



**Draft Agglomeration of
Limerick Noise Action Plan
2024-2028**

27 March 2024



Comhairle Cathrach
& Contae **Luimnigh**

Limerick City
& County Council



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Executive Summary

Environmental noise remains a major problem in Europe, with at least 20% of the population reported by the European Environment Agency 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 the population (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 2018.

Under the Regulations of 2018, Limerick City and County Council and Clare County Council are designated as the Noise Mapping Bodies and Action Planning Authorities for the purpose of making and approving strategic noise maps and Noise Action Plans, respectively, for the Agglomeration of Limerick (**Figure 1**).

This is the fourth round of noise action planning in Ireland and this is the first Noise Action Plan for the Agglomeration of Limerick. The Plan reports the findings of the strategic noise mapping prepared in consultation with Transport Infrastructure Ireland, Irish Rail and the Environmental Protection Agency (EPA), in respect of the calendar year 2021 for noise from the following sources:

- Road traffic;
- Rail traffic; and
- Industrial activity sites.

The Noise Action Plan has been prepared in accordance with the Regulations and is aimed at strategic long-term management of environmental noise from transport systems. 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 Agglomeration. 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 and Clare County Council are 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 the Agglomeration that potentially provide 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 (2024-2028), with progress reported to the EPA on an annual basis.

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

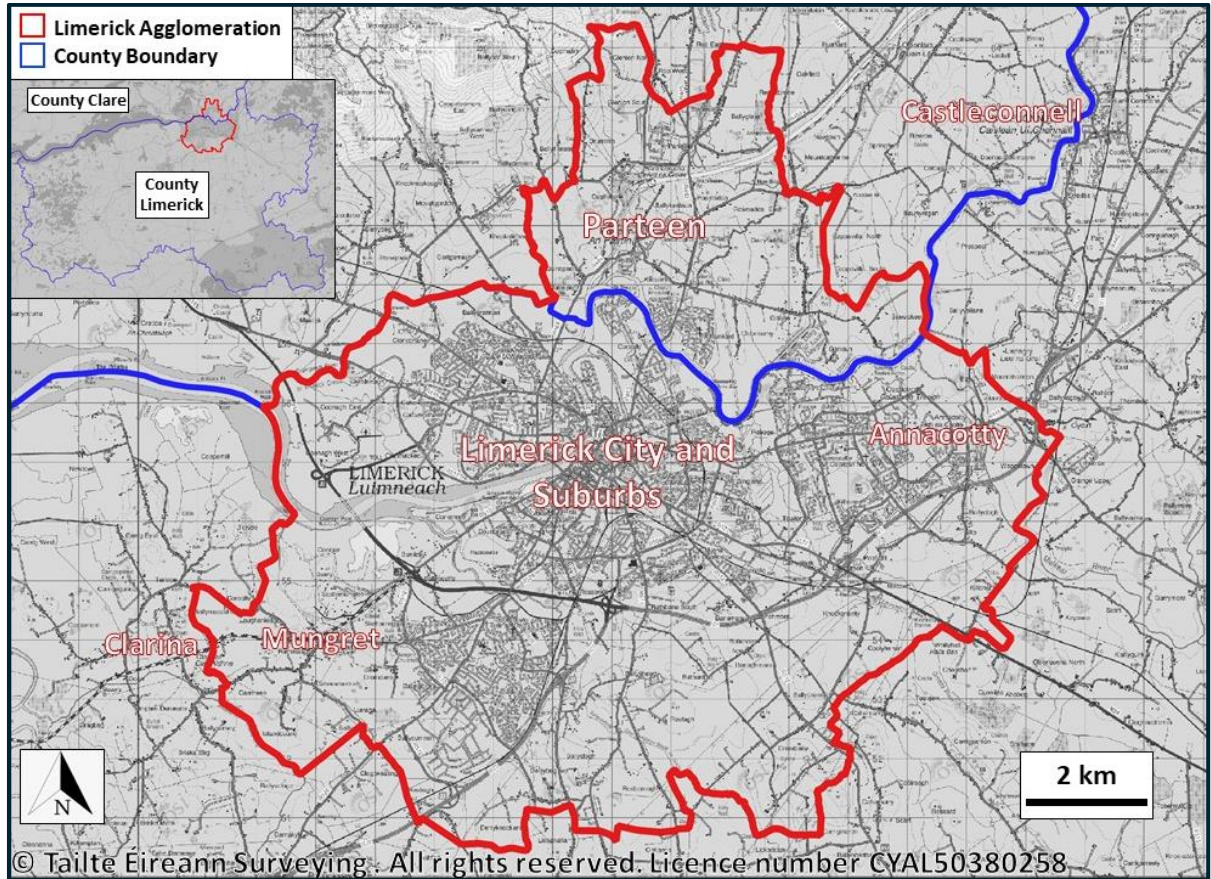


Figure 1. The Agglomeration of Limerick, as defined in the European Communities (Environmental Noise) Regulations, 2018.

NOISE POLICY STATEMENT

Limerick City and County Council and Clare County Council will adopt a strategic approach to managing environmental noise within the Agglomeration of Limerick, 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”.

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1 Introduction

1.1 Purpose of the Limerick Agglomeration 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 2006¹ (S.I. 140/2006) (the “Regulations”). The Regulations were revised by the EC (Environmental Noise) Regulations 2018² (S.I. 549/2018) and amended through the EC (Environmental Noise) (Amendment) Regulations 2021³ (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 the Environmental 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 where it has negative effects on the population, and preserve environmental noise quality in areas where it is good.

In Ireland, it is recommended that the NAPs support National Policy Objective (NPO) 65 from the National Planning Framework 2040⁴, 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.”

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 <https://www.irishstatutebook.ie/eli/2021/si/663/made/en/print> [Accessed March 2024]

⁴ National Planning Framework 2040: <http://www.gov.ie/en/project-ireland-2040/> [Accessed March 2024]

The NAP for the Agglomeration of Limerick (herein termed the “Limerick Agglomeration”), and its subsequent implementation, is critical to ensuring that Limerick City and County Council (LCCC), and Clare County Council (CCC) achieve 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.

The EPA provides guidance (“EPA Guidance”)⁵ 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 regulations, Limerick City and County Council and Clare County Council are designated as the Noise Mapping Bodies for the purpose of preparing strategic noise maps for the Limerick Agglomeration, and in consultation with the EPA, are the Action Planning Authorities responsible for preparing NAP for the Agglomeration.

Limerick City and County Council and Clare County Council must prepare the Limerick Agglomeration NAP in consultation with the EPA and other Noise Mapping Bodies in Ireland – Transport Infrastructure Ireland (TII) and Irish Rail.

1.1.2 Scope of the END

The END is aimed at establishing harmonised European Union 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.

⁵ EPA Noise Action Planning Guidelines, 2024

The END does not apply to noise that is caused by the exposed person themselves, 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) Pre-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 Irish law through the Planning and Development (Strategic Environmental Assessment) Regulations, 2004⁶ (S. I. 436/2006). This legislation has been amended by the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011⁷ (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 2004⁸ (S. I. 435/2004), as amended by European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011⁹ (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, 2011¹⁰ (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 NAP has been assessed to determine if it is required to be subject to an ‘Appropriate Assessment’ 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.

⁶ <https://www.irishstatutebook.ie/eli/2004/si/436/made/en/print> [Accessed March 2024]

⁷ <https://www.irishstatutebook.ie/eli/2011/si/201/made/en/pdf> [Accessed March 2024]

⁸ [S.I. No. 435/2004 - European Communities \(Environmental Assessment of Certain Plans and Programmes\) Regulations 2004 \(irishstatutebook.ie\)](https://www.irishstatutebook.ie/eli/2004/si/435/made/en/print) [Accessed March 2024]

⁹ [S.I. No. 200/2011 - European Communities \(Environmental Assessment of Certain Plans and Programmes\) \(Amendment\) Regulations 2011. \(irishstatutebook.ie\)](https://www.irishstatutebook.ie/eli/2011/si/200/made/en/print) [Accessed March 2024]

¹⁰ <https://www.irishstatutebook.ie/eli/2011/si/477/made/en/print> [Accessed March 2024]

1.2 Scope of the Limerick Agglomeration Noise Action Plan

The Limerick Agglomeration NAP has been prepared in accordance with the Environmental Noise Regulations and is aimed at strategic long-term management of environmental noise referring to the results of the strategic noise maps to inform assessments of population exposure and harmful effects of noise.

The strategic noise maps for the Limerick Agglomeration have been prepared in consultation with TII, Irish Rail and the EPA for environmental noise from the following sources:

- **Road traffic** – all roads and major roads (sections of road with a flow above a threshold of 3 million vehicle passages per year);
- **Rail traffic** – all rail and major rail (sections of rail route with a flow above a threshold of 30,000 train passages per year);
- **Industrial activity sites** - Industrial Emission (IE) sites¹¹.

Consequently, the NAP is concerned with noise from all road traffic, all rail traffic and Industrial Emission sites selected for inclusion by the EPA¹².

