers an opportunity to involve the public in the decision-making process for identifying, evaluating and potentially designating Quiet Areas and to provide evidence to support an application for Quiet Area designation where the criteria in the EPA Guidance might not be met.

7.6.3 Lough Gur Potential Candidate Quiet Area

Lough Gur is a site of international significance due to the area's rich archaeology and environment. The lake is the only natural lake of significance in south-east Limerick and is a tourist attraction for its beauty and tranquillity (**Figure 7.7**).

Figure 7.7. View at the edge of Lough Gur, besides the Visitors Centre.

The Council has undertaken a significant amount of sound pressure level monitoring besides the lake at the Lough Gur Visitors Centre in recent years. The L_{den} results between 2021 and 2023 (52 dB to 54 dB) meet the traditional criteria used in Ireland for Quiet Areas for previous rounds of noise action planning (< 55 dB L_{den}). However, the $L_{Aeq,16hr}$ results (average day- and evening-time) between 2021 and 2023 (50 dB to 52 dB) are marginally above the latest recommended EPA criteria (< 50 dB $L_{Aeq,16hr}$). The measured long-term sound pressure levels are higher than expected, most likely due to natural sounds and wildlife e.g. wind-induced noise from nearby trees and vegetation, birdlife etc..

During the period of the NAP the Council will continue to investigate the site of the Lough Gur Visitors Centre as a Potential Candidate Quiet Area (PCQA) and further investigations shall include a citizen science and soundscape approach.

7.6.4 Limerick Parks - Potential Candidate Quiet Areas (PCQAs)

The Council will investigate sound in parks in County Limerick over the period of the NAP 2024-2028 and future iterations of NAPs based on the evidence of EPA research. Over the period of this NAP the Council will begin the assessment of three principal parks in the County as PCQAs. These are Adare Town Park (**Figures 6.2** and **7.8**), Castle Demesne Park (**Figures 6.4** and **7.9**) and Croom Town Park (**Figures 6.3** and **7.10**). Over the duration of the NAP the Council will explore funding opportunities for the measurement of sound, undertaking the assessment of sound pressure levels and soundscapes in collecting evidence to establish the appropriateness for the application of the parks to be designated as Quiet Areas.

The Council will also work with local communities and bodies where feasible during the period of the NAP to identify and assess community-managed open green spaces that may benefit from Quiet Area designation e.g. the Abbeyfeale Town Park (**Figures 6.1** and **7.11**).

Figure 7.8. Adare Town Park.

Figure 7.9. Castle Demesne Park, Newcastle West.

Figure 7.10. Croom Town Park.

Figure 7.11. Abbeyfeale Town Park.

7.6.5 Quiet Area Designation and Other Work Programmes

Where an appropriate benefit is determined from investigations of the PCQAs then applications will be forwarded to the EPA for consideration in consultation with the Minister, with successful applications resulting in a delimitation of Quiet Areas.

Engagement with the public will also be used where appropriate to raise awareness within the Council to feed into work programmes and strategies such as:

- **recreation and public realm** – local designation of "everyday quiet areas" as well as targeting infrastructural improvements based on demographics to provide social and environmental justice;
- **green and blue infrastructure** – aid the design of quiet spaces based on novel green solutions;
- **active travel** – identifying and raising awareness of low noise routes and demonstrate their benefit in comparison to more noisy (busily trafficked) routes to promote and allow the public make educated decisions on their active travel journeys around the City;
- **tourism** – identifying and raising awareness of low noise destinations in Limerick.

The benefit to the public using a citizen science and soundscape approach is that they can share with the local authority their experiences, perceptions and preferences which can aid the Council in decision-making from the earliest stages of projects.

8. Public Consultation

The Council is responsible for the preparation and implementation of the NAP 2024-2028 for all major roads in the County, outside of the Limerick Agglomeration.

The Draft County Limerick NAP 2024-2028 will be made available for public consultation for a six week period, from 5th April to 17th May 2024. Notice of the public consultation will be advertised in the Limerick Leader and Limerick Post for two consecutive weeks. Hard copies of the plan will be placed on display at:

- Limerick City and County Council, County Hall, Dooradoyle Limerick,
- Limerick City and County Council, City Hall, Merchants Quay, Limerick;
- Newcastlewest Area Office, Newcastle West, Limerick;
- Rathkeale Area Office, Rathkeale, Limerick;
- Limerick County Library, Dooradoyle, Limerick;
- Limerick City Library, Barrow House, Michael Street, Limerick.

In addition, the Draft County Limerick NAP 2024-2028 is available through the Limerick City and County Council mypoint website:

https://mypoint.limerick.ie/

Submissions can be made to **noiseactionplan@limerick.ie** or in writing at:

Senior Executive Scientist
Environment and Climate Action
Limerick City and County Council
County Hall
Dooradoyle Road
Dooradoyle
Limerick
V94 WV78

Other contact details:
Tel: **+353 61 556000**
Fax: **+353 61 415266**
Email: **customerservices@limerick.ie**

9. Long-term Strategy

9.1 Noise Action Plan Commitments

It is the goal of the Council to adopt a strategic approach to the management of environmental noise with a view to preventing and reducing environmental noise where practicable, particularly where exposure levels may induce harmful effects on human health. The Council will also aim to preserve desirable noise environments where these are of amenity value to the public.

The NAP 2024-2028 is supported by a four-year programme for implementation (2024-2028), with progress reported to the EPA on an annual basis. The NAP is underpinned by a set of overarching noise policy principles outlined in the **Noise Policy Statement**. These noise policy principles are supported in Limerick Development Plan 2023-2028 and a series of commitments below (Implementation Actions).

9.2 Noise Policy Statement

Limerick City and County Council will adopt a strategic approach to managing environmental noise, within its administrative area, and will aim to:

- **Mitigation –** identify appropriate mitigation measures to reduce noise levels where they are potentially harmful to the health of communities.
- **Prevention** - prevent additional members of the community being exposed to undesirable noise levels where it is likely to have a significant adverse impact on health and quality of life, and where practicable, improve or maintain the quality of sound in the public realm.
- **Protection** - protect areas which are desirably quiet, or which offer a sense of tranquillity through a process of identification and validation followed by formal designation of “Quiet Areas”.

9.3 Implementation Actions

The implementation of the NAP spans a four-year time frame, beginning in 2024. Limerick City and County Council (LCCC) commits to a series of Implementation Actions during current and future noise action planning. The environmental noise management measures within the framework are presented across the three policy principle categories covered by the Noise Policy Statement, together with a fourth supporting ‘General’ category as follows:

- General – Noise Management Measures;
- Mitigation – Noise Management Measures
- Prevention – Noise Management Measures;
- Protection – Noise Management Measures.

The General noise management measures cover a range of activities to support the implementation of the NAP including other measures across the three policy principle categories. Mitigation measures relate to activities to support the investigation of noise abatement measures in the Priority Important Areas and engagement with the

relevant stakeholders with influence to implement them. Prevention measures relate to activities to support planning where there may be proposals to bring people to noise from major road sources or there is a material consideration of environmental noise required in the development of plans, strategies, policies and objectives. They also relate to maintaining or improving the acoustic environment for new public realm where feasible. Protection measures relate to the protecting the acoustic environment where environmental noise does not dominate.

In some instances measures do not necessarily stand in isolation and may be relevant, or overlap, with other categories. When considering the broader framework of measures and actions aimed at mitigating exposure to environmental noise from the roads, it is important to emphasise that Limerick City and County Council, in some instances, does not have exclusive ownership or influence over certain noise sources, areas, and the measures presented in this NAP. Many of the measures and actions will require input, collaboration, and execution by other authorities with responsibility for infrastructure, along with support from government departments and bodies through relevant legislation and funding.

In addition to third-party collaboration, the successful implementation of this NAP will also depend on the availability of adequate resources to execute the proposed measures and actions.

The measures across each of the four categories are summarised in **Table 9.1** with further detail presented in **Appendix E**.

Table 9.1. Noise Management Framework – Summary of measures.

Measures		Summary Actions	Time Scale
Noise Action Plan 2024-2028 Preparation			
	Noise Action Plan Finalised		18th July 2024
General - Noise Management Measures			
LCCC1.1	Noise Action Plan Working Group(s) – Action Planning Authorities and Noise Mapping Bodies	Support the establishment, terms of reference and membership for a Noise Action Plan Implementation Working Group. Hold meetings twice yearly or more frequently as matters require.	Short-term
LCCC1.2	Support the development of national and other related policy and guidance	Support the Department of Environment, Climate and Communications and other government departments and bodies in the development of national noise and other related policies and guidance, and assist in their implementation once in place.	Short-term
LCCC1.3	Report to the Environmental Protection Agency (EPA)	Prepare an annual progress report regarding the implementation of the NAP and submit it to the EPA.	Annual
LCCC1.4	Continued investigation and management of complaints	Review and investigate all noise complaints received in line with the Customer Charter and in accordance with national and international best practice.	Ongoing
LCCC1.5	Stakeholder collaboration	Liaise and collaborate with a range of key stakeholders to address noise-related issues to ensure the effective management of noise from related infrastructure.	Ongoing
LCCC1.6	Community engagement	Publish the final NAP and provide updates on the progress made with its implementation, including the findings of the appraisal of PIAs and evaluation of PCQAs on the LCCC and CCC websites. This information will also be communicated through ongoing engagement in Strategic Policy Committee meetings.	Ongoing
LCCC1.7 -	Manage and maintain the ambient noise monitoring network	Review the need for expansion of the City online noise monitoring network into the County in accordance with the needs or monitoring requirements of this NAP and other projects.	Ongoing

Table 9.1 (Continued). Noise Management Framework – Summary of measures.

Measures		Summary of Actions	Time Scale
Mitigation - Noise Management Measures			
LCCC2.1	Existing plans, projects and strategies	Collaborate with relevant internal LCCC and CCC sections and third party organisations to support the implementation of the following: • Active Travel Programmes; • LSMATS; • Climate Action Plans.	Short- to Long-term
LCCC2.2	Noise sensitive buildings	For relevant plans, projects and strategies liaise with appropriate internal Council Sections and/or third party organisations to ensure consideration given to good acoustic design principles to mitigate noise at noise sensitive buildings (e.g. Colbert Quarter St. Joseph's Hospital Draft Masterplan Report, Limerick).	Medium- to Long-term
LCCC2.3	Review assumptions used for Priority Important Areas (PIAs)	Undertake a review of the Strategic Noise Maps for the PIAs and the assumptions used in the calculation models.	Short-term
LCCC2.4	Appraise noise mitigation measures for PIAs	Where the PIA relates to infrastructure that is exclusively the responsibility of and managed by LCCC, then the evaluation will be completed exclusively by LCCC. Where the PIAs relate to infrastructure for which a third party organisation has overall responsibility, then the evaluation will require significant input from the relevant infrastructure owner. Appraisals should review the potential reduction in harmful effects (as required under the Environmental Noise Regulations, 2018)	Short- to Long-term
LCCC2.5	Implementation of recommended noise mitigation measures	Liaise with relevant internal LCCC Sections, third party organisations, and government departments to secure funding for noise mitigation measures. Implement the measures for which LCCC has responsibility and support third party organisations in the implementation of their measures.	Short- to Long-term
Prevention – Noise Management Measures			
LCCC3.1	Planning referrals	Report on planning applications and enforcement of planning conditions in relation to noise emissions in the context of Strategic Noise Maps and the NAP.	Ongoing
LCCC3.2	Support the development of local authority policies and objectives	In preparation of plans, strategies, local policies and objectives give due consideration to the NAP to support them.	Ongoing
LCCC3.3	Support the development of new public realm and green and blue infrastructure	Support the implementation of new public realm and green and blue infrastructure where feasible to provide appropriate acoustic environments for citizens health and well-being.	Short- to Long-term

Table 9.1 (Continued). Noise Management Framework – Summary of measures.

Measures		Summary of Actions	Time Scale
Protection - Noise Management Measures			
LCCC4.1	Evaluation of Potential Candidate Quiet Areas (PCQAs)	For each PCQA carry out an investigation of the area and make a recommendation on whether to designate each area as a Quiet Area or not.	Ongoing
LCCC4.2	Proposal for Quiet Areas(s) designation	For all CQAs recommended for designation, prepare proposal for EPA consultation and Ministerial Approval.	Annual
LCCC4.3	Develop and implement strategy for a citizen science and soundscape approach to investigating PCQAs	In relation to Measure LCCC4.1 evaluate the soundscape of PCQAs through a visitor experience and stakeholder engagement process (e.g. soundwalks), correlating citizens perceived responses of their acoustic environment with measured acoustic parameters.	Short-term

Appendix A: Glossary

Noise is defined as unwanted sound. Human hearing is able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used, which reduces the importance of lower and higher frequencies in a similar manner to human hearing.

The weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) according to the parameter being measured. The Glossary explains the acoustic terminology that is used in this Report. The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions. An indication of the range of sound levels found commonly in the environment is given in **Table A.1**.

Table A.1. Typical sound levels found in the environment.

Sound Pressure Level, dB(A)	Location
0	Threshold of hearing
20 to 30	Quiet bedroom at night
30 to 40	Living room during the day
40 to 50	Typical office
50 to 60	Inside a car
60 to 70	Typical high street
70 to 90	Inside factory
100 to 110	Burglar alarm at 1m away
110 to 130	Jet aircraft on take off
140	Threshold of pain

The subjective response to a noise is dependent not only upon the sound pressure level and its frequency, but also its intermittency. Various indices have been developed to try and correlate annoyances with the noise level and its fluctuations. The indices and parameters used in this report are defined below:

A-weighting A frequency weighting applied to measured or predicted sound levels in order to compensate for the non-linearity of human hearing.

Acoustic environment Sound at the receiver from all sources of sound as modified by the environment, as defined in ISO 12913-1:2014.

CNOSSOS-EU: 2020 The common noise assessment method according to the END.

CRTN 1988 The noise calculation method Calculation of Road Traffic Noise 1988.

CQA Candidate Quiet Area.

dB (decibel) The unit of sound pressure level, calculated as a logarithm of the intensity of sound. 0 dB is the threshold of hearing, 120 dB is the threshold of pain. Under normal circumstances, a change in sound level of 3 dB is just perceptible. A change of 1 or 2 dB is detectable only under laboratory conditions. A change of 10 dB corresponds approximately to halving or doubling the loudness of sound.

Design Goal A target limit for noise or vibration adopted during the early design stages of a project, not necessarily having a statutory basis but based on current best practice and the particular circumstances of a given scheme.

Do Minimum Describes a scenario under which a road scheme that is under consideration does not proceed (sometimes referred to as "Do Nothing").

Do Something Describes a scenario under which a road scheme that is under consideration proceeds.

EEA European Environment Agency.

END Environmental Noise Directive.

EPA Environmental Protection Agency.

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Free Field Free field noise levels are measured or predicted such that there is no contribution made up of reflections from nearby building façades.

$L_{eq,T}$ The equivalent continuous sound level - the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period T.

L_{den} The day-evening-night composite noise indicator adopted by the EU for the purposes of assessing overall annoyance. Equation below.

$$L_{den} = 10\lg\frac{1}{24}\left(12*10^{\frac{L_{day}}{10}} + 4*10^{\frac{L_{evening}+5}{10}} + 8*10^{\frac{L_{night}+10}{10}}\right)$$

L_{day} The A-weighted long term average sound level as defined in ISO1996-2: 2007, determined over all the day periods over a long-term period (e.g. a year).

$L_{evening}$	The A-weighted long term average sound level as defined in ISO1996-2: 2007, determined over all the evening periods over a long-term period (e.g. a year).
L_{night}	The A-weighted long term average sound level as defined in ISO1996-2: 2007, determined over all the night periods over a long-term period (e.g. a year).
LDP	Limerick Development Plan.
LSMATS	Limerick Shannon Metropolitan Area Strategy.
NAP	Noise Action Plan.
NPO	National Policy Objective in the National Development Plan.
NRA	National Roads Authority.
NTA	National Transport Authority.
PCQA	Potential Candidate Quiet Area.
Soundscape	The acoustic environment as perceived or experienced and/or understood by a person or people, in context, as defined in ISO 12913-1:2014.
Soundwalk	A walk with a focus on the listening environment.
TII	Transport Infrastructure Ireland.
WebTAG	Transport analysis guidance tool for the proposal of policies and interventions to ensure a consistent approach in transport appraisal.

Appendix B: County Limerick areas – Round 4 Noise Action Plan

The Electoral Areas of **Adare-Rathkeale**, **Cappamore-Kilmallock** and **Newcastle West**.

In the Electoral Area of **Limerick City East**:

- the Electoral Division of **Castleconnell**;
- in the Electoral Division of **Ballyvarra** –

Ardvarna	**Ballyguy**	**Ballynagowan**	**Ballyvarra**
Ballyvarra Wood	**Ballyvollane**	**Biddyford**	**Boher**
Carrowkeel	**Cloghnadromin**	**Clonkeen (Molyneux)**	**Clooncunna South**
Clooncunna North	**Clyduff East**	**Clyduff West**	**Curragh**
Foyle	**Garrymore**	**Grange Lower**	**Grange Upper**
Keyanna	**Kileenagarriff**	**Killonan**	**Kishyquirk**
Knockbrack East	**Knockbrack West**	**Knocksentry**	**Laghtane East**
Lismullane	**Lisnagry**	**Mounshannon**	**Prospect**
Raheen	**Richill**	**Newgarden North**	**Scart**
Thornfield			

- in the Electoral Division of **Ballysimon** –

Ballyneety	**Ballyogartha**	**Cahernarry (Cripps)**	**Cahernarry (Keane)**
Carrigmartin	**Carrigparson**	**Coolishal**	**Coolreagh**
Cunnihee	**Edwardstown**	**Knockbrien**	**Knockea**
Scart	**Toreen**	**Whitehall**	

- in the Electoral Division of **Roxborough** -

Ashfort	**Cahervally**	**Friarstown**	**Greenhills**
Lemonfield	**Lickadoon**	**Lissanalta**	**Oatlands**
Parkroe	**Toberyquin**	**Raheen**	

In the Electoral Area of **Limerick City West**:

- the Electoral Division of **Clarina**;
- the Electoral Division of **Patrickswel**l.