The regulations require the strategic noise mapping to be based upon an assessment year of 2021. Due to COVID-19 related travel restrictions and the operational impacts of the pandemic, noise contour results for 2021 may be considered as not being fully representative. However, 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. As rail and road traffic travel reductions did not generally reduce by these magnitudes, the use of the 2021 assessment year is deemed suitable for the purpose of the Round 4 noise action planning.

The previous three rounds of strategic road noise mapping for Limerick has used an ‘interim’ calculation method, CRTN 1988¹³. For the Round 4 of noise mapping a common noise assessment method has been implemented (Common Noise Assessment Methods in Europe, CNOSSOS-EU¹⁴) in

¹¹ The selected industrial emission sites are those regulated by the EPA under the IPPC Directive 96/61 EC

¹² There are no airports that exceed the threshold of 50,000 movements per year requiring strategic noise mapping for the Limerick Agglomeration. The port in Limerick City (Limerick Docklands) has not been mapped because noise emissions from the site are regulated by Limerick City and County Council under waste facility permitting and are not an EPA regulated activity.

¹³ Department of Transport (UK), Calculation of Road Traffic Noise (CRTN), HMSO, 1988

¹⁴ <https://op.europa.eu/en/publication-detail/-/publication/80bca144-bd3a-46fb-8beb-47e16ab603db> [Accessed March 2024]

line with Annex II of the END 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 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*”¹⁵.

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.

Calculations of supplementary noise indicators have also been undertaken, namely the $L_{Aeq,16hr}$ (the annual average noise level for the daytime/evening periods, from 07:00 – 23:00 hours), which has been approved by the EPA as the appropriate noise indicator to inform the identification of Candidate Quiet Areas.

1.4 Limerick Agglomeration

The Limerick Agglomeration is defined in the Environmental Noise Regulations (**Appendix B**) and constitutes areas in County Limerick and County Clare.

The Limerick Agglomeration covers an area of 115.7 km² (where the administrative areas of Limerick City and County Council, and Clare County Council cover 93.3 km² and 22.4 km², respectively) with a population of 101,029, and its boundary is shown in **Figure 1.1**.

¹⁵ Section 12(2) of the Environmental Noise Regulations 2018.

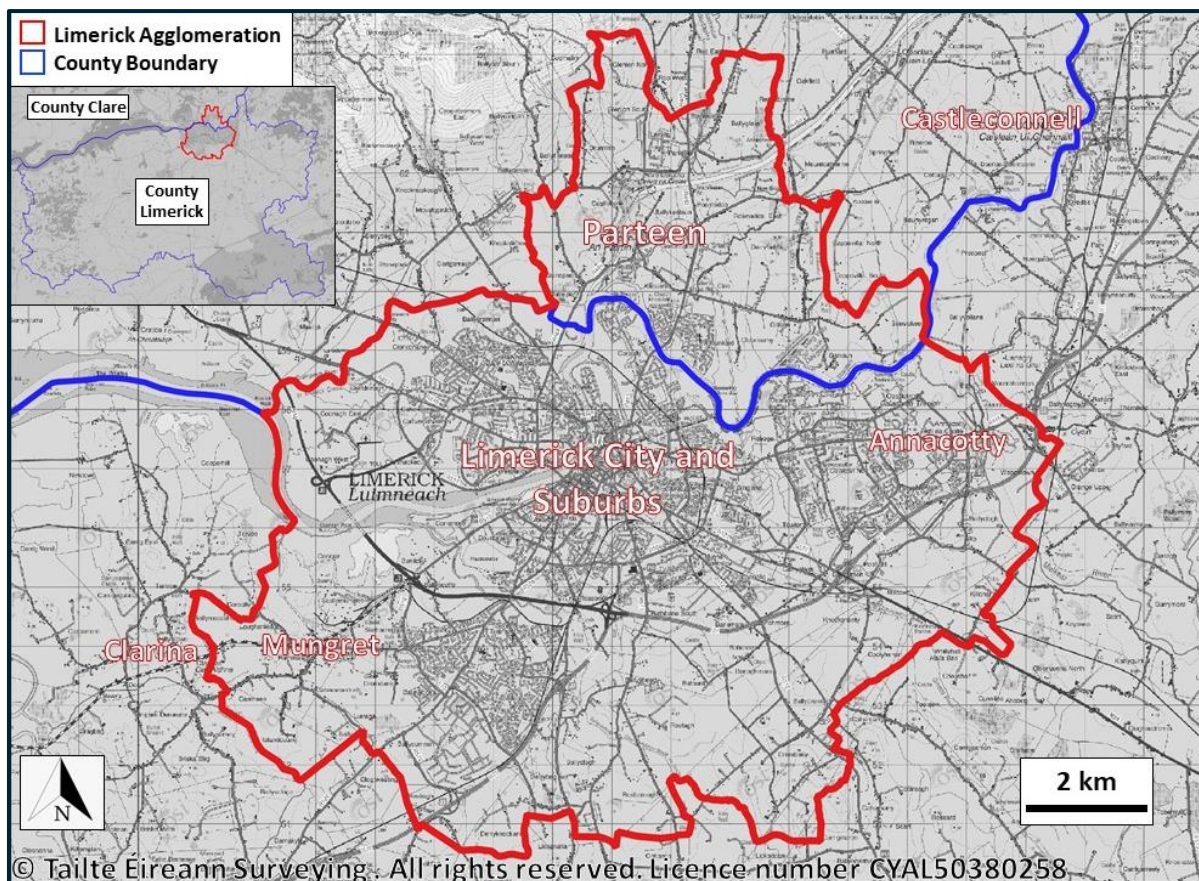


Figure 1.1. The Agglomeration of Limerick, as defined in the European Communities (Environmental Noise) Regulations, 2018.

A summary of the populations for County Limerick and County Clare in the Agglomeration is presented in **Table 1.1**.

Table 1.1. Limerick Agglomeration – Total population.

Limerick Agglomeration	County Limerick	County Clare
101,029	94,469	6,560

The total length of road and railway, and the total number of industrial sites included in the Agglomeration strategic noise maps are summarised in **Table 1.2**.

Table 1.2. Limerick Agglomeration - Summary of noise sources in strategic noise maps.

Noise Sources	Total Length/No. of Sites (metres, m)
All Roads (including Major Roads)	637,835 m
Major Roads	110,361 m
All Rail (including Major Rail)	29,300 m

Noise Sources	Total Length/No. of Sites (metres, m)
Major Rail	0 m
Industry	7 sites

The number of noise sensitive buildings (schools and hospitals) within the Limerick Agglomeration and considered by the strategic noise mapping are summarised in **Table 1.3**.

Table 1.3. Agglomeration - Total number of Noise Sensitive Buildings.

Noise Sensitive Building	Number of Noise Sensitive Buildings in the Strategic Noise Maps
Schools	104
Hospitals	14

1.5 Structure of the NAP

Two NAPs were required for the administrative areas of Limerick City and County Council and Clare County Council for Round 3 of the noise action planning. Round 4 is the first round that a NAP is required for the Limerick Agglomeration.

The first part of the NAP covers the overarching principles of the process, including the legal context, and a review of the measures undertaken in the area of the Limerick Agglomeration under the Round 3 NAPs (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 the Limerick Agglomeration to be considered for noise mitigation, with the suite of potential measures, and Candidate Quiet 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.

1.6 Round 4 Timetable

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:

- January-March 2024: Prepare draft NAPs;
- 5 April to 17 May 2024: Public consultation for the Limerick Agglomeration (6 weeks);
- 18 July 2024: Deadline for submission of the NAPs 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.

1.7 Public Consultation

As part of the consultation process 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.

1.8 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>).

2 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 2018’¹⁶ (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 Europe¹⁷.

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**.

¹⁶ Environmental Noise Guidelines for the European Region, World Health Organisation, 2018

¹⁷ Environmental Noise in Europe – 2020, EEA Report 22/2019

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, above which the onset of health effects are observed in the population and which the WHO strongly recommend that policymakers reduce the populations exposure below are:

- 53 dB L_{den} and 45 dB L_{night} for road noise;
- 54 dB L_{den} and 44 dB L_{night} for rail noise; and
- 45 dB L_{den} and 40 dB L_{night} for aircraft noise.

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)¹⁸ (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 needs 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 on 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

¹⁸ EU Action Plan: Towards a Zero Pollution for Air, Water and Soil, 2021

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)¹⁹, EC (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S. I. 435/2004)²⁰ and EC (Birds and Natural Habitats) Regulations 2011 (S. I. 477/2011)²¹ implement the relevant environmental Directives into Irish law.

2.4 Noise and Statutory Provisions

The Environmental Protection Agency Act, 1992²², is not related to the making of NAPs but includes national legislation 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
- 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).

¹⁹ <https://www.irishstatutebook.ie/eli/2004/si/436/made/en/print> [Accessed March 2024]

²⁰ <https://www.irishstatutebook.ie/eli/2004/si/435/made/en/print> [Accessed March 2024]

²¹ <https://www.irishstatutebook.ie/eli/2011/si/477/made/en/print> [Accessed March 2024]

²² <https://www.irishstatutebook.ie/eli/1992/act/7/enacted/en/print> [Accessed March 2024]

2.5 Noise and Transportation

The EC Phenomena Project, 2021²³ 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%. For rail noise, the noise abatement solutions considered included smooth tracks, quieter vehicles, smooth wheels and quieter tracks. It is reported that a combination of all abatement measures for railways can achieve a health burden reduction by 2030 in the range 37% to 52%.