Appendix C: Strategic Noise Maps

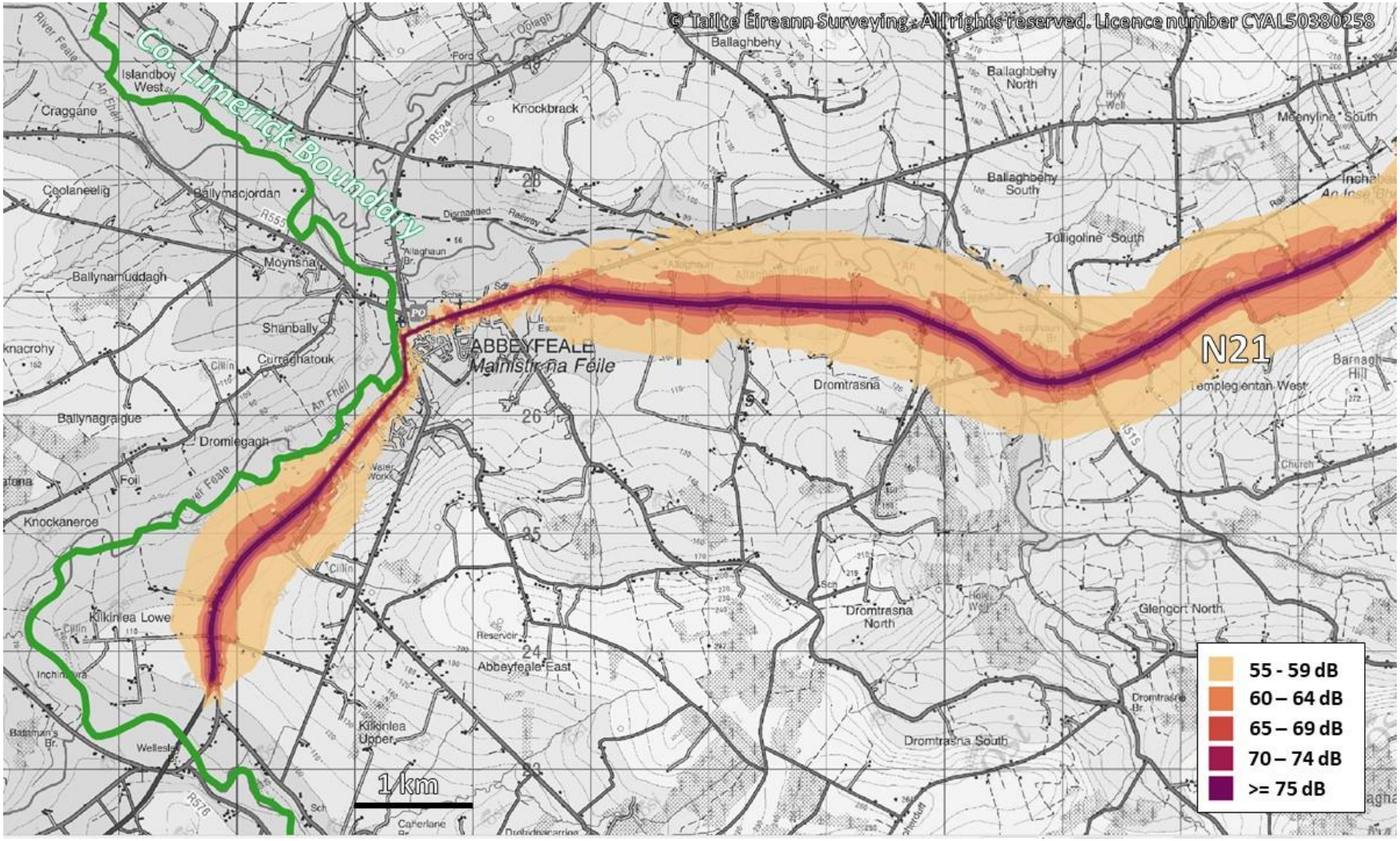

Figure C.1. L_{den} (dB) – N21, Abbeyfeale Area.

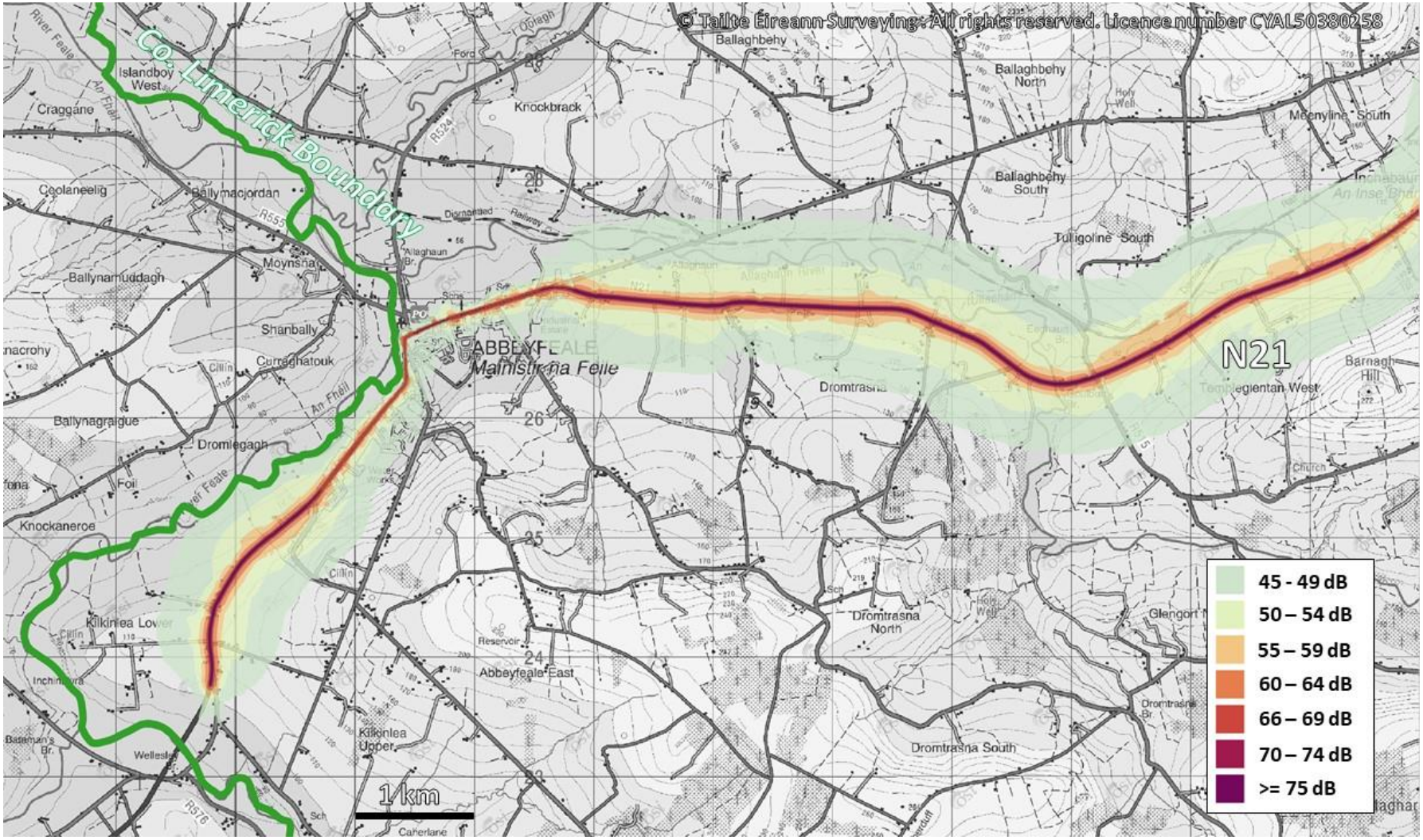

Figure C.2. L_{night} (dB) – N21, Abbeyfeale Area.

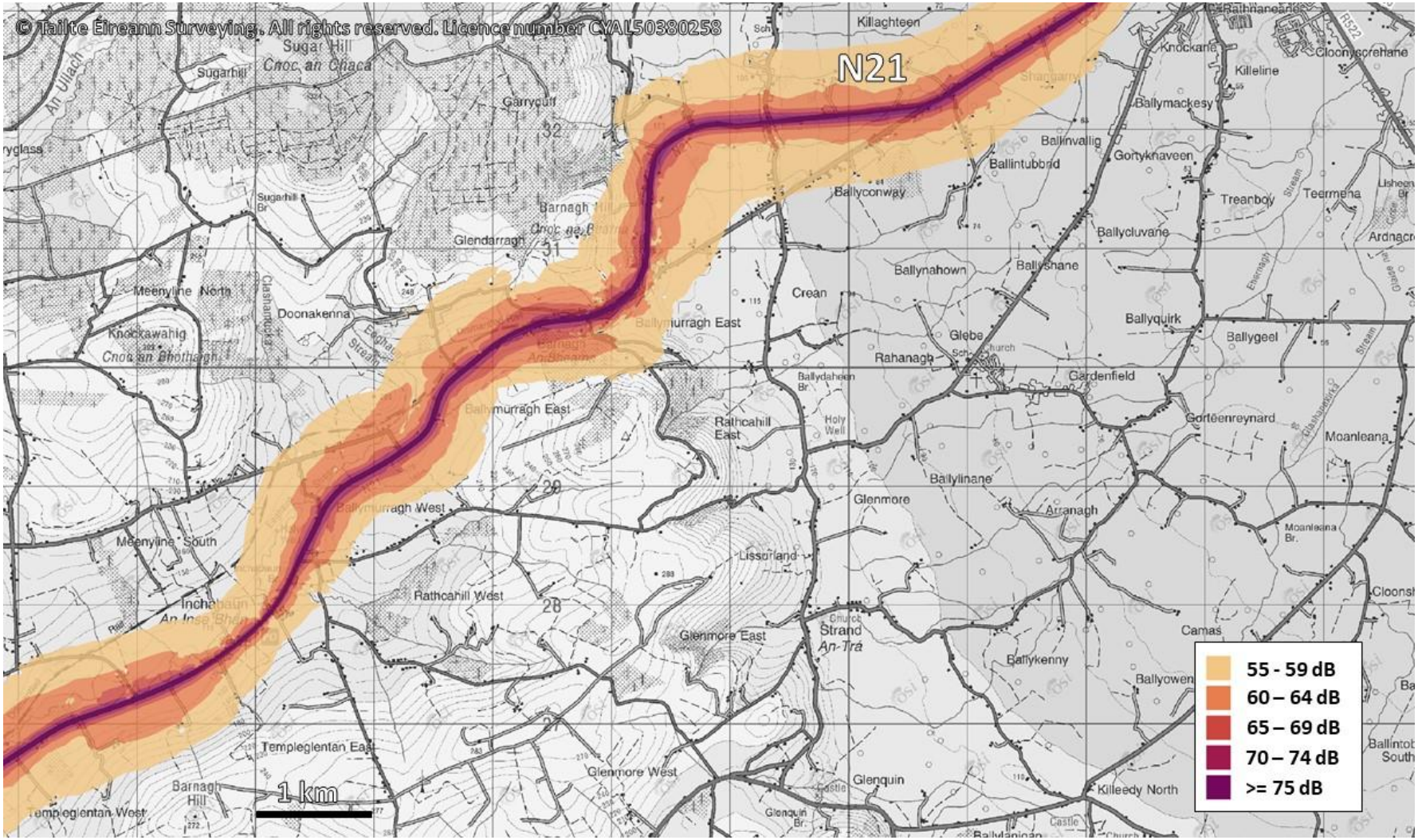

Figure C.3. L_{den} (dB) – N21, Templeglantine Area.

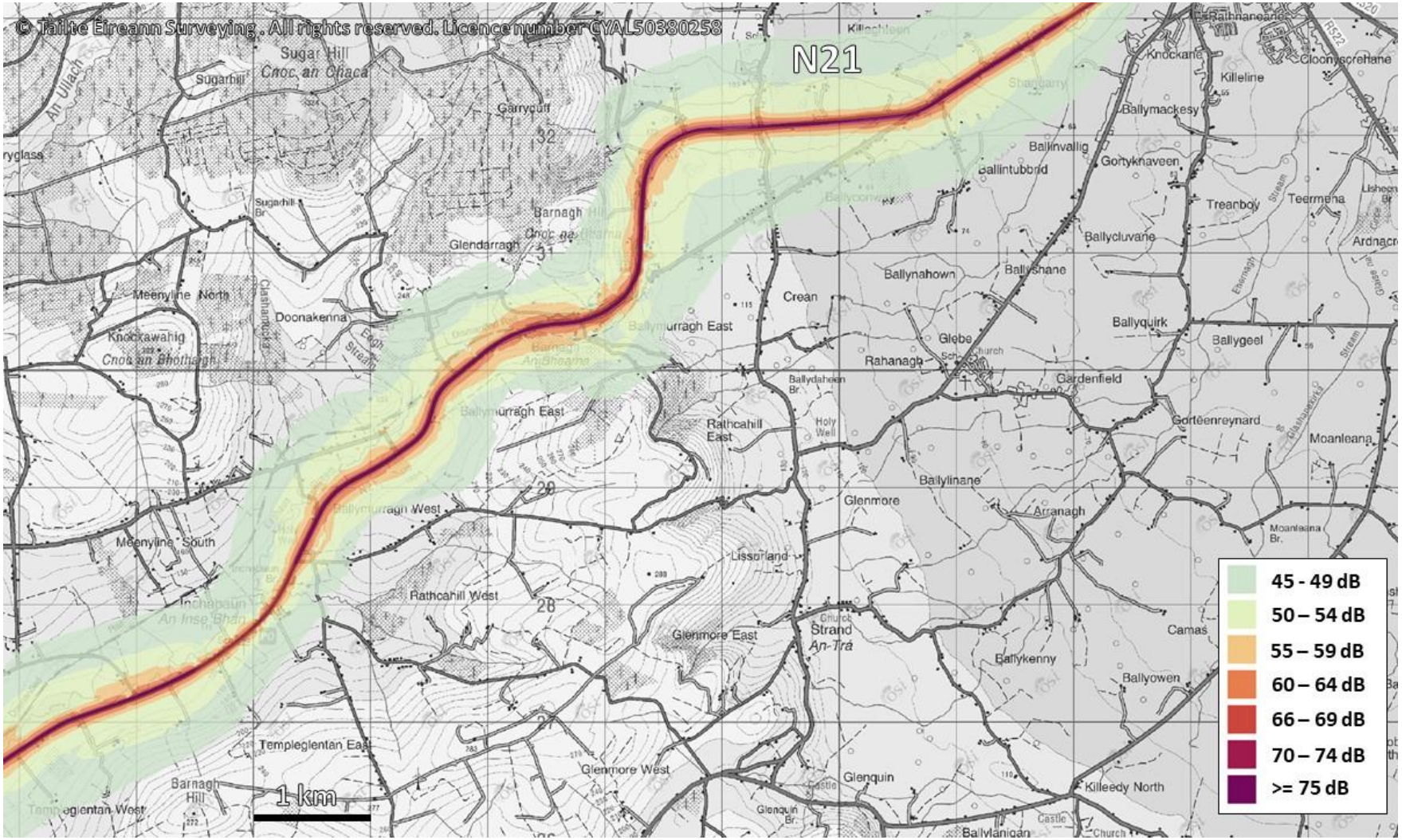

Figure C.4. L_{night} (dB) – N21, Templeglantine Area.

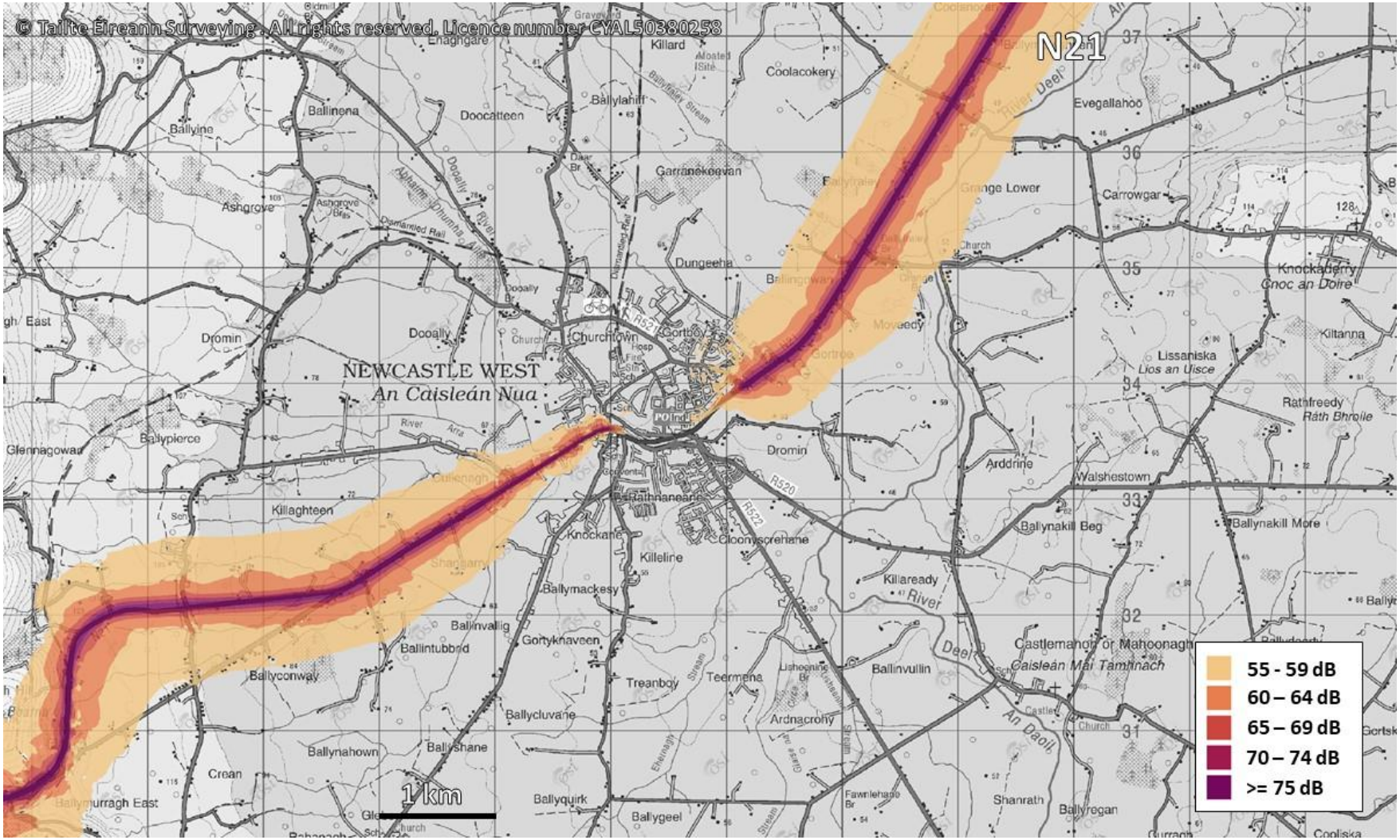

Figure C.5. L_{den} (dB) – N21, Newcastle West Area.

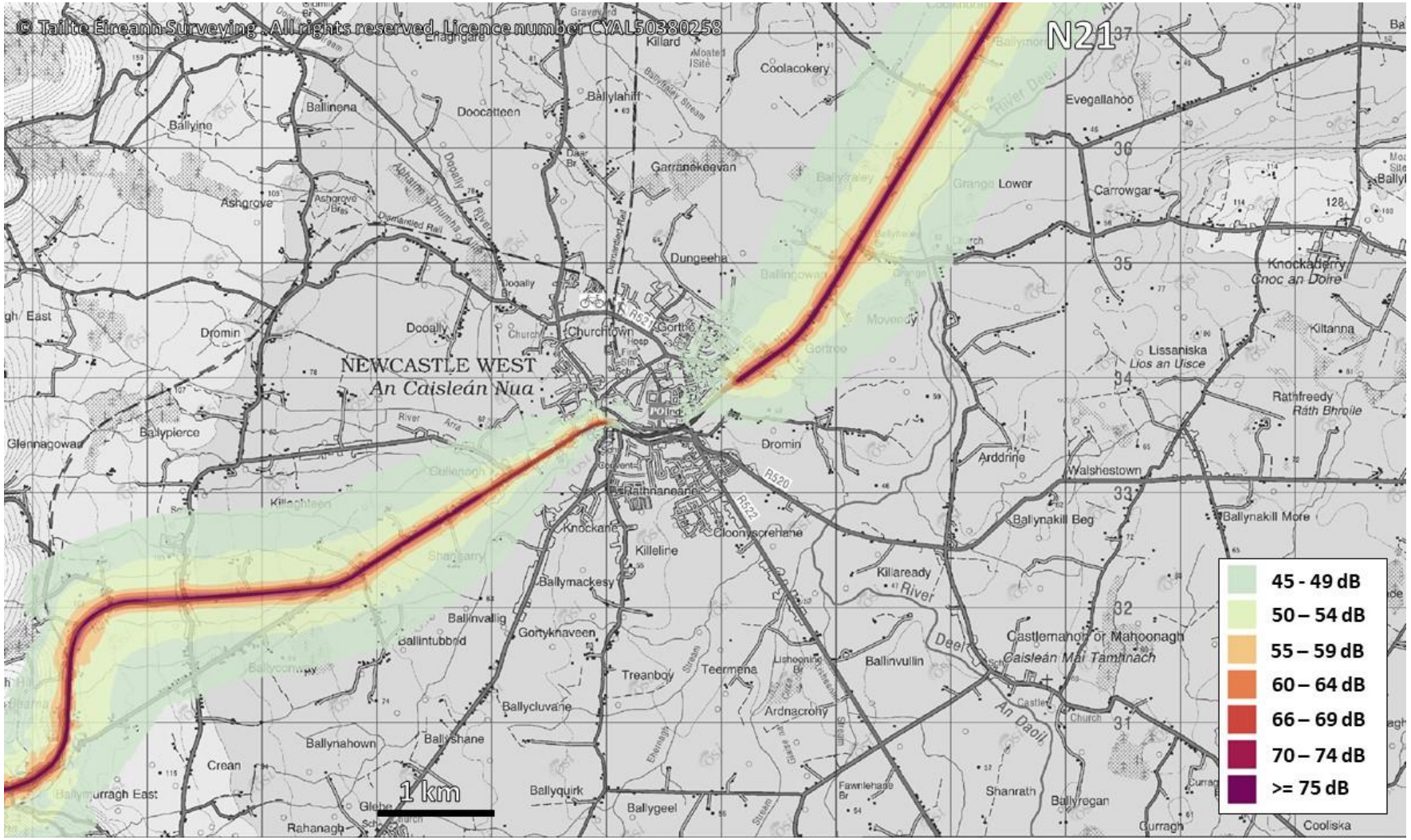

Figure C.6. L_{night} (dB) – N21, Newcastle West Area.

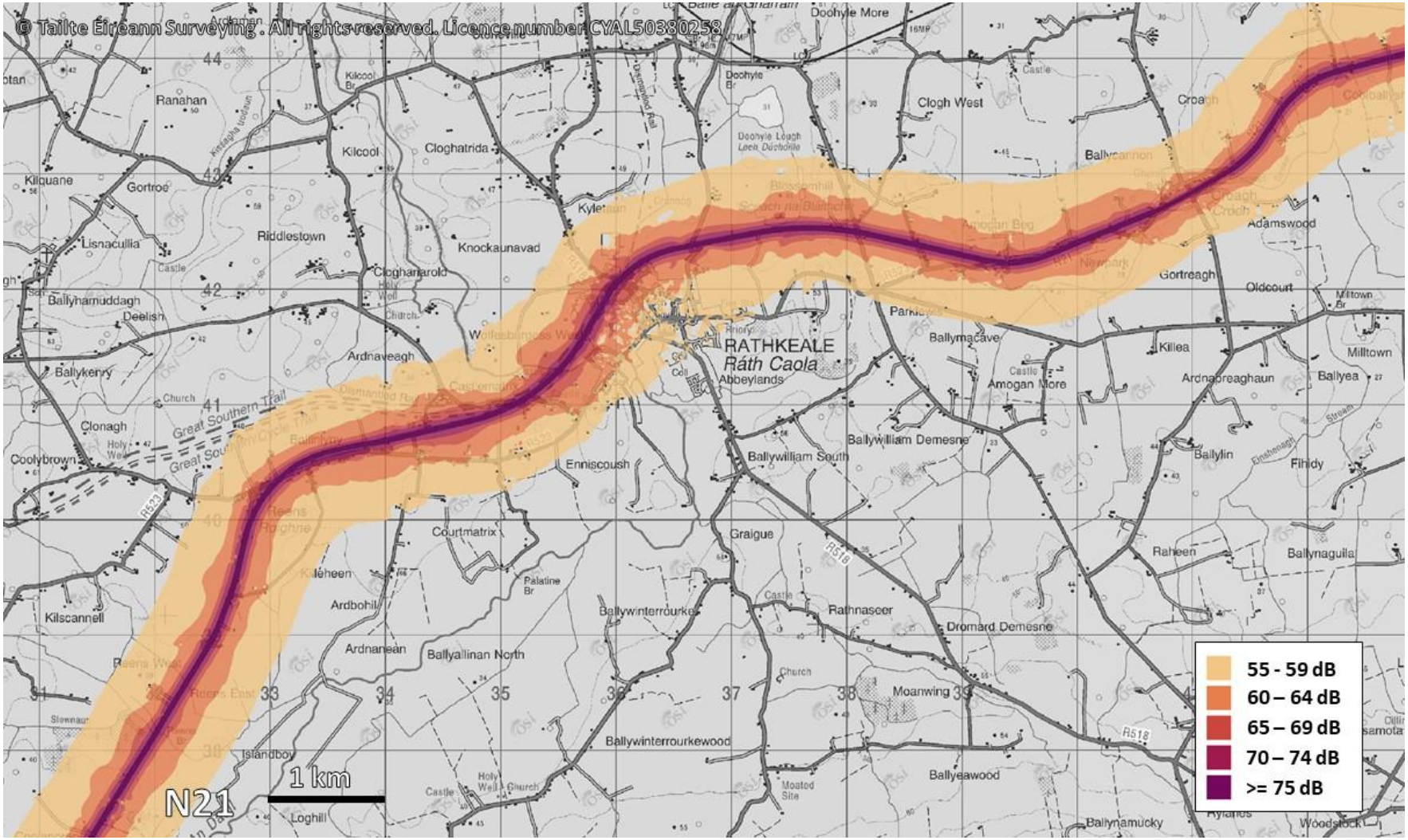

Figure C.7. L_{den} (dB) – N21, Rathkeale Area.

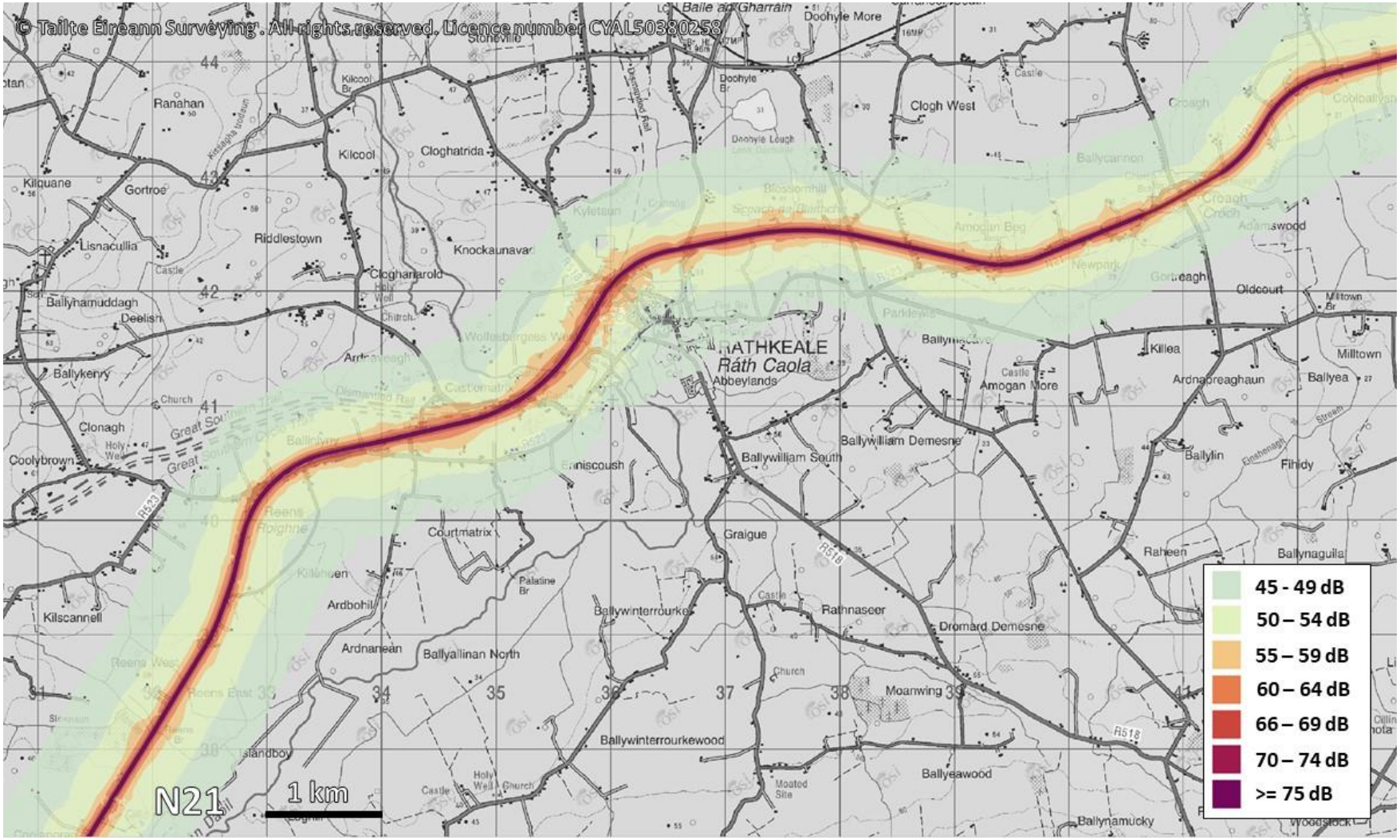

Figure C.8. L_{night} (dB) – N21, Rathkeale Area.

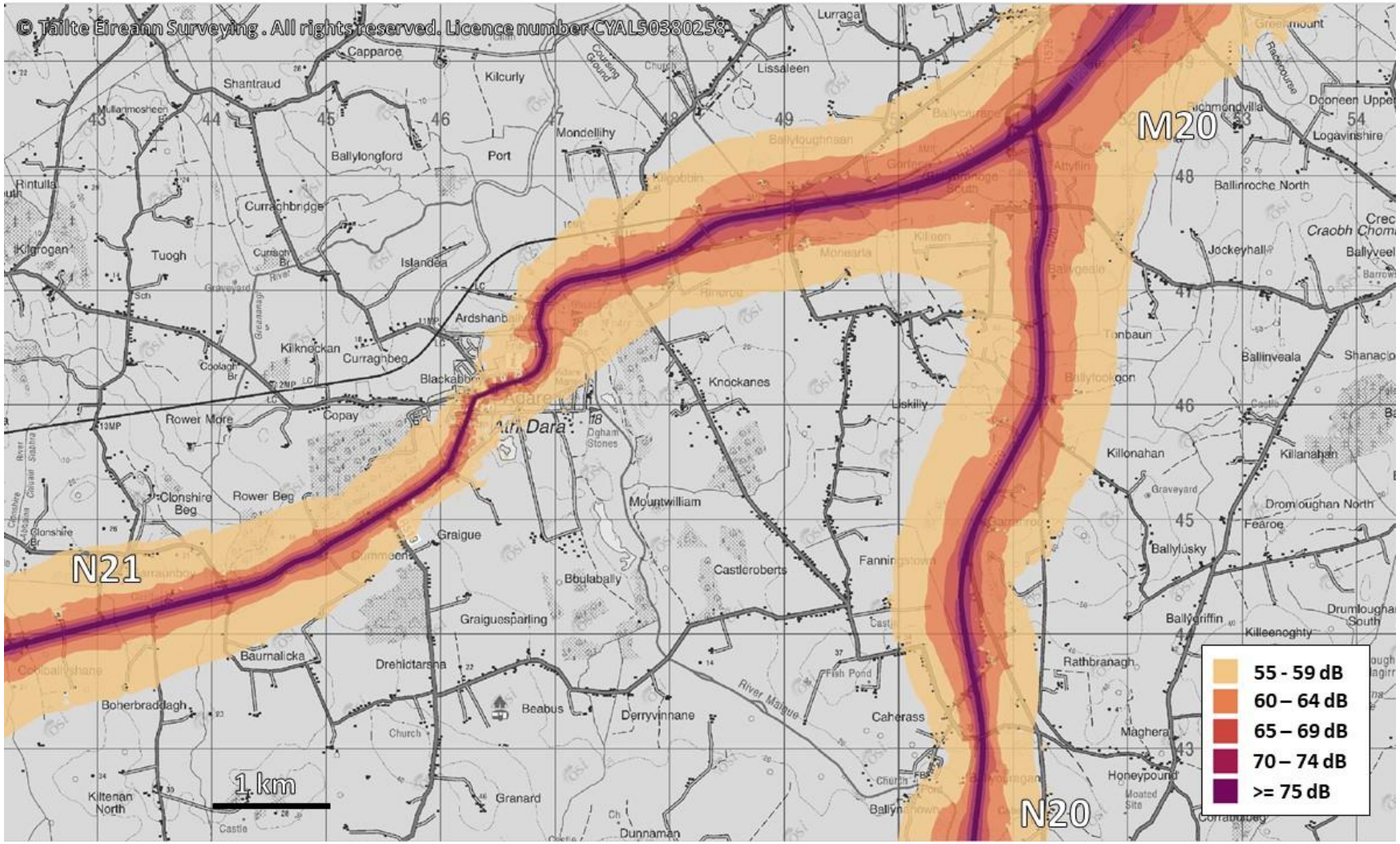

Figure C.9. L_{den} (dB) – N21, Adare Area; M20/N20, Attyflin Area.

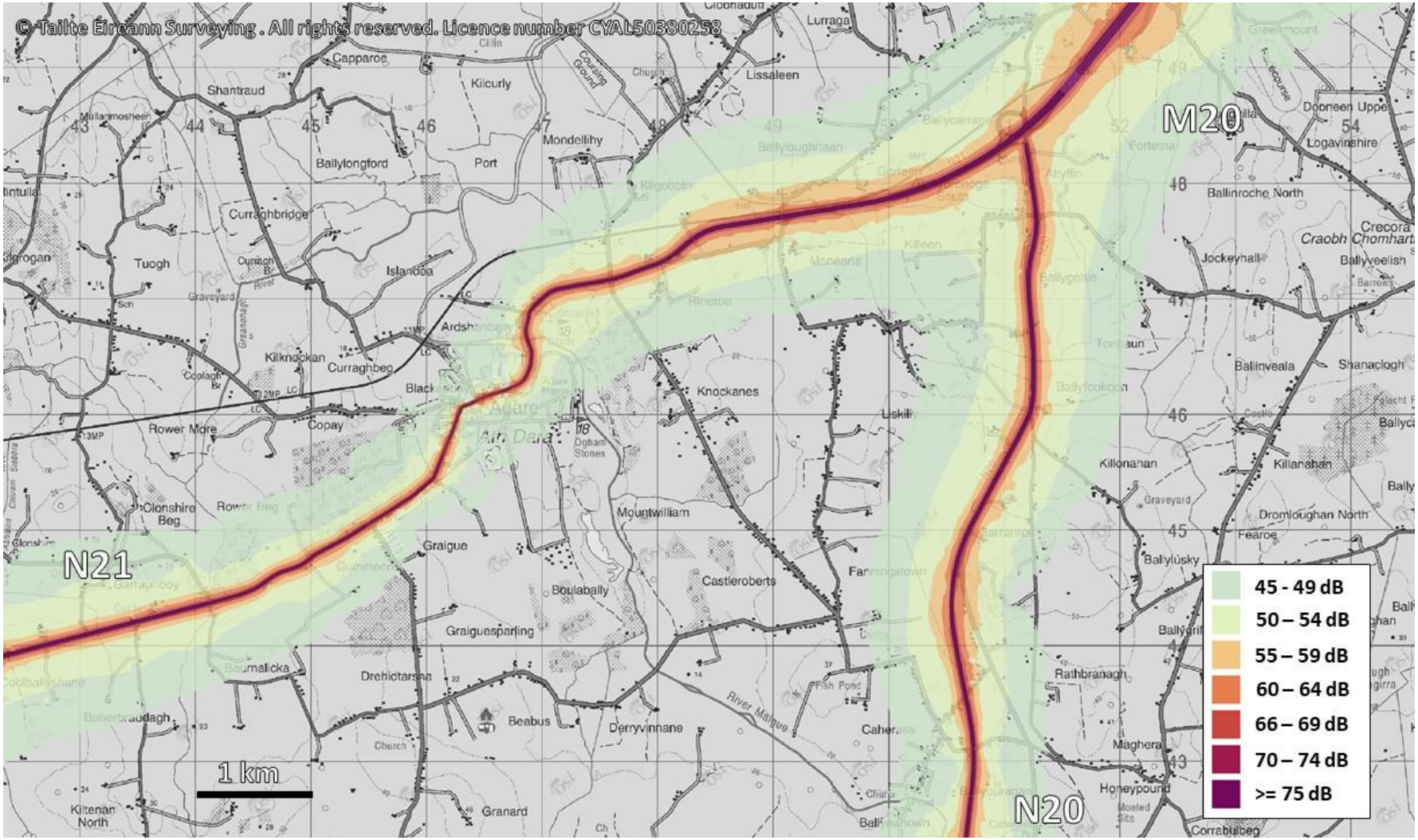

Figure C.10. L_{night} (dB) – N21, Adare Area; M20/N20, Attyflin Area.