National Roads 2040²⁴ (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 2040²⁵ 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 2023²⁶ 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

²³ European Commission Assessment of Potential Health Benefits of Noise Abatement Measures in the EU (Phenomena Project), 2021

²⁴ National Roads 2040, TII, 2023

²⁵ National Planning Framework – Ireland 2040 Our Plan, Department for Housing, Local Government and Heritage, 2018

²⁶ Climate Action Plan 2023, Department of Environment, Climate and Communications, 2022

NR2040 there is no national funding mechanism available to implement abatement measures where they might be recommended through NAPs.

In Ireland, the Roads Act, 1993²⁷ (revised 2023²⁸), 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, 2009²⁹. 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' (2004³⁰, revised by TII in 2014³¹). 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} less than, or equal to, 60 dB (free-field value). Any proposed new road scheme must consider 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.

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 - 2030³². 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

²⁷ <https://revisedacts.lawreform.ie/eli/1993/act/14/revised/en/html> [Accessed March 2024]

²⁸ <https://revisedacts.lawreform.ie/eli/1993/act/14/revised/en/html> [Accessed March 2024]

²⁹ <https://www.irishstatutebook.ie/eli/2009/act/37/enacted/en/print> [Accessed March 2024]

³⁰ Guidelines for the Treatment of Noise and Vibration in National Road Schemes, NRA, 2004

³¹ Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, TII, 2014

³² Ireland's Government Road Safety Strategy (2021 - 2030) - Our Journey Towards Vision Zero

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 All-Island Strategic Rail Review was launched by the Department of Transport in 2021. The Review focuses on how the rail network across the island can contribute to the decarbonisation of the island's transport systems, promote sustainable connectivity into and between major cities, enhance regional accessibility, and support balanced regional development. If the Review's recommendations are implemented then negative impacts on the environment are expected to be reduced through a reduction in carbon emissions and an increase in the overall modal share for travel. The Review does not make specific reference to environmental noise but at a strategic level there is the potential to reduce noise emissions nationally across the transportation sector by the proposed doubling of the modal share of rail.

Under the powers conferred under Section 37 of the Transport (Railway Infrastructure) Act 2001 (as amended and substituted) any application for a new railway order requires an environmental impact assessment report which must take consideration of the impact by noise. There are no statutory standards relating to noise limit values for the operational phase of new railway routes.

2.5.1 Relevant Regional and Local Policies and Objectives

At a regional scale the Mid-West Area Strategic Plan 2012-2030³³ seeks to reduce car dependency and supports the provision of high-quality active travel routes linking residential, commercial and employment areas throughout Limerick and the Mid-West Region. Similarly, the Limerick Shannon Metropolitan Area Transport Strategy³⁴ (LSMATS), prepared by the National Transport Authority (NTA), in collaboration with Limerick City and County Council, Clare County Council and TII, and which includes the area of the Limerick Agglomeration, focuses on reducing car dependency within the city of Limerick, thereby alleviating issues such as air pollution, with mutual gains potentially for noise reduction.

³³ Mid-West Area Strategic Plan 2012-2030: Planning, Land Use and Transportation Strategy, Mid-West Regional Authority, 2013

³⁴ Limerick Shannon Metropolitan Area Transport Strategy, NTA, 2023

Objectives in the Limerick Development Plan 2022-2028³⁵ (LDP) and Clare Development Plan 2023-2029³⁶ (CDP) facilitate the implementation of the LSMATS (Objective TR O5 and CDP 11.2 respectively). The LSMATS combines land use and transport planning to discourage private vehicle use and prioritise walking, cycling and public transport. The Limerick BusConnects Programme supports the LSMATS to deliver an improved bus service across the City and suburbs. The LDP also has supporting objectives for Limerick City to provide park and ride ('and stride') facilities, support car sharing and a switch to electric vehicles and bikes and compressed natural gas vehicles. The CDP has similar objectives to decarbonise the transport sector and reduce reliance on private cars and achieve modal shift to sustainable transportation.

Limerick City and County Council introduced byelaws that came into effect in February 2024 to reduce the speed limit on roads in Limerick City Centre to 30km/hr³⁷ (**Figure 2.2**). The move is to be followed by a number of junction redesigns which will see the installation of traffic calming, all of which has the potential to reduce traffic-related noise in Limerick City.

Both the LDP and CDP recognise that green corridors and greenways have an important role in supporting and promoting active travel such as for walking and cycling. Transitioning towards sustainable modes of travel is also a key in the Draft Limerick and Clare Climate Action Plans^{38,39}. In addition, the Limerick Metropolitan Cycle Network Study⁴⁰ recognises the fundamental role of active travel in encouraging a shift from unsustainable modes of travel. The Study not only encourages active travel, thereby reducing carbon and noise emissions associated with transport, but also recognises it as providing recreational and leisure opportunities contributing towards improvements to quality of life.

The LDP 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. Limerick City and Environs Green and Blue Infrastructure (GBI) Strategy⁴¹ outlines the need to prioritise GBI

³⁵ <https://www.limerick.ie/council/services/planning-and-placemaking/development-plan-strategies/limerick-development-plan-0>
[Accessed March 2024]

³⁶ [Stage 3 - Adoption of Plan | Stage 3: Amendments | Clare County Council \(clarecoco.ie\)](#) [Accessed March 2024]

³⁷ Limerick City Centre 30 km/h Speed Limit Bye-laws 2023

³⁸ Draft Limerick Climate Action Plan 2024-2029

³⁹ Clare Climate Action Plan 2024-2029

⁴⁰ ARUP and Limerick City and County Council, Limerick Metropolitan Cycle Network Study, 2019

⁴¹ Limerick City and Environs Green and Blue Infrastructure Strategy, Limerick City and County Council, 2023

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 the County Limerick. The consideration of the identification and investigation of Quiet Areas is also relevant to Limerick City and County Council's development of the Limerick Public Realm Strategy⁴².

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 on the population. However, there is no national noise planning guidance to support planning authorities in decision-making. Siting 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 Regulations⁴³ does not provide any requirements for the type and location of new buildings beside 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, 2019⁴⁴) 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 Development⁴⁵ (ProPG, 2017), Acoustic Ventilation and Overheating, Residential Design Guide⁴⁶ (AVO, 2021), BS 8233:2014 Guidance on sound Insulation and Noise Reduction for Buildings⁴⁷ and ISO 19488:2021 Acoustics: Acoustic classification of dwellings⁴⁸.

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

⁴² <https://mypoint.limerick.ie/en/consultation/limerick-public-realm-strategy> [Accessed March 2024]

⁴³ <https://www.gov.ie/en/publication/1d2af-building-regulations/> [Accessed March 2024]

⁴⁴ <https://www.irishstatutebook.ie/eli/2019/si/263/made/en/print> [Accessed March 2024]

⁴⁵ Professional Planning Guidance on Planning & Noise: New Residential Development, IOA, ANC, CIEH, 2017

⁴⁶ Acoustic Ventilation and Overheating, Residential Design Guide, IOA, ANC, 2020

⁴⁷ BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings, British Standards Institution, 2014

⁴⁸ ISO 19488:2021 Acoustics: Acoustic Classification of Dwellings, Organization for International Standardization, 2021

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 residential buildings.

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

**See BS 8233:2014 for caveats and notes.*

In the absence of national planning guidance local authorities in 2021 prepared the Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development⁴⁹ (2021), 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 in 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.

⁴⁹ Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development, NIECE Local Authority Noise Subgroup, 2021

2.6.1 Relevant Regional and Local Policies and Objectives

The aims of NPO 65 feed 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^{50,51,52,53}.

The LDP and CDP have objectives to promote the pro-active management of noise where it is likely to have significant adverse impacts on health and the environment. In the LDP road traffic-related noise is given consideration in Chapter 7: Sustainable Mobility and Transport and Chapter 11: Development Management Standards i.e. 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 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 in the LDP 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 considered.

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

The CDP requires that all proposals for development relating to transportation infrastructure shall comply with the provisions of the Clare NAP (2018 to 2023) and any subsequent plans.

These points highlight some of the main steps which Limerick City and County Council and Clare 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.