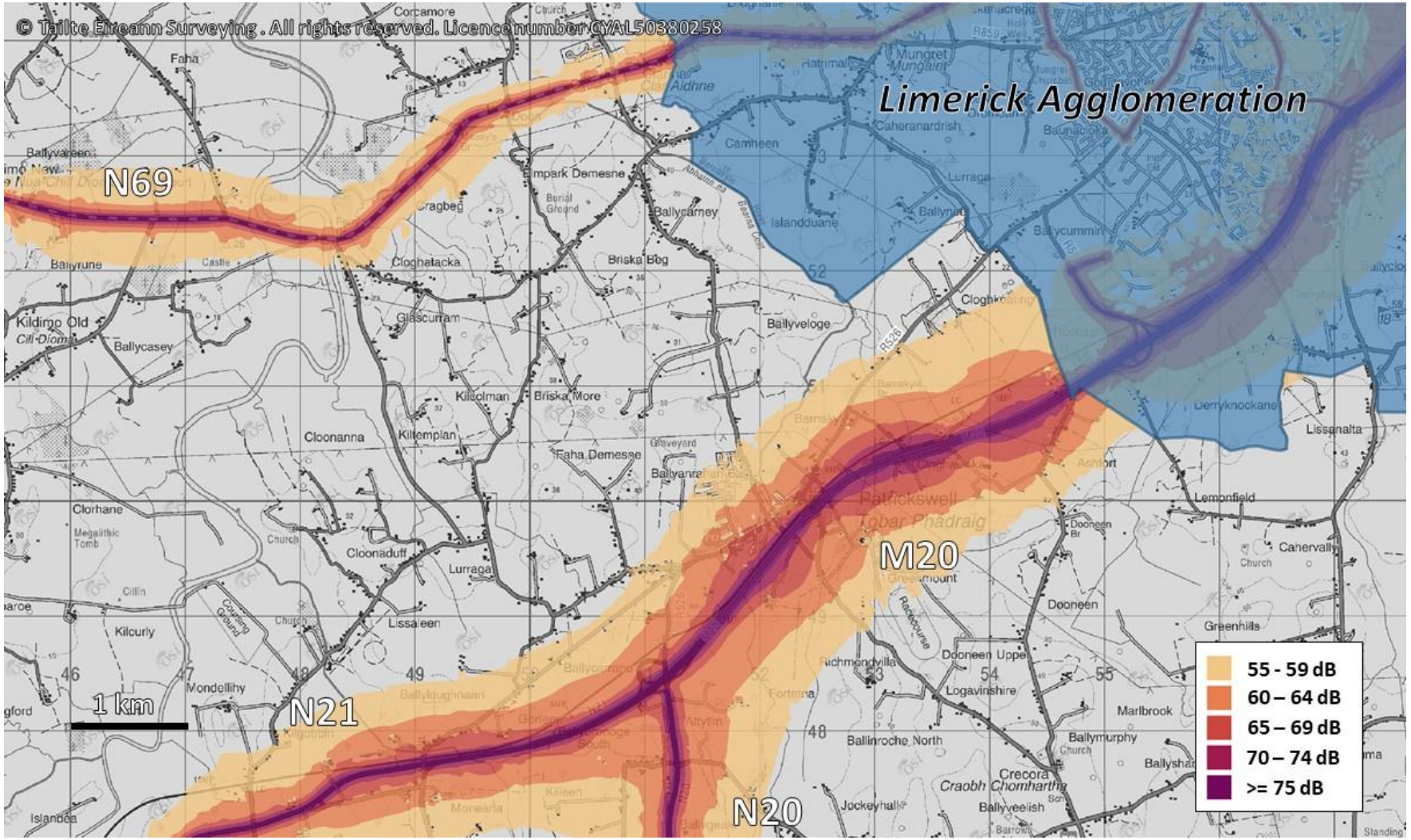

Figure C.11. L_{den} (dB) – M20, Patrickswell Area; N69 Clarina Area.

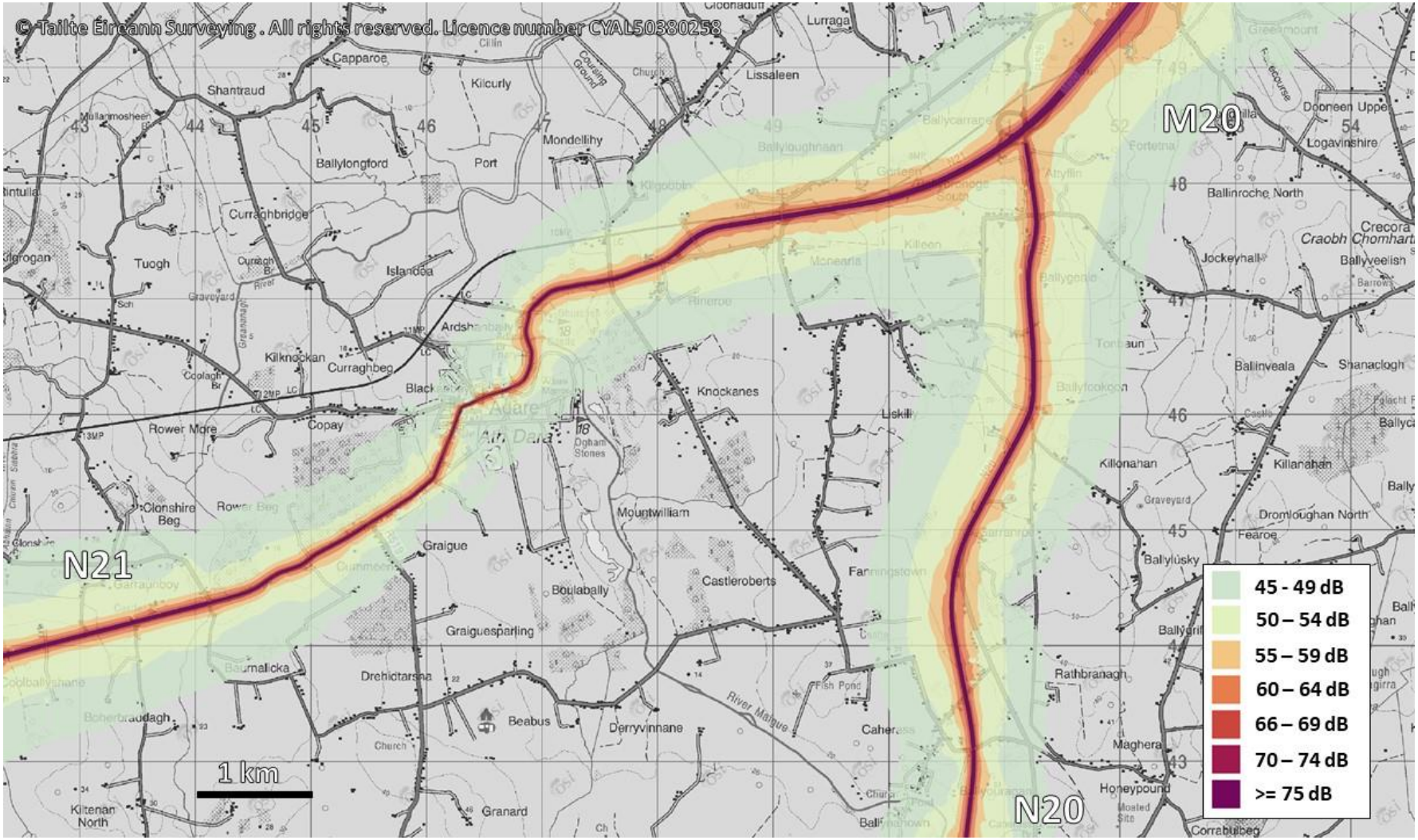

Figure C.12. L_{night} (dB) – M20, Patrickswell Area; N69 Clarina Area.

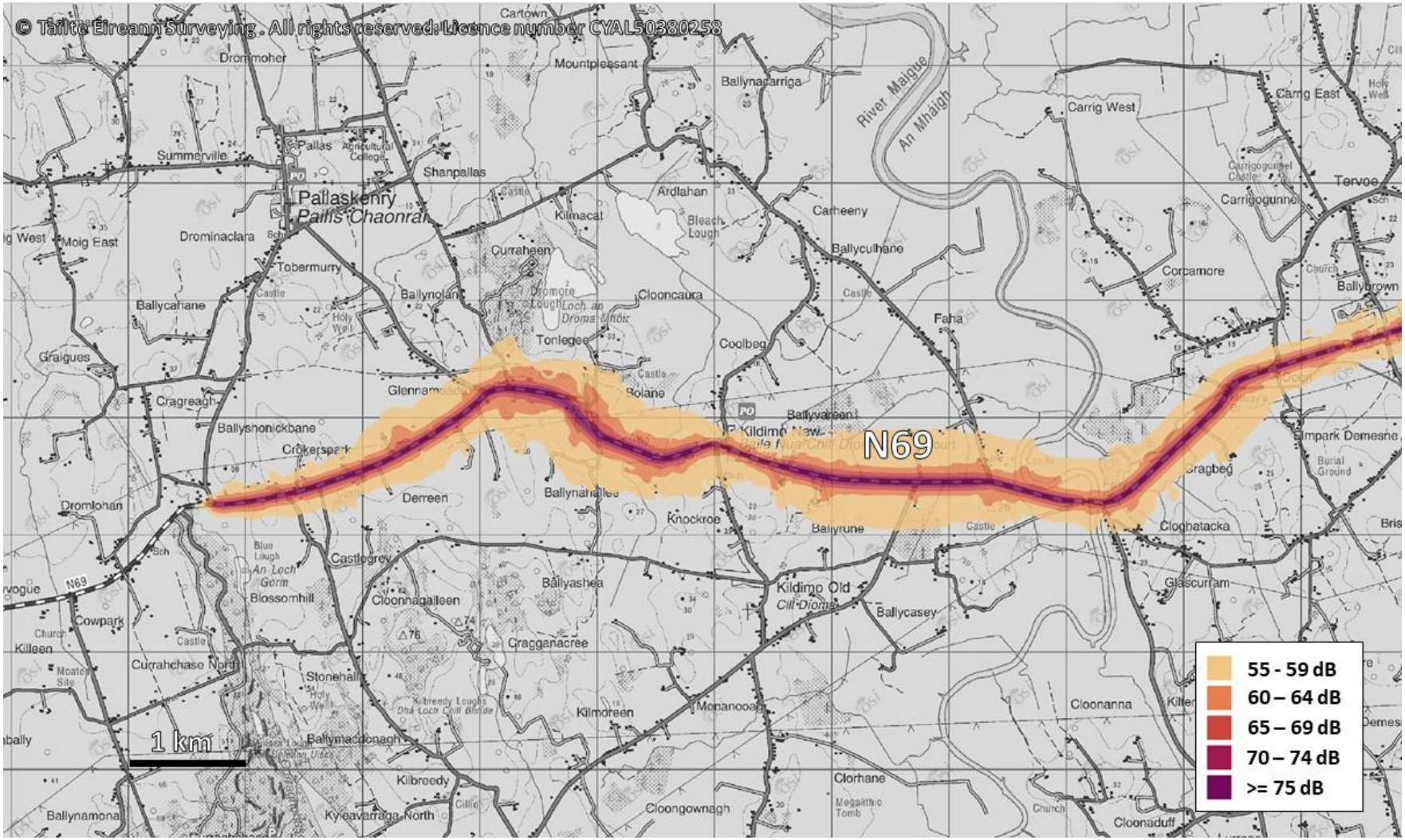

Figure C.13. L_{den} (dB) – N69, Kildimo Area.

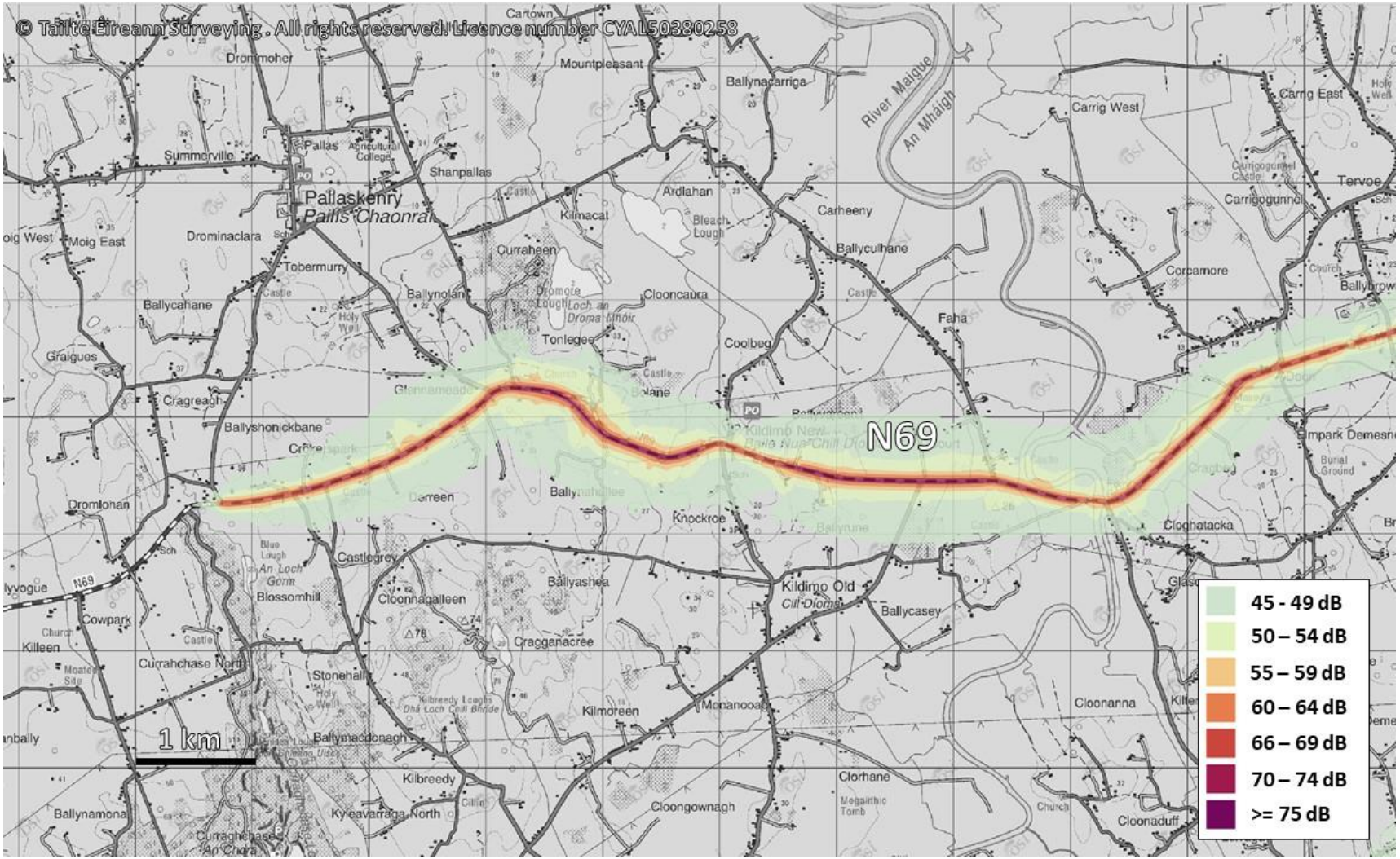

Figure C.14. L_{night} (dB) – N69, Kildimo Area.

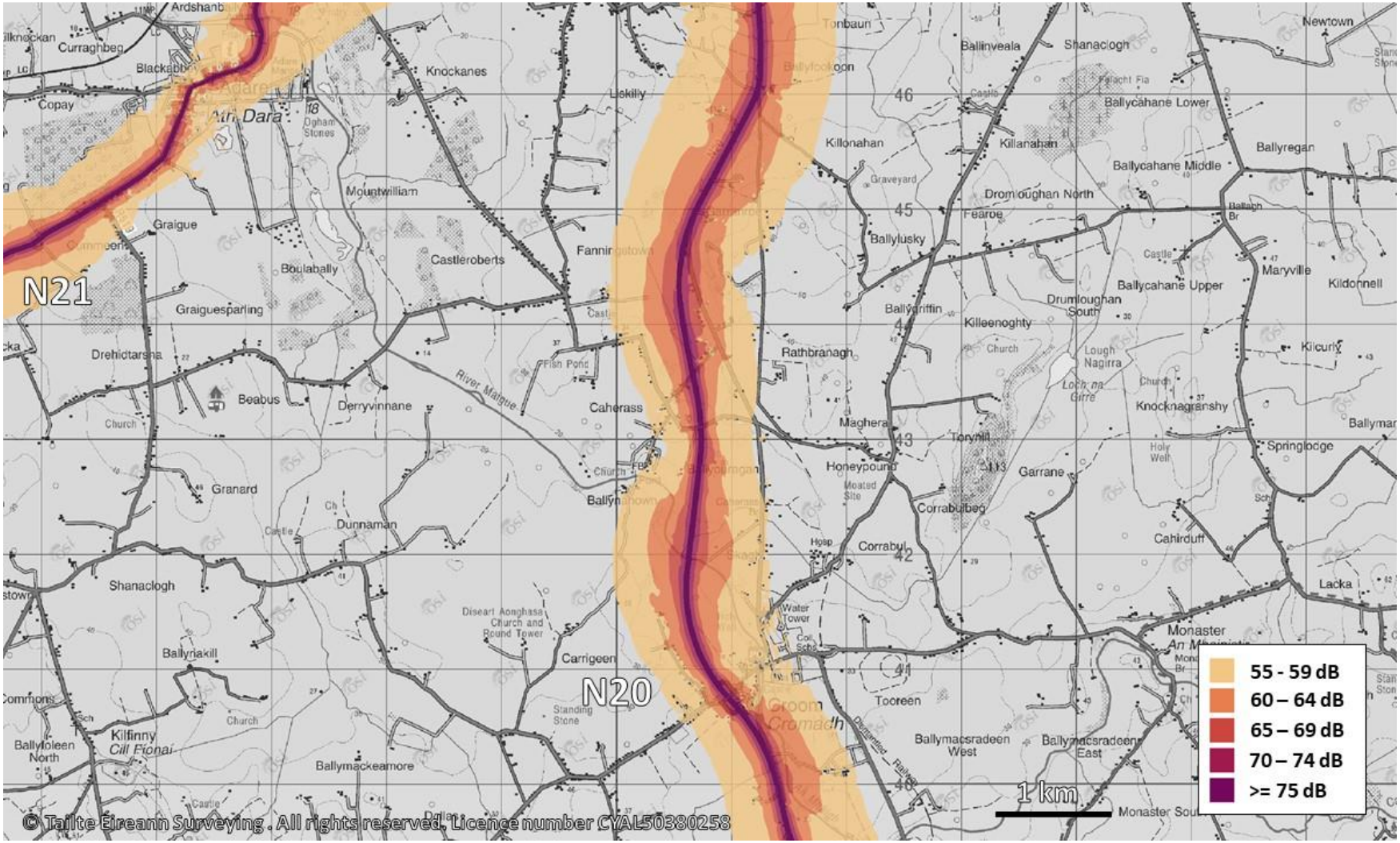

Figure C.15. L_{den} (dB) – N20, Croom Area.

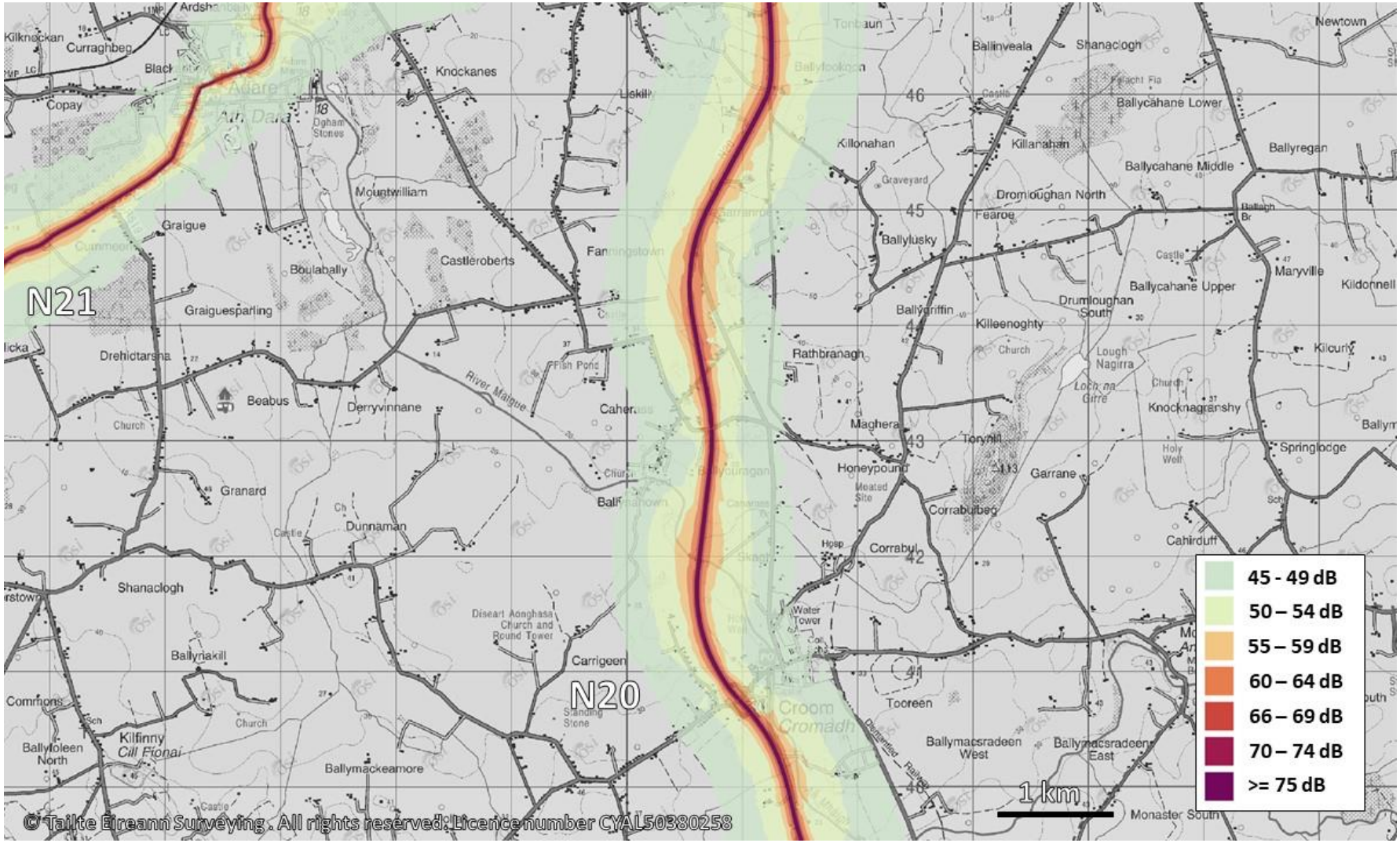

Figure C.16. L_{night} (dB) – N20, Croom Area.

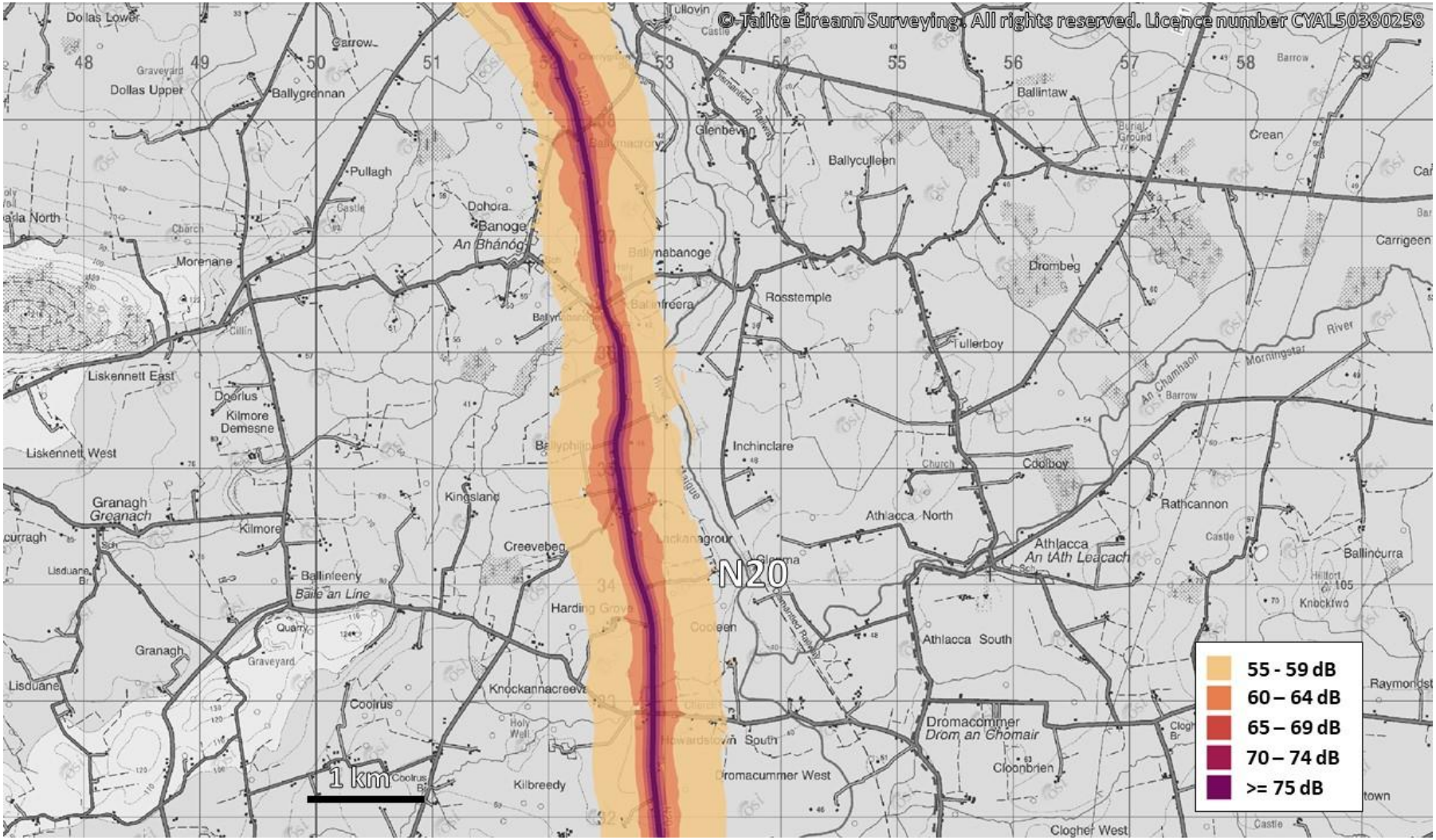

Figure C.17. L_{den} (dB) – N20, Banoge Area.

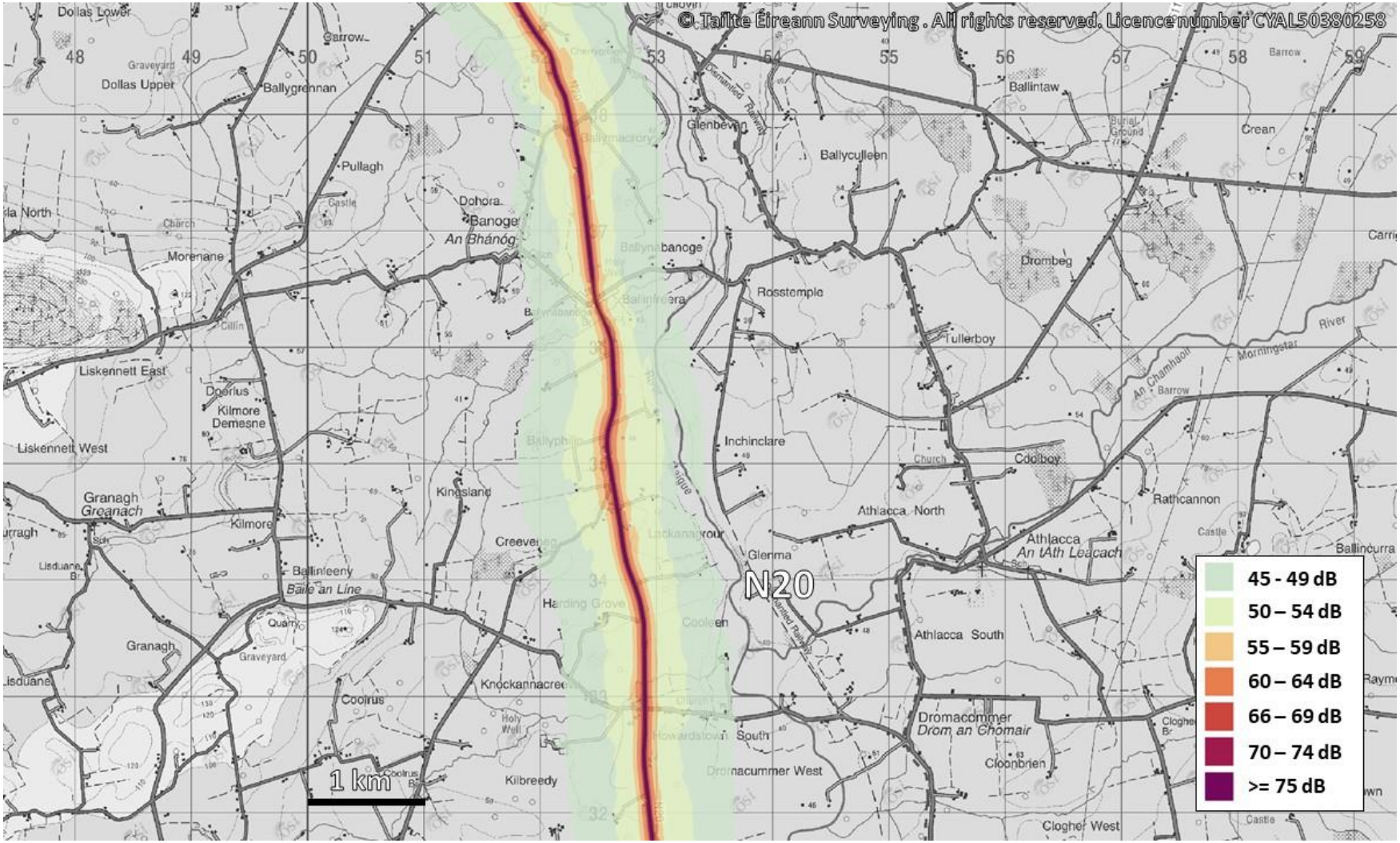

Figure C.18. L_{night} (dB) – N20, Banoge Area.

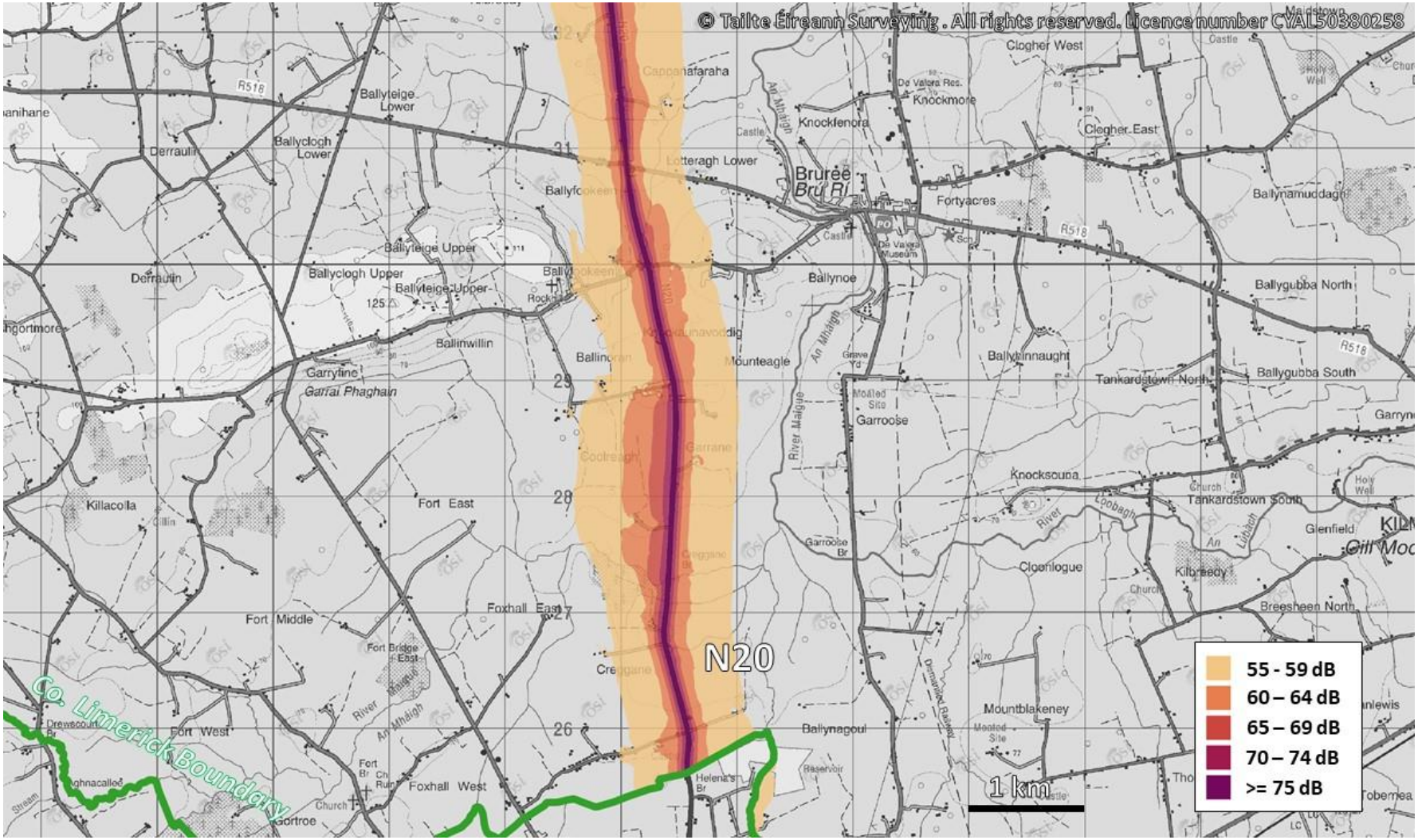

Figure C.19. L_{den} (dB) – N20, Bruree Area.