⁵⁰ Regional Spatial and Economic Strategy for the Southern Region, 2020

⁵¹ Mid-West Area Strategic Plan: Planning, Land Use and Transportation, Mid-West Regional Authority, 2012-2030

⁵² Limerick Corporate Plan 2019-2024, Limerick City and County Council

⁵³ Limerick Development Plan 2023-2028, Limerick City and County Council

International	WHO Environmental Noise Guidelines for the European Region, 2018					
European Union	Directive 2002/49/EC (Environmental Noise Directive)		Directive 2015/996			
	Directive 2020/367		Directive 2001/42/EC (SEA Directive)			
	Directive 85/337/EEC (EIA Directive)	Directive 92/43/EEC (Habitats Directive)		EC Zero Pollution Action Plan, 2021		
	EC Phenomena Project, 2021		EEA Environmental Noise in Europe - 2020			
National	Environmental Protection Agency Act, 1992	Irish Roads Act, 1993 (Revised 2023)		Building Regulations, 1997-2017		
	EC (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations, S.I. 200/2011	Planning and Development (Strategic Environmental Assessments) (Amendment Act) Regulations, S.I. 201/2011		EC (Birds and Natural Habitats) Regulations, S.I. 477/2011		
	EC (Environmental Noise) Regulations, S.I. 549/2018		EC (Environmental Noise) (Amendment) Regulations, S.663/2021			
	Project Ireland 2040 – NPF, 2017	National Development Plan (NDP) 2021-2030	Climate Action Plan, 2023	National Roads 2040		
	TII Guidelines, 2014		EPA Noise Action Planning Guidance, 2023		Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development, 2021	
	Regional	Mid-West Area Strategic Plan 2012-2030		RSES for the Southern Region, 2020		LSMATS, 2022
Local	Limerick and Clare Corporate Plans 2019-2024	Limerick Development Plan 2023-2028	Clare County Development Plan 2023-2029	Limerick City Centre 30 km/h Speed Limit Bye-laws 2023	Local Area Plans	
	Limerick BusConnects		Limerick and Clare Climate Action Plans 2019- 2024	Limerick City and Environs GBI Strategy, 2023	Limerick Metropolitan Cycle Network Study, 2021	

 Guidance in R4 NAP	 Legislation in R4 NAP	 Research/evidence supporting R4 NAP	 Policy/Strategy in R4 NAP
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Figure 2.1. Existing legislation and guidance influencing noise management.

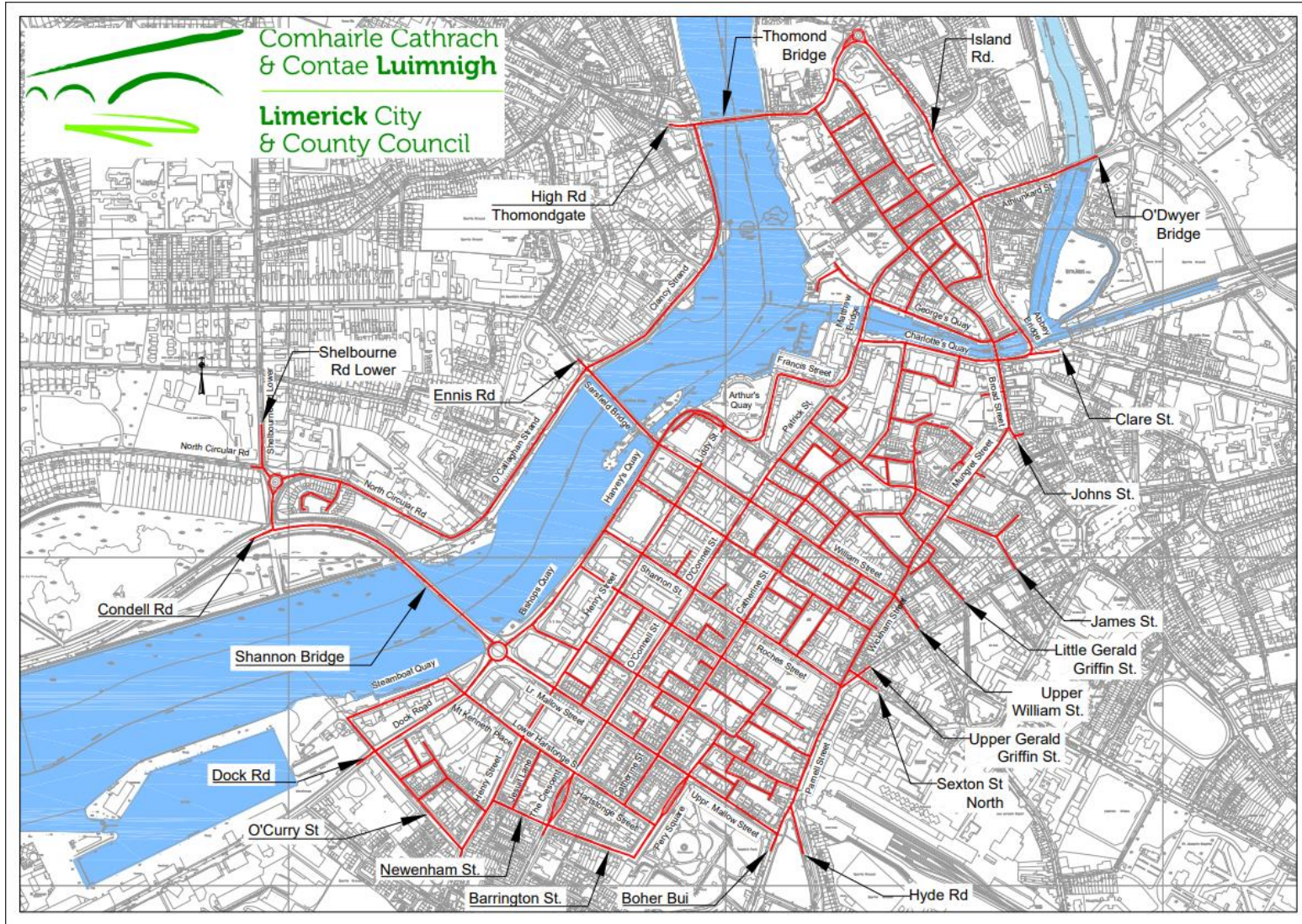


Figure 2.2. Speed limit zone under the Limerick City Centre 30 km/h Speed Limit Byelaws 2023.

3 Review of Round 3 Noise Action Plan (2018-2023)

3.1 Introduction

The following is a review of the measures undertaken in the administrative areas of Limerick City and County Council and Clare County Council in the Limerick Agglomeration over the period of the Round 3 NAP 2018-2023.

3.2 Limerick City and County Council

The Limerick Noise Action Plan 2018-2023 was concerned with environmental noise from major roads alone because the Limerick Agglomeration had not been defined in the Environmental Noise Regulations, at the time the NAP 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 Priority Important Areas in this NAP);
- Developing and implementing a method to assess the cost benefit of noise mitigation works to reduce the potential harmful health effects of traffic-related noise for three Hotspots along sections of 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 reviewing and reporting on planning applications;
- Aiding 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 the use of a citizen science and soundscape approach to identify and investigate them⁵⁴.
- Expanding the network of noise monitoring in the City and Environs to the Go Green Routes Castletroy Greenway Project and Active Travel programme of works.

⁵⁴ Where soundscape is described as the 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.

3.2.1 Mitigation

Fourteen areas, termed ‘Hotspots’, were identified under the Round 3 NAP. These were residential areas where the population was expected to be exposed to undesirable levels of road noise and were identified based on a prioritisation matrix outlined in the EPA Guidance (2009), with criteria for the onset of assessment above 70 dB L_{den} and 55 dB L_{night} .

Twelve of the Hotspots were located in the area now defined as the Limerick Agglomeration, including:

Limerick City (Figure 3.1):

1. R510, Dock Road;
2. R526, O’Connell Street;
3. R527, Upper Gerald Griffin Street/Upper William Street;
4. R527, Mulgrave Street;
5. R445, Clare Street;
6. Kings Island.

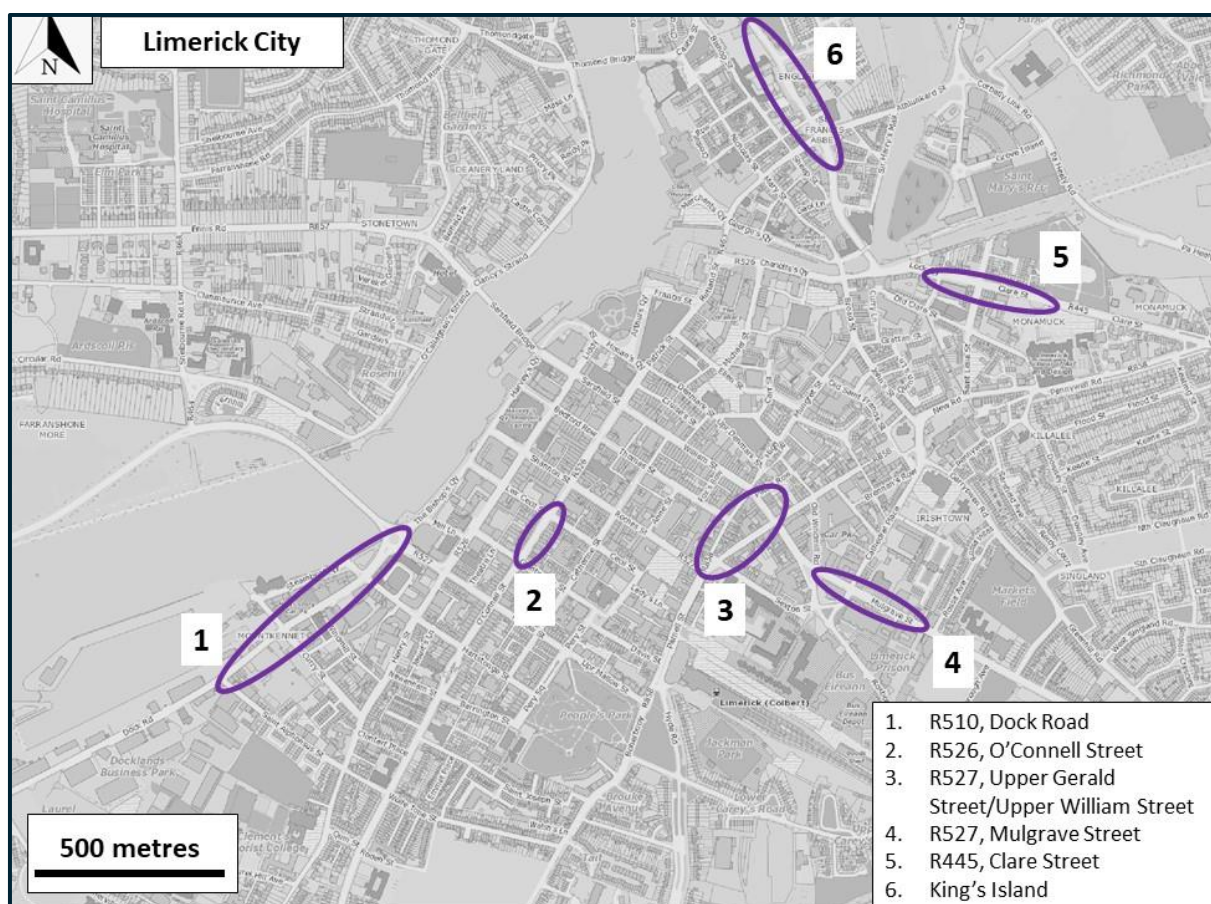


Figure 3.1. Limerick City: Round 3 NAP Hotspots.

Dooradoyle/Gouldavoher (Figure 3.2):

- 7. R526, Ballinacurra Road;
- 8. R526, Dooradoyle;
- 9. R510, Baunacloka;
- 10. R526, Gouldavoher;
- 11. M20, Ballycummin.

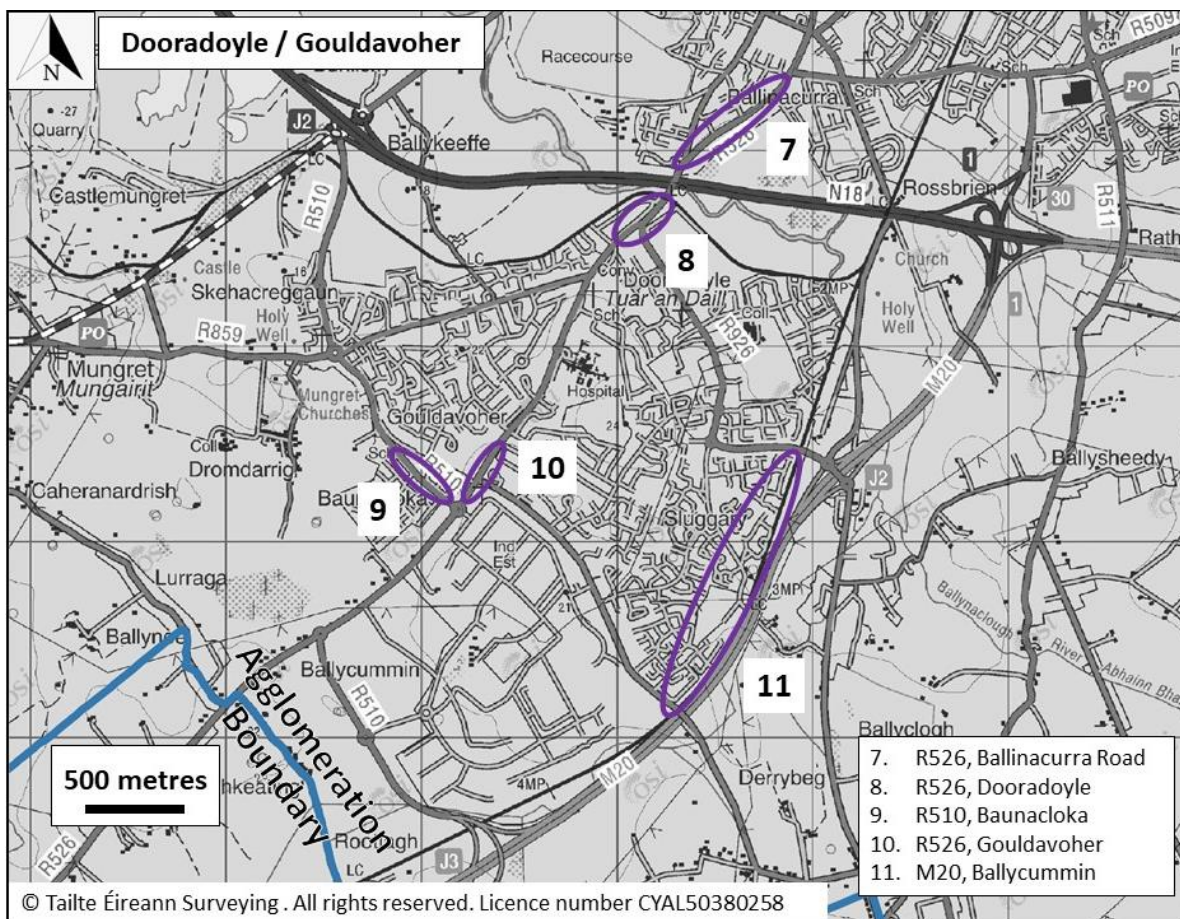


Figure 3.2. Dooradoyle/ Gouldvoher: Round 3 NAP Hotspots.

Castletroy/Monaleen (Figure 3.3):

12. M7, Southern Ring Road, Evanwood/Kylemore/Cherryfield/ Thornfield Estates/Monaleen Road.

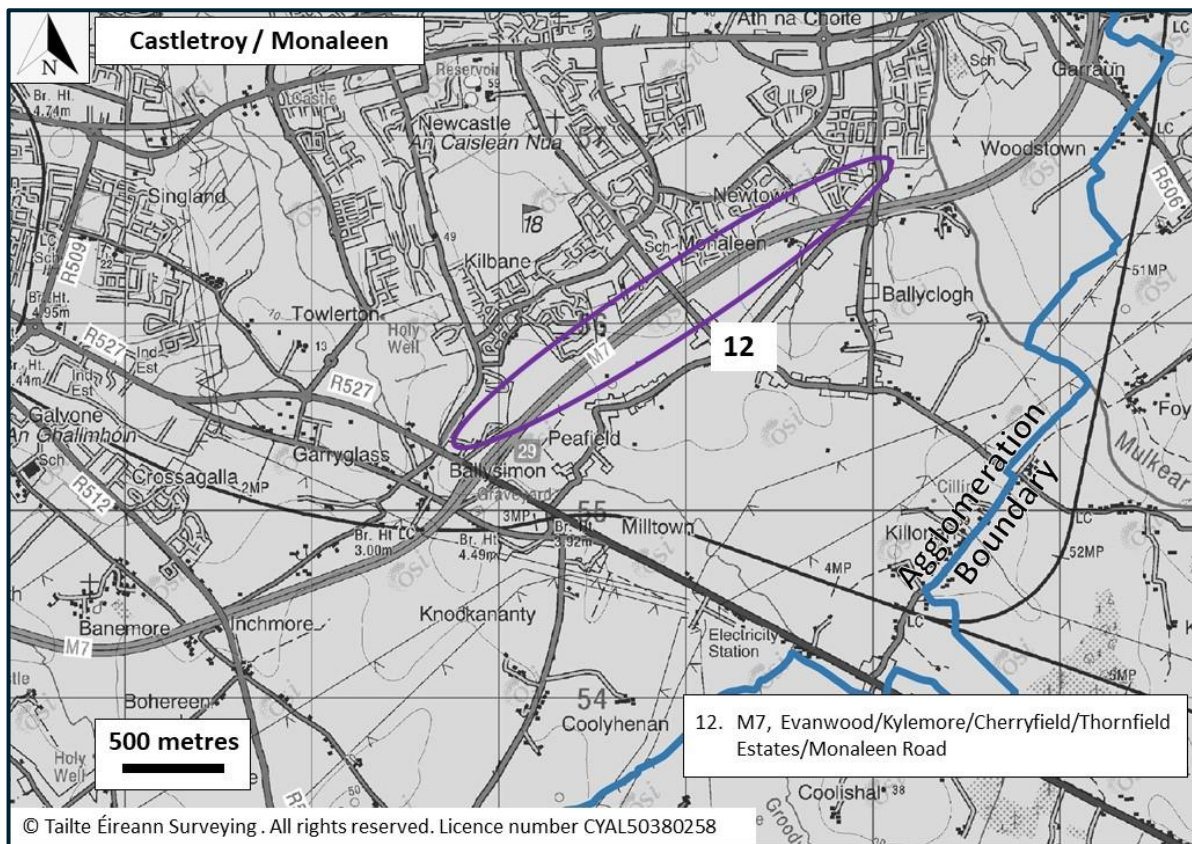


Figure 3.3. Castletroy/Monaleen: Round 3 NAP Hotspot.