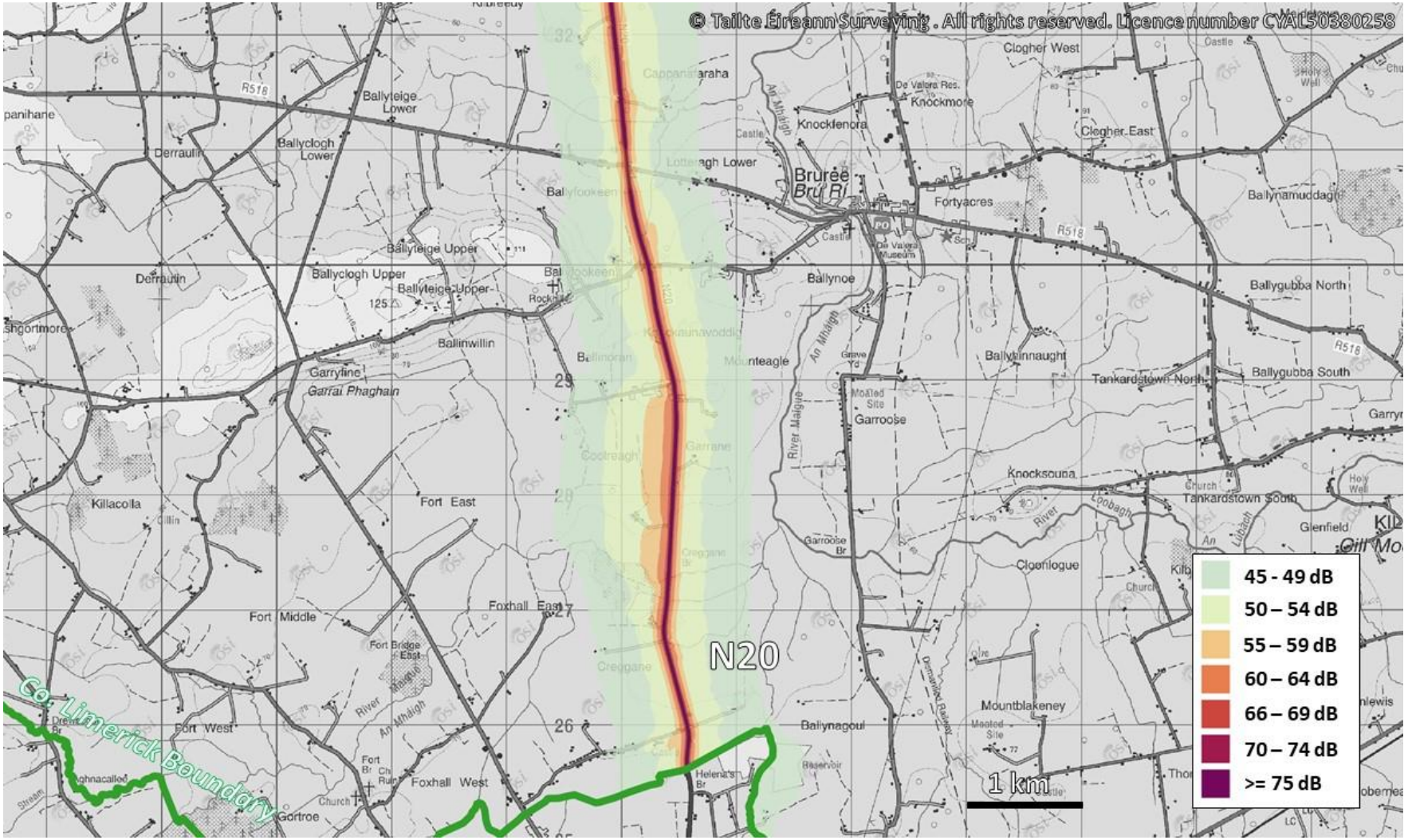

Figure C.20. L_{night} (dB) – N20, Bruree Area.

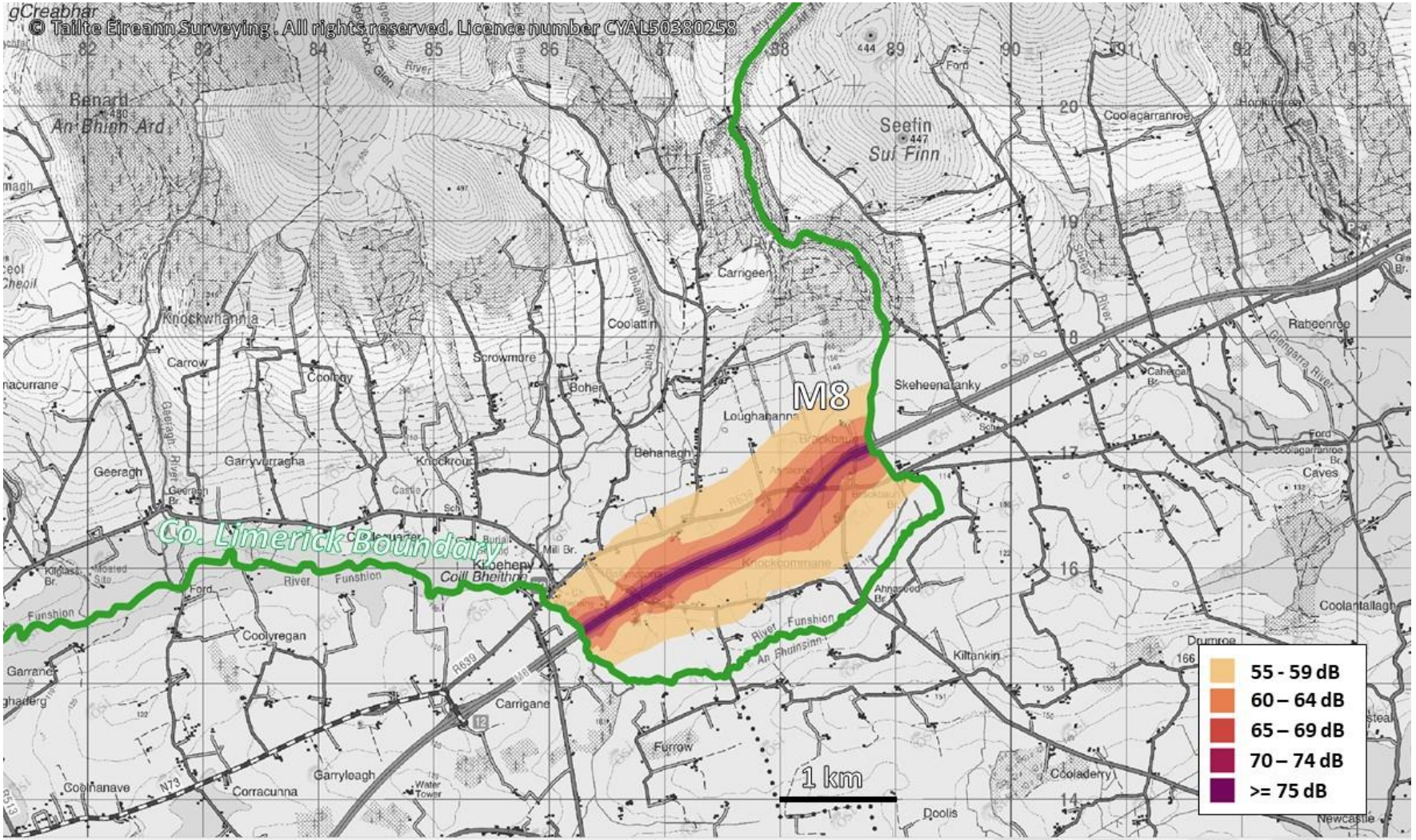

Figure C.21. L_{den} (dB) – M8, Kilbeheny Area.

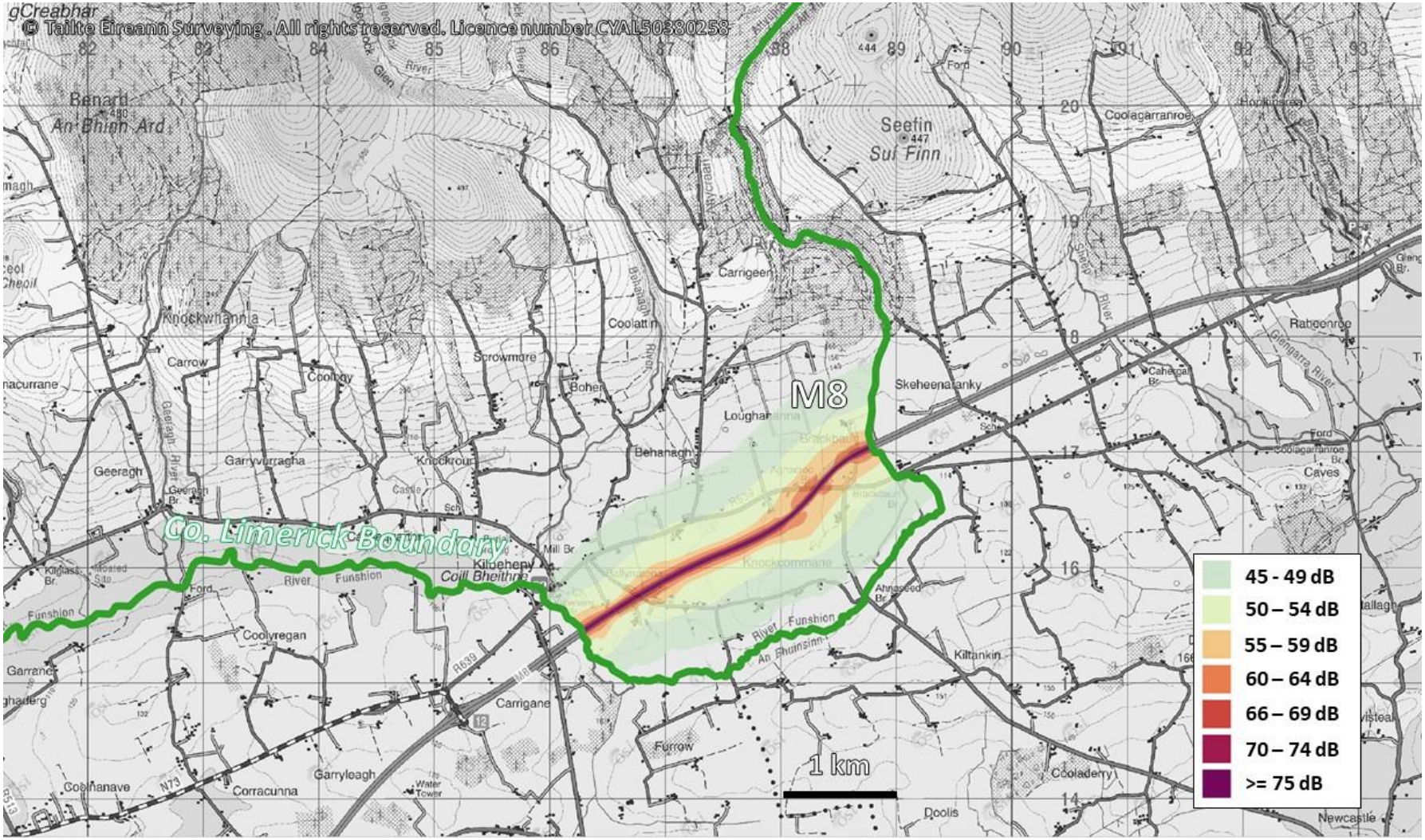

Figure C.22. L_{night} (dB) –M8, Kilbeheny Area.

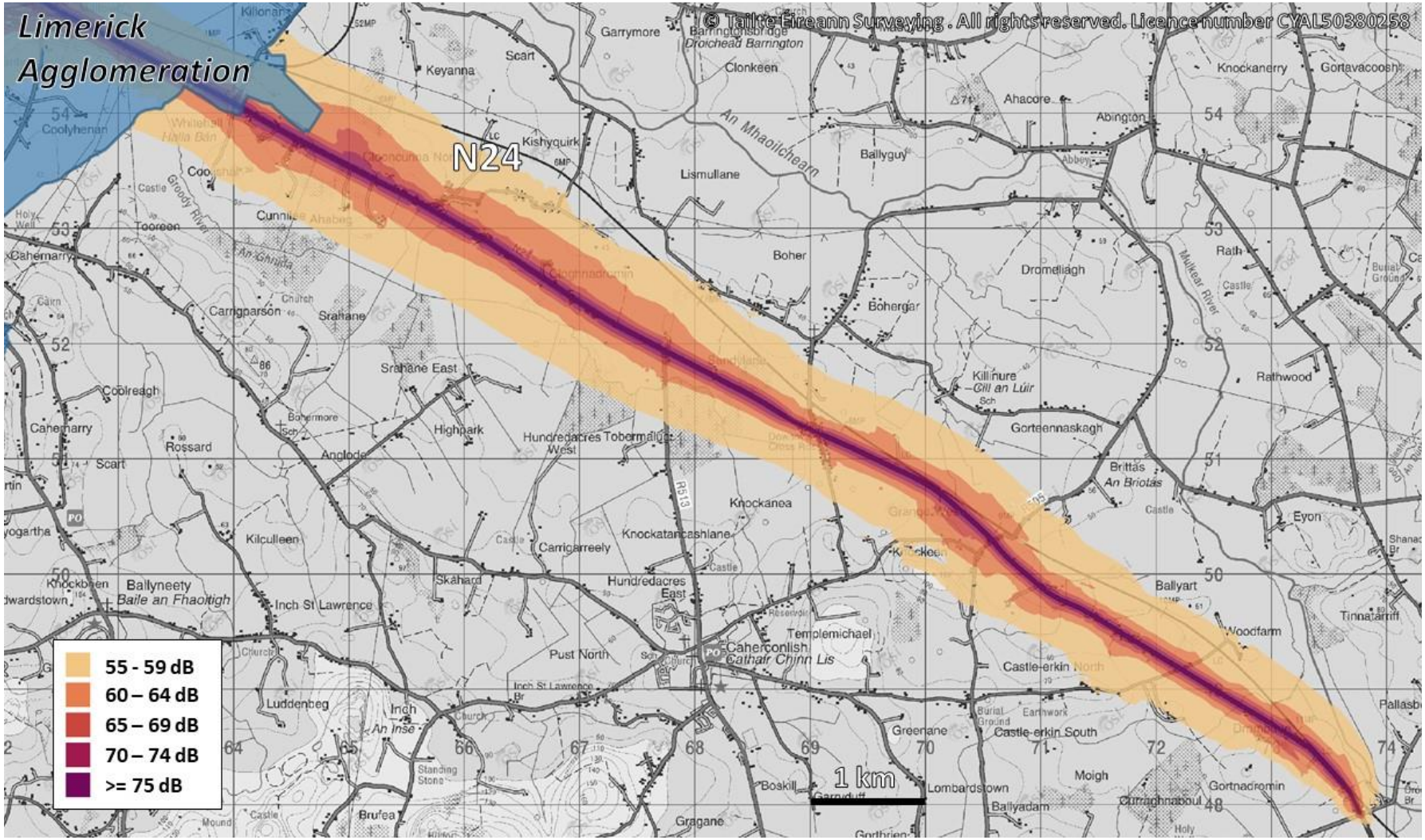

Figure C.23. L_{den} (dB) – N24, Caherconlish Area.

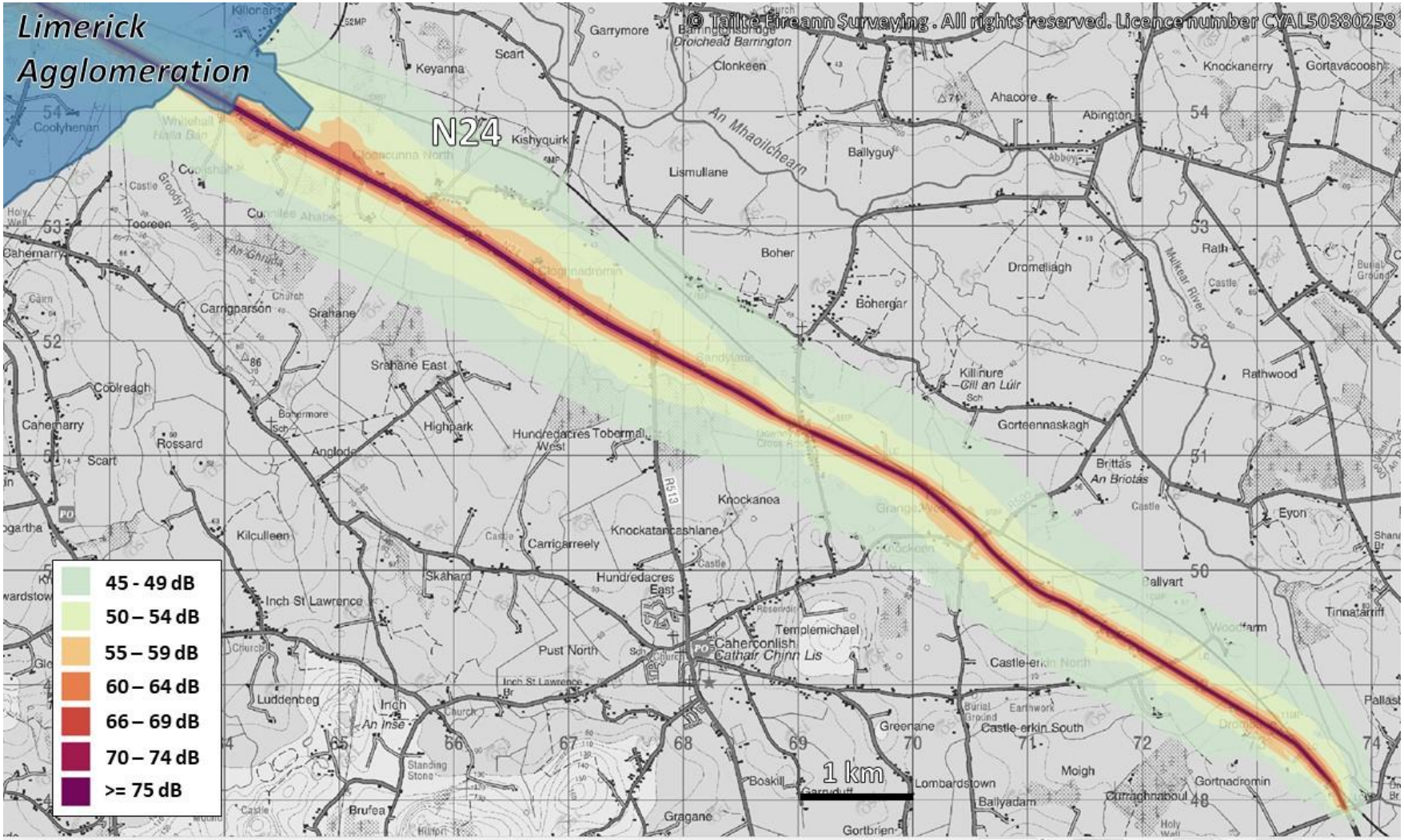

Figure C.24. L_{night} (dB) – N24, Caheconlish Area.

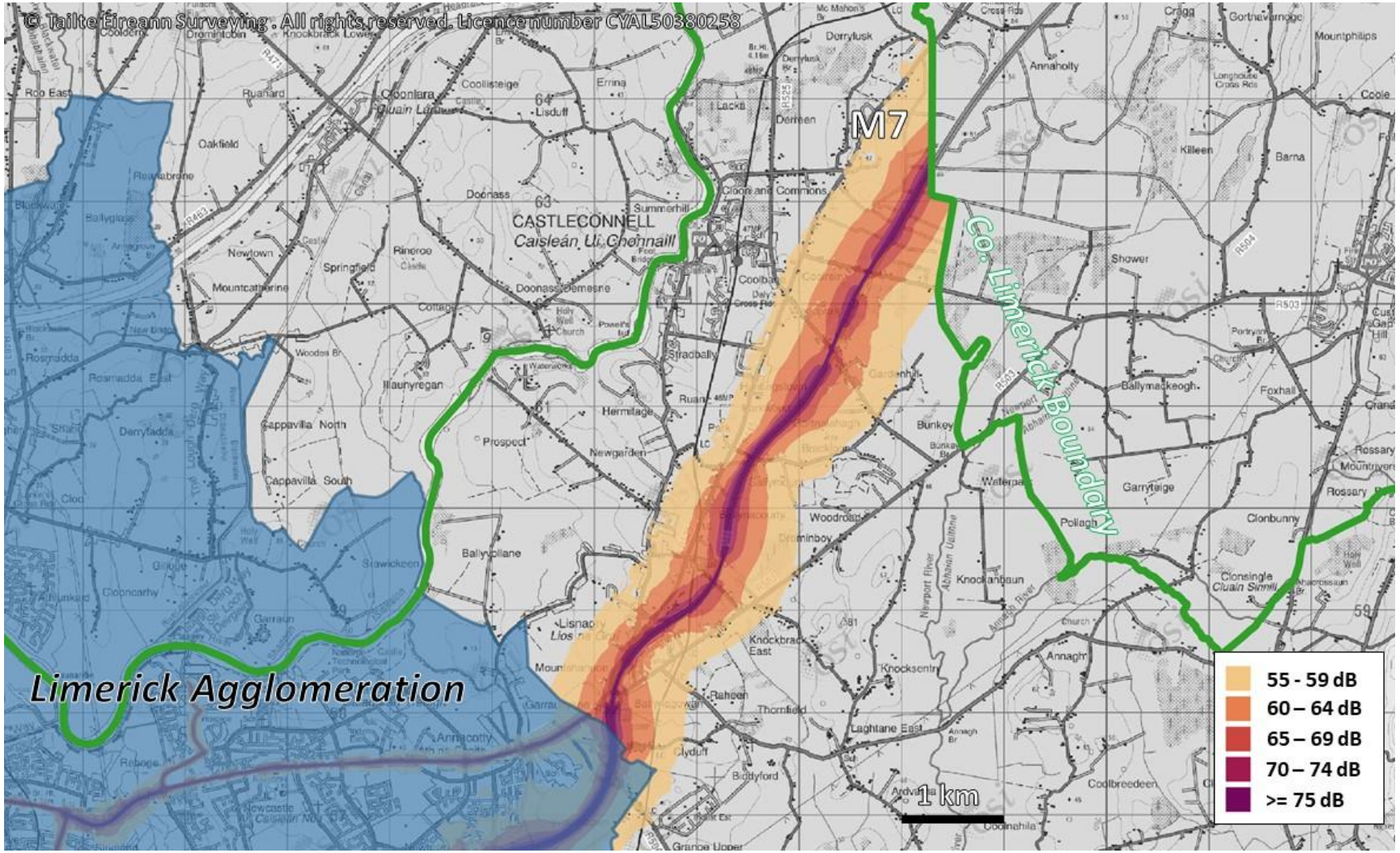

Figure C.25. L_{den} (dB) – M7, Castleconnell Area.

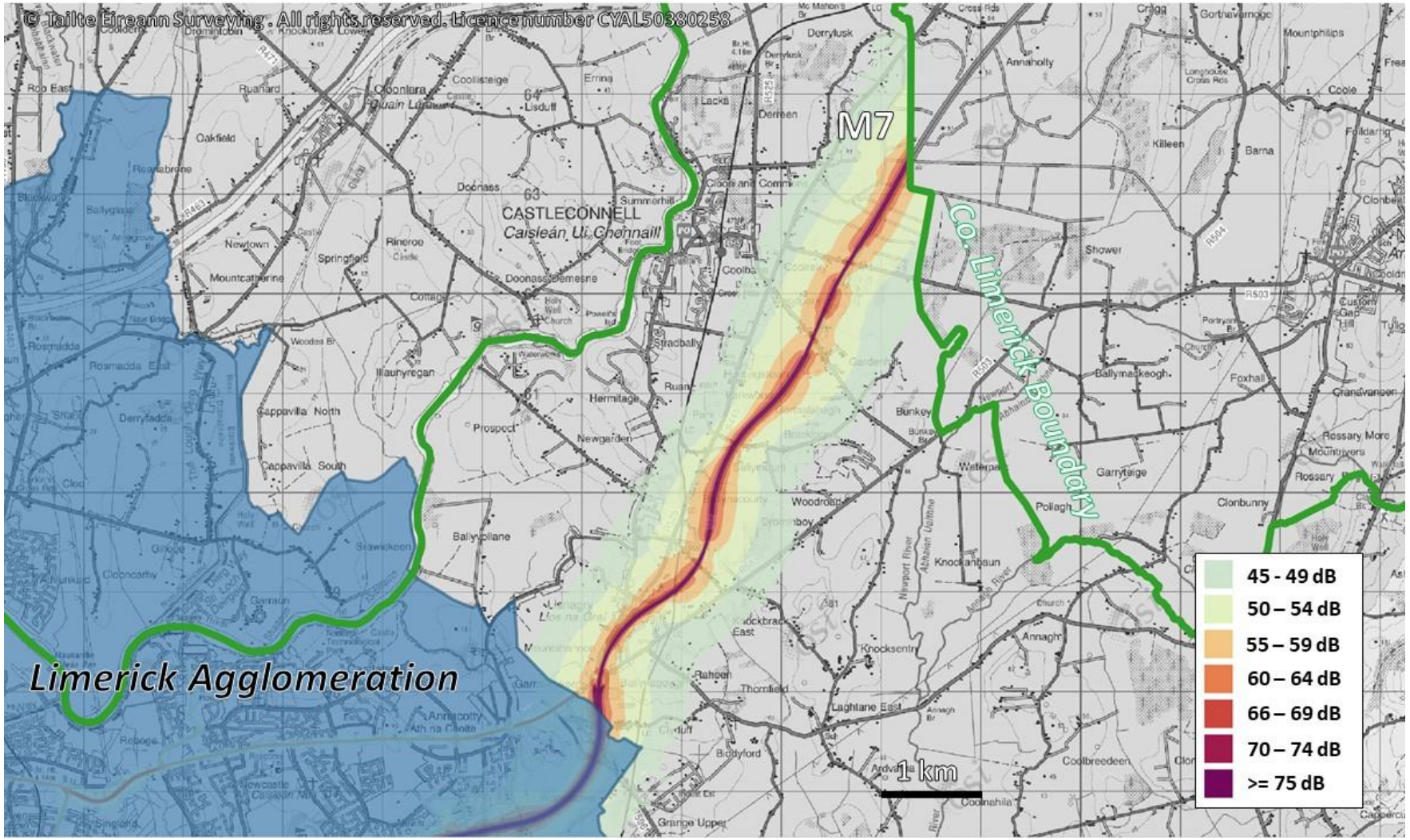

Figure C.26. L_{night} (dB) – N24, Castleconnell Area.

Appendix D: Noise Sensitive Buildings Location Maps

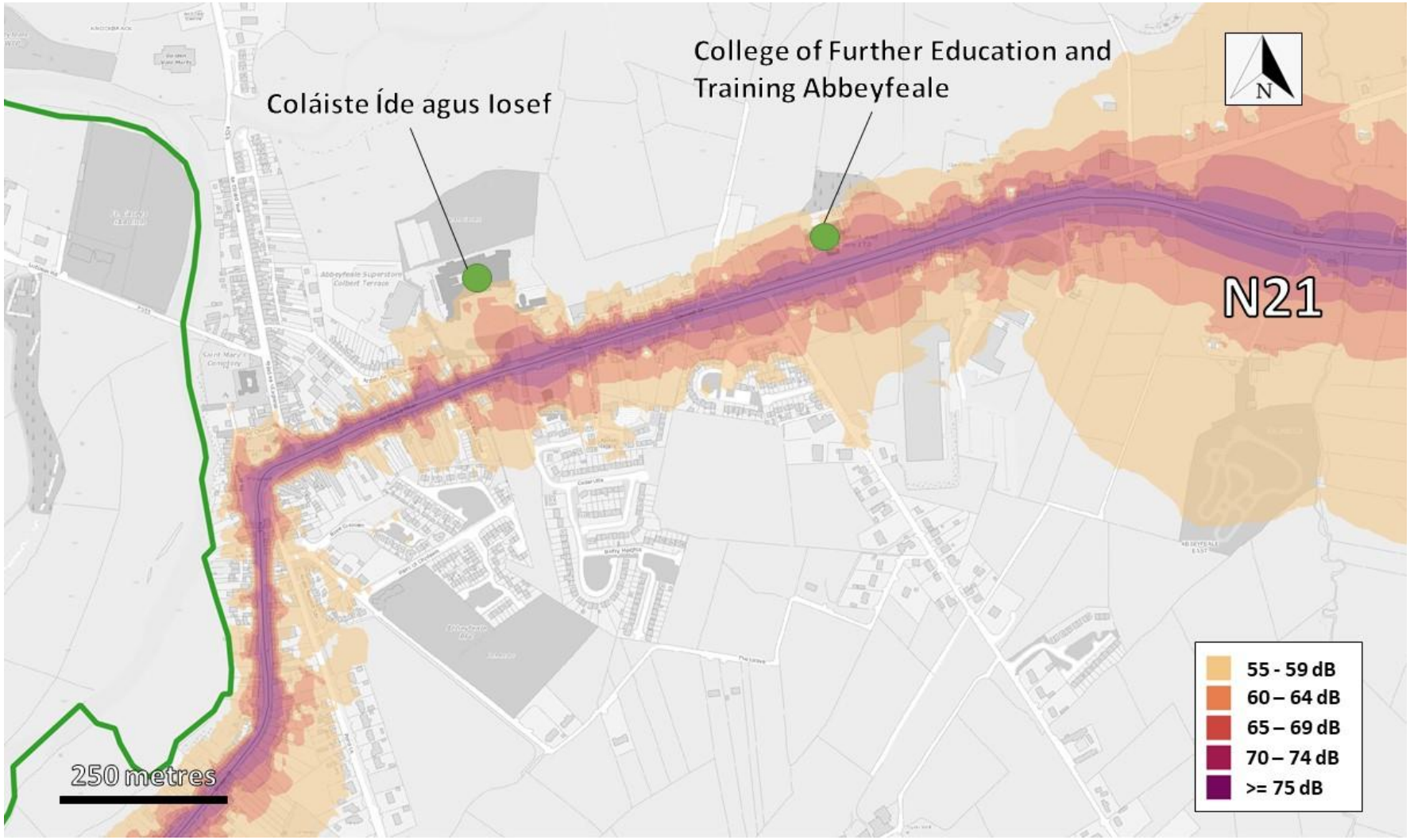

Figure D.1. L_{den} (dB) – N21, Noise Sensitive Buildings in the Abbeyfeale Area.

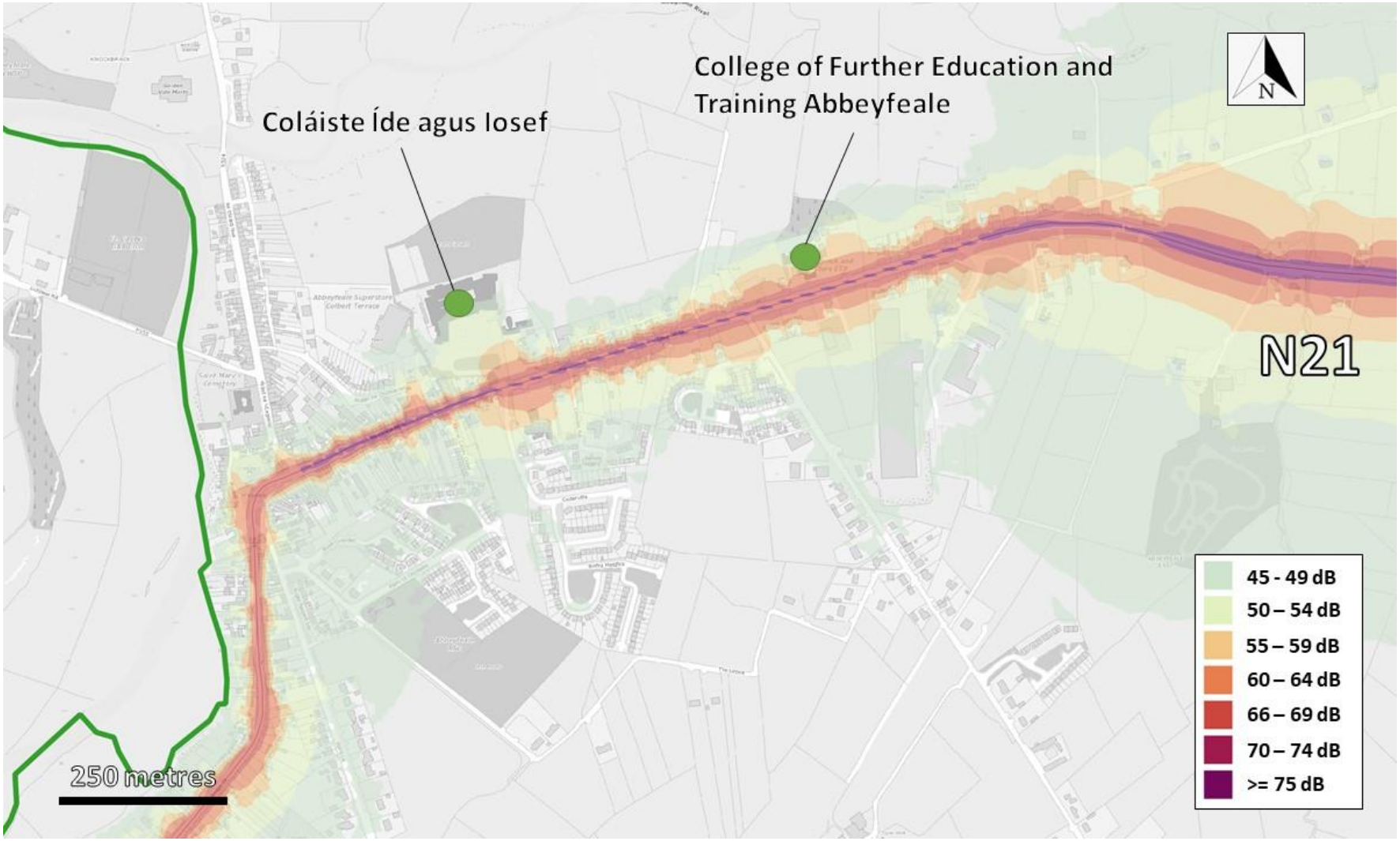

Figure D.2. L_{night} (dB) – N21, Noise Sensitive Buildings in the Abbeyfeale Area.