3.2.2 Mitigation for Sections of Major National Roads

The focus of the Council’s effort in relation to noise mitigation during the NAP was addressing noise where it is an issue from sections of major national roads: at Ballycummin adjacent to the M20 (Hotspot 11, **Figure 3.2** and **3.4**) and at Castletroy/Monaleen adjacent to the M7 (Hotspot 12, **Figure 3.3**).

These are areas which the Council historically have received complaints regarding noise effecting residents health and well-being, as well as loss of their outdoors private amenity.



Figure 3.4. The M20 motorway adjacent to Ballycummin (Hotspot 11).

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 WebTAG⁵⁵, modified in an Irish context. The two cost benefit assessments the Council undertook in the Limerick Agglomeration were 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 (Option A), a change of road pavement to a low noise road surface -

⁵⁵<https://www.gov.uk/government/publications/tag-unit-a3-environmental-impact-appraisal> [Accessed March 2024]

from Hot Rolled Asphalt (HRA) to Stone Mastic Asphalt (SMA) (Option B) and a combination of changing the pavement and barriers (Option C).

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 studied measures (Options A, B and C) 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 (Option B) between Junctions 28 and 30, because it was the most cost-effective measure (**Figure 3.5**). Those works were undertaken between July and October 2022.

Limerick City and County Council is the first local authority in Ireland to have undertaken cost benefit assessments to review noise mitigation measures for areas that communities are potentially exposed to the harmful effects of noise.



Figure 3.5. Resurfacing of the M7 motorway near Castletroy (between Junctions 28 and 29) with the southbound carriageway (left) complete in the photograph.

3.2.3 Mitigation Measures in Limerick City and Environs

The measure likely to have the greatest impact on reducing road traffic noise levels at Hotspots in Limerick City and Environs (Hotspots 1 to 10) is the Limerick Shannon Metropolitan Area Transport Strategy (LSMATS). The LSMATS sets out the framework for the delivery of the transport system required to further the development of the Limerick Shannon Metropolitan Area. The final LSMATS was published in December 2023. Objectives of the strategy are discussed in **Section 7.2**.

One of the most significant developments in Limerick City during the Round 3 NAP has been the public works to revitalise O’Connell Street (completed at the end of 2023). Traffic for private vehicles has been cut from two lanes to one lane and dedicated cycle lanes and public transport infrastructure have also been put in place. While the works have not specifically targeted a reduction in noise from traffic they will act as a traffic calming measure, potentially reducing road noise.

The Council has continued a program of installing active travel routes to improve access to the City Centre for public transport and cyclists. This will encourage commuters and recreational users to take these routes and encourage a modal shift away from using private vehicles, potentially reducing noise in the city and environs.

The development of active travel routes has involved upgrading the existing road corridors to provide lanes that give priority to bus transport and cyclists. Green Routes in the City that have been completed are presented in **Figure 3.6**.



Figure 3.6. Existing, approved, under construction and proposed active travel routes in the Metropolitan Area of Limerick.

An example of active travel works that have been completed at one of the Hotspots is the Quins Cross to Raheen Roundabout Improvement Scheme at Baunacloka (Hotspot 9, **Figure 3.2**). The scheme includes cycle paths and a narrowing of the road for vehicles which encourages roads users to reduce speeds, particularly in the area of the Saint Nesson’s National School, which will potentially reduce road noise.

Extending from the Limerick Agglomeration to County Limerick there is the University of Limerick (UL) to Montpellier Greenway Scheme which is currently being undertaken and is in Phase 2 of Planning and Design. A network of route options are currently under consideration through a public consultation process.

3.2.4 Other Measures

The Council each year invests in significant traffic calming measures such as speed cushions, speed ramps, tabletop 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.

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.

The Council has made streetscape in the City available to the ESB for electricity car charge points. This will encourage the use of electric cars which emit less road noise at low speeds through the City.

3.2.5 Noise Monitoring

Over the period of the Round 3 NAP the Council has undertaken fixed sound pressure level monitoring at the junction of O’Connell Street and William Street in Limerick City (**Figure 3.7**), to allow comparison with the strategic noise mapping outputs.

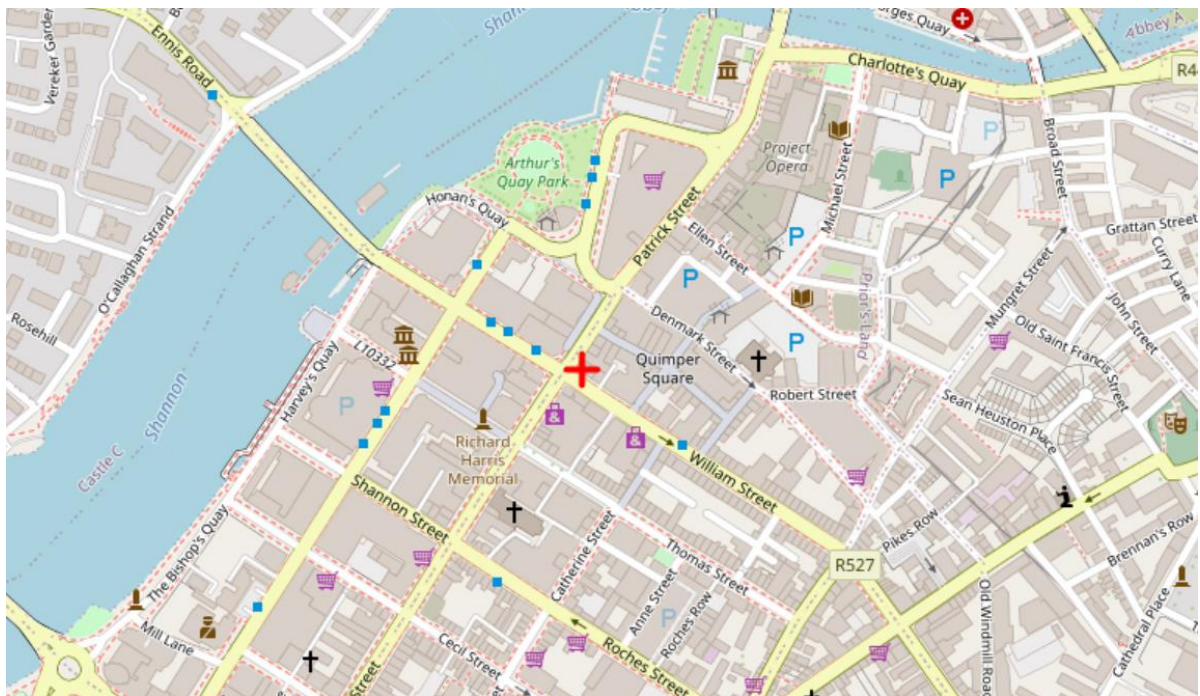


Figure 3.7. Location of the Limerick City and County Council’s fixed sound pressure level monitor at O’Connell Street and William Street in Limerick City (marked by the red cross, Source Google (2024) Limerick Rick. Available at: <http://maps.google.co.uk> [Accessed March 2024]).

The results of the monitoring at the junction of O’Connell Street and William Street are presented in **Table 3.1**, including the results of the Round 4 strategic noise mapping.

Table 3.1. Results of the monitoring at O’Connell Street and William Street Junction.

Year	Monitoring Results					Strategic Noise Mapping 2021	
	L _{Aeq, 16hr} , dB	L _{den} , dB	L _{day} , dB	L _{evening} , dB	L _{night} , dB	L _{den} , dB	L _{night} , dB
2019	71.3	75.5	71.5	70.5	68.3		
2020	70.3	73.3	70.5	69.5	65.3		
2021	70.6	73.0	70.8	69.7	64.4	70-74	55-59
2022	70.9	73.3	71.4	68.9	65.0		
2023	70.6	73.0	71.1	68.8	64.5		

Road noise is expected to be the dominant noise source at the monitoring location. The measured L_{den} result for 2021 correlates well with the result from the strategic noise mapping. However, the measured L_{night} level is higher than the predicted level. This might be due to either the noise strategic noise model underestimating the actual L_{night} from road noise and/or that noise at night is influenced by other sources as well e.g. the night-time economy.

3.2.6 Prevention

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 practice. 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 flexibility through planning where proposed new residential developments are near major roads. Where proposed residential developments are within the building lines for public roads (provided in the Development Management Standards in the LDP) then good acoustic design needs to be demonstrated to reduce the harmful effects to health of road noise.

The Council has also been a lead member of a subgroup of the Local Authority Noise Action Plan Working Group, along with Kildare County Council, in the preparation of the Draft National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development (2021).