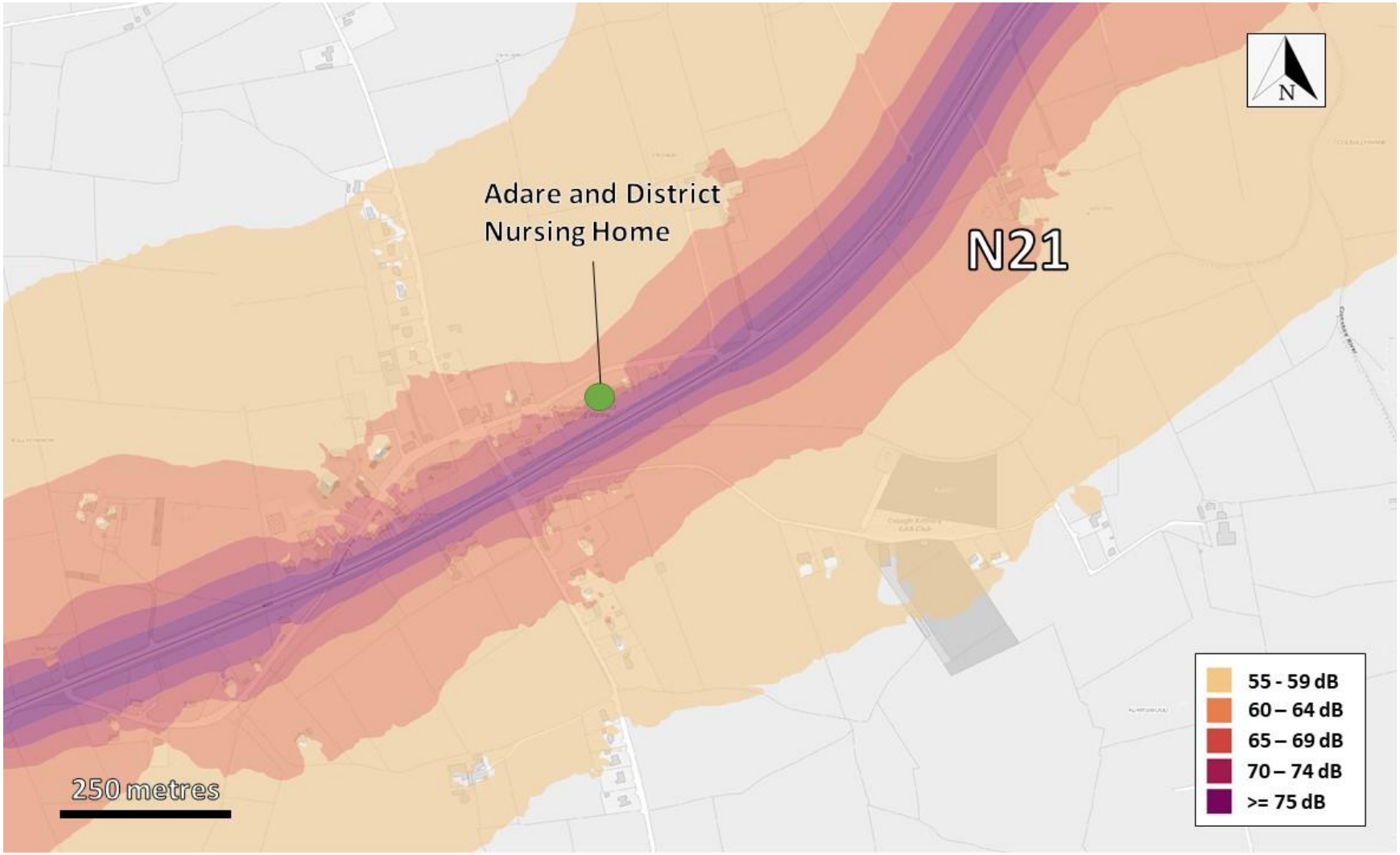

Figure D.3. L_{den} (dB) – N21, Noise Sensitive Buildings in the Croagh Area.

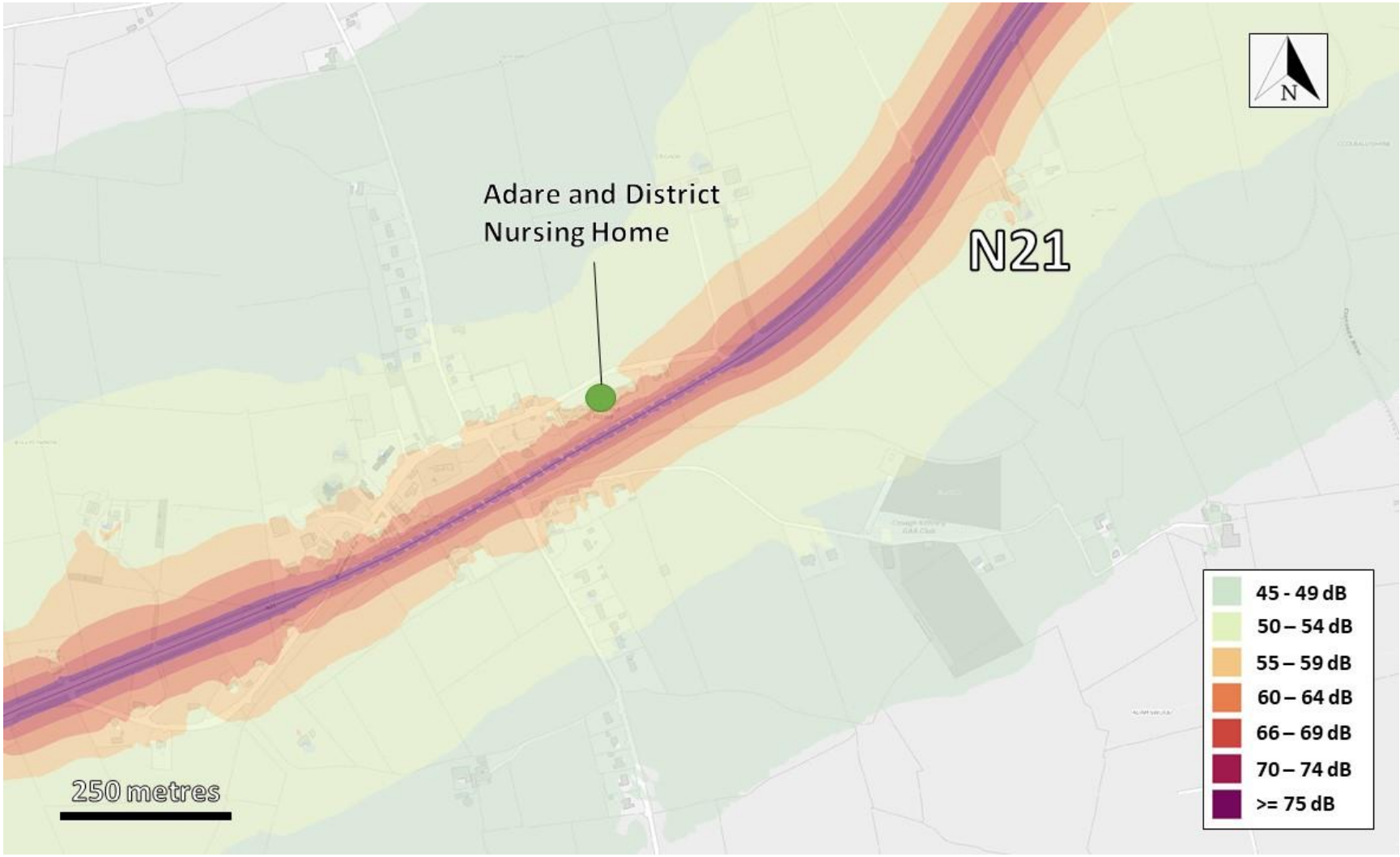

Figure D.4. L_{night} (dB) – N21, Noise Sensitive Buildings in the Croagh Area.

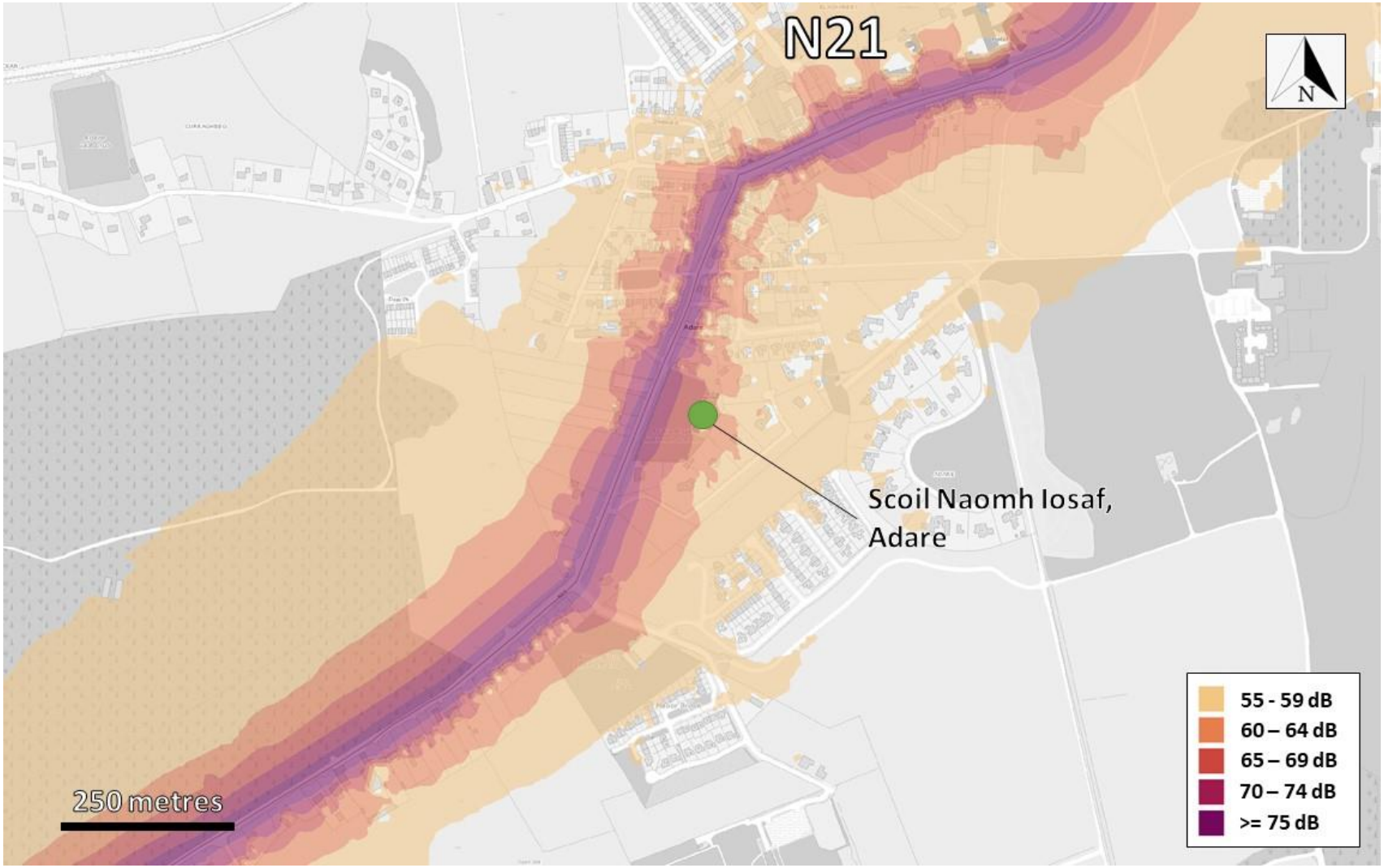

Figure D.5. L_{den} (dB) – N21, Noise Sensitive Buildings in the Adare Area.

Figure D.6. L_{night} (dB) – N21, Noise Sensitive Buildings in the Adare Area.

Appendix E: Round 4 NAP Implementation Measures and Actions

E.1 General – Noise Management Measures

General noise management measures cover a range of activities to support the implementation of the Noise Action Plan including other measures across the three policy principle categories.

Measures LCCC1.1: Noise Action Plan Working Group(s) - Action Planning Authorities and Noise Mapping Bodies

LCCC will support the establishment of relevant noise working groups to co-ordinate and collaborate with other Action Planning Authorities and the relevant Noise Mapping Bodies (e.g. TII, Irish Rail) in respect of noise management issues in general as they may arise and mitigation measures at a Priority Important Area level. LCCC will support the establishment of a National NAP Implementation Working Group.

Measures LCCC1.2: Support the Development of National Noise and Other Related Policy and Guidance

At present there is no national policy relating specifically to environmental noise other than the specific objective set out within National Policy Objective 65 from the National Planning Framework 2040.

LCCC will actively support and engage with the development of national policy and guidance on the subject of environmental noise and all related policy.

Measures LCCC1.3: Report to the Environment Protection Agency (EPA)

LCCC will prepare an annual report for the EPA setting out progress made in respect of the implementation of the NAP including the investigations of Priority Important Areas and implementation of noise mitigation measures for those areas and other general areas.

In addition, progress with respect to the assessment of the Potential Candidate Quiet Areas will be presented together with any recommendations for referring any of these areas to the EPA and the Minister for designating as a Quiet Area. LCCC will liaise with relevant third party infrastructure owners in respect of progress made by them with implementing actions that may be relevant to them and their infrastructure.

Measures LCCC1.4: Continued Investigation and Management of Complaints

LCCC will investigate complaints under the provisions of the Environmental Protection Agency Act 1992 (Noise) Regulations 1994. LCCC will have regard to international best practice, guidelines and standards.

Measures LCCC1.5: Stakeholder Collaboration

LCCC will actively collaborate with a number of stakeholders in relation to managing environmental noise in the Limerick Agglomeration, particularly in identifying and reviewing potential mitigation measures for Priority Important Areas and the investigation of Candidate Quiet Areas.

Measures LCCC1.6: Community Engagement

To date the strategic noise maps, together with background information, has been published on the Councils websites and a period of formal public consultation held on the Draft NAP.

As part of the implementation of the NAP, it is proposed to build on this public engagement for the evaluation of the Priority Important Areas and the implementation of a citizen science approach to the investigation of Candidate Quiet Areas.

Measure LCCC1.7 Manage and maintain the ambient monitoring network

LCCC will continue to manage its noise monitoring network to support work programmes internally, particularly in relation to the Priority Important Areas and Candidate Quiet Areas and will provide online real-time access of data to the public.

E.2 Mitigation – Noise Management Measures

Mitigation noise mitigation measures relate to activities to support the investigation of noise mitigation measures in the Priority Important Areas and engagement with the relevant stakeholders with influence to implement them.

Measures LCCC2.1: Existing Plans, Projects and Strategies

There are a number of existing plans, projects and strategies which aim to deliver more sustainable infrastructure and services for the Limerick Agglomeration. The successful implementation of these will bring indirect benefits for noise reduction through encouraging more sustainable modes of transport in combination with reduced traffic volumes. Key examples with noise benefit synergies include the;

- the Active Travel Programme;
- the Limerick Shannon Metropolitan Area Transport Strategy;
- the Limerick City and County Council Climate Action Plan.

This measure aims to work collaboratively with each of these to support their implementation and engage on aspects for noise management and benefits.

Measures LCCC2.2: Noise Sensitive Buildings

LCCC will support the implementation of plans, projects and strategies that will reduce noise at noise sensitive buildings. Where any proposed projects may have a negative influence on the acoustic environment LCCC will engage with relevant authorities and appraise noise mitigation options where feasible and recommend the most appropriate noise mitigation measure(s) if necessary.

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Measure LCCC2.3: Review the Assumptions used for the Priority Important Areas (PIAs)

LCCC will undertake a review of the Strategic Noise Maps for the PIAs and the assumptions used in the calculation models (e.g. road surfaces, traffic volumes etc.).

Measure LCCC2.4: Appraise Noise Mitigation Measures for PIAs

LCCC will complete an evaluation of the PIAs identified in the NAP. Where the PIA relates to infrastructure that is exclusively the responsibility of and managed by LCCC, then the evaluation will be completed exclusively by LCCC. Where the PIAs relate to infrastructure for which a third party has overall responsibility, then the evaluation will require significant input from the relevant infrastructure owner. The investigation of potential noise mitigation measures for the PIAs will include assessments where feasible of the potential reduction in harmful health effects (as required under the Environmental Noise Regulations 2018) and/or cost benefit assessments, as appropriate. Where the Priority Important Area relates to infrastructure for which a third party has overall responsibility, then the evaluation will require significant input from the relevant infrastructure owner.

Measure LCCC2.5: Implementation of Recommended Noise Mitigation Measures

Subject to the outcome of LCCC2.2, LCCC will implement measures deemed technically, economically, and environmentally justified as part of this round of the NAP or future rounds, contingent upon resources and funding.

Implementation will involve reviewing the effectiveness of the measures through monitoring where appropriate. The implementation of measures related to infrastructure not under LCCC's responsibility should be carried out by the third parties responsible for that infrastructure. LCCC will coordinate with these parties in monitoring progress and reporting to the EPA as part of the annual report.

Consideration will be given to funding sources and will include liaising with relevant internal LCCC sections and projects as well as third parties and government departments with a view to securing funding for relevant measures or ensuring the noise measures are incorporated within existing funding streams for existing projects.

E.3 Prevention – Noise Management Measures

Prevention noise mitigation measures relate to activities to support planning where there may be proposals to bring people to noise from major transportation sources or there is a material consideration of environmental noise required in local area plans and development plans. Prevention measures also relate to maintaining or improving the acoustic environment for new public realm where feasible.

Measures LCCC3.1: Planning Referrals

Relevant Sections in LCCC will report on planning applications and enforcement of planning conditions in relation to noise emissions. In reviewing and advising on planning applications where there is new proposed residential development near major roads the relevant Sections will give due consideration to the existing strategic noise maps and the NAP.

Measures LCCC3.2: Support the development of local authority policies and objectives

LCCC will give due consideration to the NAP in the development of relevant plans (e.g. Local Area Plans, Development Plans), strategies, policies and objectives will be prepared to support them.

Measures LCCC3.3: Support the development of new public realm and green and blue infrastructure

LCCC may have existing plans and projects which aim to deliver new public realm and green and blue infrastructure. This measure aims to work collaboratively with the relevant Sections in LCCC to support their implementation and engage on aspects for noise management and benefits, and to provide appropriate acoustic environments for citizens health and well-being.

E.4 Protection – Noise Management Measures

Measures LCCC4.1: Evaluation of Potential Candidate Quiet Areas (PCQAs)

LCCC will complete an evaluation of each of the PCQAs. The objective of the evaluation process will be to confirm the validity of the PCQA for delimiting as a Quiet Area.

The results of the evaluation will be used to make a recommendation on whether to designate the site as a Quiet Area or not. The public, the EPA and relevant Stakeholders will then be consulted on the outcome before a final proposal for each area is made to the EPA and the Minister.

Measures LCCC4.2: Proposal for Quiet Area(s) Designation

For each of the Candidate Quiet Areas that are recommended for designation as a Quiet Area, a proposal will be prepared setting out the findings of the investigations and the feedback from the consultation process to support the recommendation for the area being designated as a Quiet Area.

This will be consulted with the EPA before being issued to the Minister of the Environment, Climate and Communications to approve the delimitation of the recommended Candidate Quiet Areas as a Quiet Area.

Measure LCCC4.3: Develop and Implement a Citizen Science and Soundscape Approach to the Investigation of PCQAs

In relation to the implementation of Measure LCCC4.1 it may be appropriate for LCCC to evaluate the soundscape of Candidate Quiet Areas through a visitor experience and stakeholder engagement process (e.g. soundwalks), correlating citizens perceived responses to their acoustic environment in the PCQAs to measured acoustic parameters. LCCC will develop and implement a citizen science and soundscape approach to the investigation of the PCQAs.

Comhairle Cathrach
& Contae **Luimnigh**

Limerick City
& County Council

www.limerick.ie