During the life of the Round 3 NAP 2018-2023 the Council has reviewed planning applications for approximately 3,000 residential units associated with developments adjacent to major roads in the Limerick Agglomeration which have required Acoustic Design Statements to be submitted. The majority of the proposed residential units were part of planning applications for large residential

developments under the Planning and Development (Large Scale Residential Development) Act, 2021 (approximately 2,050 residential units).

In making recommendations to the planning authority the Council has reviewed the strategic noise mapping for 2017 to establish the likely 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.

3.2.7 Protection

In relation to the investigation of potential Quiet Areas in the Limerick Agglomeration the Council has undertaken fixed monitoring at the principal park in the City, The People’s Park (**Figure 3.8**), and began monitoring at the Castletroy Greenway (**Figure 3.9**) in January 2023.



Figure 3.8. Sound pressure level monitoring at The People’s Park.



Figure 3.9. Sound pressure level monitoring at the Castletroy Greenway.

The results of the monitoring at The People’s Park and Castletroy Greenway are given in **Tables 3.2** and **3.3**, respectively. In both tables the results of the Round 4 strategic noise mapping are shown.

Table 3.2. Results of the monitoring at The People’s Park.

Year	Monitoring Results					Strategic Noise Mapping 2021	
	L _{Aeq, 16hr} , dB	L _{den} , dB	L _{day} , dB	L _{evening} , dB	L _{night} , dB	L _{den} , dB	L _{night} , dB
2019	56.7	58.2	58.6	51.5	48.4		
2020	56.6	58.0	57.4	52.8	49.0		
2021	56.5	59.2	57.3	52.3	51.6	<55	<50
2022	56.1	57.4	56.9	51.9	48.3		
2023	55.7	57.8	56.5	51.8	49.6		

Table 3.3. Results of the monitoring at Castletroy Greenway.

Year	Monitoring Results					Strategic Noise Mapping 2021	
	L _{Aeq, 16hr} , dB	L _{den} , dB	L _{day} , dB	L _{evening} , dB	L _{night} , dB	L _{den} , dB	L _{night} , dB
2023	55.2	55.6	56.1	49.6	45.1	<55	<50

There has been the construction of a residential development adjacent to the monitor along the Castletroy Greenway during 2023 that has negatively influenced the day-time measurement (L_{day}). The daytime and evening-time measurements over the period of the Round 4 NAP (2024-2028) are expected to be less than the measurements for 2023.

The measured L_{den} at The People’s Park is higher than expected from the results of the strategic noise mapping and is above the traditional threshold of 55 dB L_{den} that was used in Ireland for previous rounds of noise action planning.

The sound being measured at The People’s Park is not road traffic noise alone, it is a combination of all sound (e.g. natural sounds, people using the park, maintenance, road noise etc.). Consequently, the Council has explored another method of investigating tranquil places, a qualitative method, with a view to collecting evidence for the designation of Quiet Areas based on the perceived responses of citizens in Limerick.

The EEA recommends that instead of identifying areas with low environmental noise we should be searching for calm⁵⁶. Many studies have reported the positive effects of natural sounds on the health and well-being of humans⁵⁷ 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 approach⁵⁸, 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 webinar⁵⁹ for Limerick citizens in collaboration with Dr. Antonella Radicchi, creator of the Hush City participatory framework and Hush City web application^{60,61,62}. 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 (listening walks) for citizens led by a moderator.

Over the period of the Round 3 NAP (2018-2023) the Council has hosted several soundwalks in the City for the public along the Three Bridges Walk and at The People's Park for the investigation of quiet areas in Limerick (**Figure 3.10**).

⁵⁶European Environment Agency: *Good practice guide on quiet areas*. EEA Tech. Report, No. 4, 2014.

⁵⁷E. Ratcliffe, "Sound and soundscape in restorative natural environments: A narrative literature review", *Frontiers in Psychology*, Vol. 12, pp. 1-7, 2021.

⁵⁸International Organization for Standardization, *Technical Specification ISO/TS 12913-1: Acoustics – Soundscape – Part 1: Definition and conceptual framework*, 2014.

⁵⁹<https://www.youtube.com/watch?v=syah7YnusPE&t=1404s> [Accessed March 2024]

⁶⁰A. 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.

⁶¹P. 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.

⁶²A. 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 3.10. Example of participants assessing the soundscape during a soundwalk in Limerick City along the Three Bridges Walk.

3.3 Clare County Council

Under Round 3 of the NAP the administrative area of Clare County Council was covered by one NAP and was concerned with major roads in County Clare.

3.3.1 Mitigation

The following is a list of mitigation measures undertaken:

Prioritisation of Areas using Decision Support Matrix

The prioritisation decision support matrix assessment outlined in the EPA Guidance (2009) was used to identify possible areas for assessment. One Hotspot was identified based on expected excessive road noise in the Westbury area. Due to lack of a budget and resources an assessment and monitoring was not undertaken.

Reducing Traffic Density

The reduction of traffic density, which in turn potentially reduces road noise, has been supported by Clare County Council with the promotion of public transport, the NTAs active travel programme and the promotion of cycling in the county.

The R463 Athlunkard to Ardnacrusha Cycle Scheme design is being progressed by Clare County Council in conjunction with the NTA as part of the Active Travel programme. Clare County Council has also worked in conjunction with the NTA with the development of the Athlunkard to Ardnacrusha Bus Corridor.

Further measures such as the implementing improvements to traffic management, smoothing traffic flows and the use of low noise emitting wearing courses such as Clause 942 SMA have been implemented. Shannon Municipal District's Schedule of Works includes a significant amount of road restoration improvement works. Clause 942 SMA is the predominant material used as a wearing course within speed restricted areas and in recent years on regional road network in Shannon Municipal District and in particular in speed restricted zones. Considerable sections of the R463 Ardnacrusha to Athlunkard has been resurfaced with Clause 942 as the wearing course. Road noise produced from this pavement is less than that generated from a surface dressing or HRA wearing course where traffic speeds are above 30 km/hr. Traffic calming and cycling facilities have been installed across the county. A benefit of these projects is to reduce speed and to support modal shifts which results in traffic reduction.

3.3.2 Prevention

The Road Design Office reviewed planning applications in relation to noise exposure from public roads using the Round 3 strategic noise maps. Applicants were requested to submit Noise Assessment Reports where it was considered necessary.

The Clare County Development Plan 2023- 2029 has due regard to the Round 3 NAP 2018-2023 and subsequent plans. The following is an objective in the Clare County Development Plan 2023- 2029:

"CDP 11.40 - It is an objective of Clare County Council to promote the proactive management of noise where it is likely to have a significant adverse effect on health and the environment; and

To ensure that all proposals for developments with regard to transportation infrastructure shall comply with the provisions of the Clare Noise Action Plan 2108 and any subsequent plans."

3.3.3 Monitoring

Noise monitoring was not carried out due to a lack of resources and budget. However, the R463 was identified as requiring noise monitoring based on an assessment using the decision support matrix in the EPA Guidance (2009).

3.3.4 Consultative Measures

Clare County Council has consulted and liaised with other relevant authorities such as TII, NTA and Planning Authorities in relation to noise reduction from major roads.

4 Summary of the Results of the Noise Mapping Process

4.1 CNOSSOS-EU:2020

The European Commission (EC) Directive 2015/996⁶³ established common noise assessment methods meeting the requirements of the END. It replaced Annex II of the END, removing the Interim Methods and 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 CNOSSOS-EU has since been transposed into Irish Law via the Environmental Noise (Amendment) Regulations 2021 and has been used to produce the strategic noise maps and to calculate the noise exposure statistics and harmful effects (see **Section 4.3**) for roads, rail and industry, where applicable.

4.2 Model Calculation Scenarios

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

- 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 population exposure statistics and harmful effects (**Section 4.3**).

4.3 Agglomeration Noise Exposure and Harmful Effects

4.3.1 Noise Exposure Assessment

The change in computational methodology between the first three rounds of strategic noise mapping and Round 4 (using CNOSSOS-EU) makes a direct comparison of the Round 4 noise exposure statistics with the previous three rounds methodologically complex and inaccurate.

In addition this is the first round of strategic noise mapping and noise action planning for the Limerick Agglomeration i.e. all roads, rail and major industry were not considered under the previous three rounds so a direct comparison of noise exposure cannot be undertaken

The Round 4 noise exposure statistics for the Limerick Agglomeration are presented in the following section, and at individual local authority level for Limerick City and County Council and Clare County Council in **Appendix C**.

⁶³ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0996&from=PT> [Accessed March 2024]

The tables in this section (**Tables 4.1 to 4.6**) summarise the population exposure statistics for the noise metrics and across the noise exposure bands defined in the Environmental Noise Regulations. The exposure statistics have been rounded to the nearest 100 persons as required by the regulations of 2018.

Table 4.1. Limerick Agglomeration - number of people in dwellings – L_{den}.

Noise Exposure (dB L _{den})	All Roads	All Railway	All Industry
55-59	24,500	800	0
60-64	13,100	700	0
65-69	4,700	100	0
70-74	600	0	0
>=75	0	0	0

**exposure statistics rounded to the nearest 100.*

Table 4.2. Limerick Agglomeration - number of people in dwellings – L_{night}.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	10,000	400	0
55-59	800	100	0
60-64	400	100	0
65-69	100	0	0
>=70	0	0	0

**exposure statistics rounded to the nearest 100.*

Table 4.3. Limerick Agglomeration - percentage of total population exposed to the noise source - L_{den} .

Noise Exposure (dB L_{den})	All Roads	All Railway	All Industry
55-59	24 %	1 %	0 %
60-64	13 %	1 %	0 %
65-69	5 %	0 %	0 %
70-74	1 %	0 %	0 %
≥ 75	0 %	0 %	0 %

Table 4.4. Limerick Agglomeration - percentage of total population exposed to the noise source - L_{night} .

Noise Exposure (dB L_{night})	All Roads	All Railway	All Industry
50-54	10 %	0 %	0 %
55-59	1 %	0 %	0 %
60-64	0 %	0 %	0 %
65-69	0 %	0 %	0 %
≥ 70	0 %	0 %	0 %

Table 4.5. Limerick Agglomeration - number of school buildings (and hospital buildings) – maximum L_{den} value at most exposed façade.

Noise Exposure (dB L_{den})	All Roads	All Railway	All Industry
55-59	38 (01)	00 (01)	00 (00)
60-64	19 (03)	03 (03)	00 (00)
65-69	10 (01)	00 (00)	00 (00)
70-74	00 (00)	00 (01)	00 (00)
≥ 75	00 (00)	00 (00)	00 (00)

Table 4.6. Limerick Agglomeration - number of school buildings (and hospital buildings) – maximum L_{night} value at most exposed façade.

Noise Exposure (dB L_{night})	All Roads	All Railway	All Industry
50-54	15 (02)	02 (02)	00 (00)
55-59	00 (00)	00 (01)	00 (00)
60-64	00 (00)	00 (01)	00 (00)
65-69	00 (00)	00 (00)	00 (00)
≥ 70	00 (00)	00 (00)	00 (00)

The noise sensitive buildings identified in **Table 4.5** and **Table 4.6** are presented in **Appendix D**, and the maximum L_{den} and L_{night} values at the most exposed façade are given.

4.3.2 Harmful Effects Assessment

The Environmental Noise (Amendment) Regulations 2021 set out the assessment methods for harmful effects, which considers ischaemic heart disease (IHD), high annoyance (HA) and high sleep disturbance (HSD).

Ischaemic heart disease is required to be calculated for road traffic noise only, whereas high annoyance and high sleep disturbance are calculated for road traffic, railway and aircraft noise.

The harmful effects assessment has been undertaken independently for each source. Where the same people are simultaneously exposed to different noise sources, the harmful effects may not, in general, be cumulated, however can be compared to identify proportional significance.

The method determines harmful effects on the population within an assessment area, rather than an accurate assessment of possible health effects at any specific building or location.

Whilst the regulations set out the equations to be used for calculating harmful effects, it does not define noise thresholds above which health effects should be calculated, nor does it stipulate the assessment bands that should be used (0.1 dB, 1 dB or 5 dB), these have been provided by the EPA, and are as follows:

- The calculations for harmful effects should be undertaken in 1 dB assessment bands
- The assessment of harmful effects should be undertaken above the following thresholds:
 - **Road traffic noise:** 53 dB L_{den} , 45 dB L_{night} ;
 - **Railway noise:** 54 dB L_{den} , 44 dB L_{night} .

Table 4.7 presents the calculated harmful effects in the case of road traffic noise for the Agglomeration, and **Table 4.8** presents the calculated harmful effects railway noise.

Table 4.7. Limerick Agglomeration - health effects (road noise).

Harmful Effect	Number of People		% of Population*	
	All Sources	Major Sources	All Sources	Major Sources
Ischaemic Heart Disease	7.12	3.71	0.01%	0.00%
Highly Annoyed	7,916.33	4,331.43	7.84%	4.29%
Highly Sleep Disturbed	1,386.82	1,022.23	1.37%	1.01%

*Total population for Limerick agglomeration = 101,028.86

Table 4.8. Limerick Agglomeration - harmful effects (railway noise).

Harmful Effect	Number of People		% of Population*	
	All Sources	Major Sources	All Sources	Major Sources
Highly Annoyed	312.39	N/A	0.31%	N/A
Highly Sleep Disturbed	115.58	N/A	0.11%	N/A

*Total population for Limerick agglomeration = 101,028.86

It is important to note that the numbers presented do not represent the actual number of people suffering from harmful health effects but are calculated numbers based on the equations set out in the Environmental Noise (Amendment) Regulations 2021.

4.3.3 Strategic Noise Mapping Figures

The strategic noise maps are consistent with the requirements of the EPA Guidance and EEA Reportnet⁶⁴, the mechanism by which the noise mapping results are issued to the European Commission.

The strategic noise maps are noise contour maps, 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 impermissible in relation to environmental noise, however, do set the noise exposure bands to be reported, which are reflected

⁶⁴ <https://www.eionet.europa.eu/reportnet/about-reportnet-1>

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 is. Conversely, the closer the calculated noise is to the lowest noise exposure band the more desirable it may be.

The strategic noise maps are shown in the following figures for the two noise indicators specified in the Regulations, L_{den} and L_{night} .

- **Figure 4.1.** Limerick Agglomeration – Strategic Noise Map – L_{den} – Road Traffic.
- **Figure 4.2** Limerick Agglomeration – Strategic Noise Map – L_{night} – Road Traffic.
- **Figure 4.3.** Limerick Agglomeration – Strategic Noise Map – L_{den} – Railway Traffic.
- **Figure 4.4.** Limerick Agglomeration – Strategic Noise Map – L_{night} – Railway Traffic.
- **Figure 4.5.** Limerick Agglomeration – Strategic Noise Map – L_{den} – Industry.
- **Figure 4.6.** Limerick Agglomeration – Strategic Noise Map – L_{night} – Industry.

4.4 Key Insights from Strategic Noise Mapping

This section outlines the key insights from the results of the Round 4 strategic noise mapping. It should be noted that the insights are based on the results of the strategic noise maps, rather than measurements.

4.4.1 Population Exposure to Noise

The most prevalent source of environmental noise within the Limerick Agglomeration is road traffic, where (rounded to the nearest 100) there is a total of 42,900 people in dwellings exposed to road traffic noise greater than, or equal to, 55 dB L_{den} (in comparison to 1,600 people from railway sources and 0 from industry sources⁶⁵). This trend is also reflected for the total population exposed to night-time levels of environmental noise greater than, or equal to, 50 dB L_{night} .

The percentage of total population in dwellings within the Agglomeration that are exposed to noise levels greater than, or equal to, 55 dB L_{den} from each source are:

- 42% for road traffic source;
- 2% for railway sources;
- 0% for industrial sources.

⁶⁵ For industry noise without rounding to the nearest 100 the total number of people exposed is:

- 13 people exposed to noise levels of 55 dB L_{den} or greater; and
- 10 people exposed to noise levels of 50 dB L_{night} or greater.

The location of the dwellings exposed to 55 dB L_{den} or greater and 50 dB L_{night} or greater is presented in **Appendix E**.

The percentage of the total population in dwellings within the Limerick agglomeration that are exposed to noise levels noise greater than, or equal to, 50 dB L_{night} from each source are:

- 11% for road traffic source;
- 1% for railway sources;
- 0% for industrial sources.

It is reported above that, when rounded to the nearest 100, there are no people living in dwellings who are expected to be exposed to levels equal to or exceeding the highest noise band (greater than, or equal to 75 dB L_{den} and greater than, or equal to 70 dB L_{night}) for road traffic, railway or industry sources based on the strategic noise mapping⁶⁶.

4.4.2 Harmful Effects

The predicted number of people Highly Annoyed indicates that more people are at risk of high annoyance from road traffic noise (7,916.33 people) than from railway sources (312.39 people). This equates to 7.84% of the population at risk of high annoyance from road traffic noise and 0.31% of the population at risk of high annoyance from railway noise.

The calculation of number of people Highly Sleep Disturbed indicates that more people are at risk of high sleep disturbance from road traffic noise (1,386.82 people) than from railway sources (115.58 people). This equates to 1.37% of the population at risk of high sleep disturbance from road traffic noise and 0.11% of the population at risk of high sleep disturbance from railway noise.

The number of people at risk from Ischemic Heart Disease is only calculated for road traffic noise, therefore a comparison with railway noise cannot be made directly. However, the percentage of population at risk of each harmful effect indicates that:

- High Annoyance is the most prevalent harmful effect from both road traffic and railway sources;
- The impact of traffic-related noise from major roads on the population causing ischaemic heart disease is considered to be very low.

⁶⁶ For road traffic noise without rounding to the nearest 100 the total number of people exposed is:

- 45 people exposed to noise levels of 75 dB L_{den} or greater; and
- 0 people exposed to noise levels of 70 dB L_{night} or greater.

The results of the mapping without rounding to the nearest 100, has indicated that there are no people living in dwellings who are expected to be exposed to railway or industry noise levels equal to or exceeding the highest noise band (greater than, or equal to 75 dB L_{den} and greater than, or equal to 70 dB L_{night}).

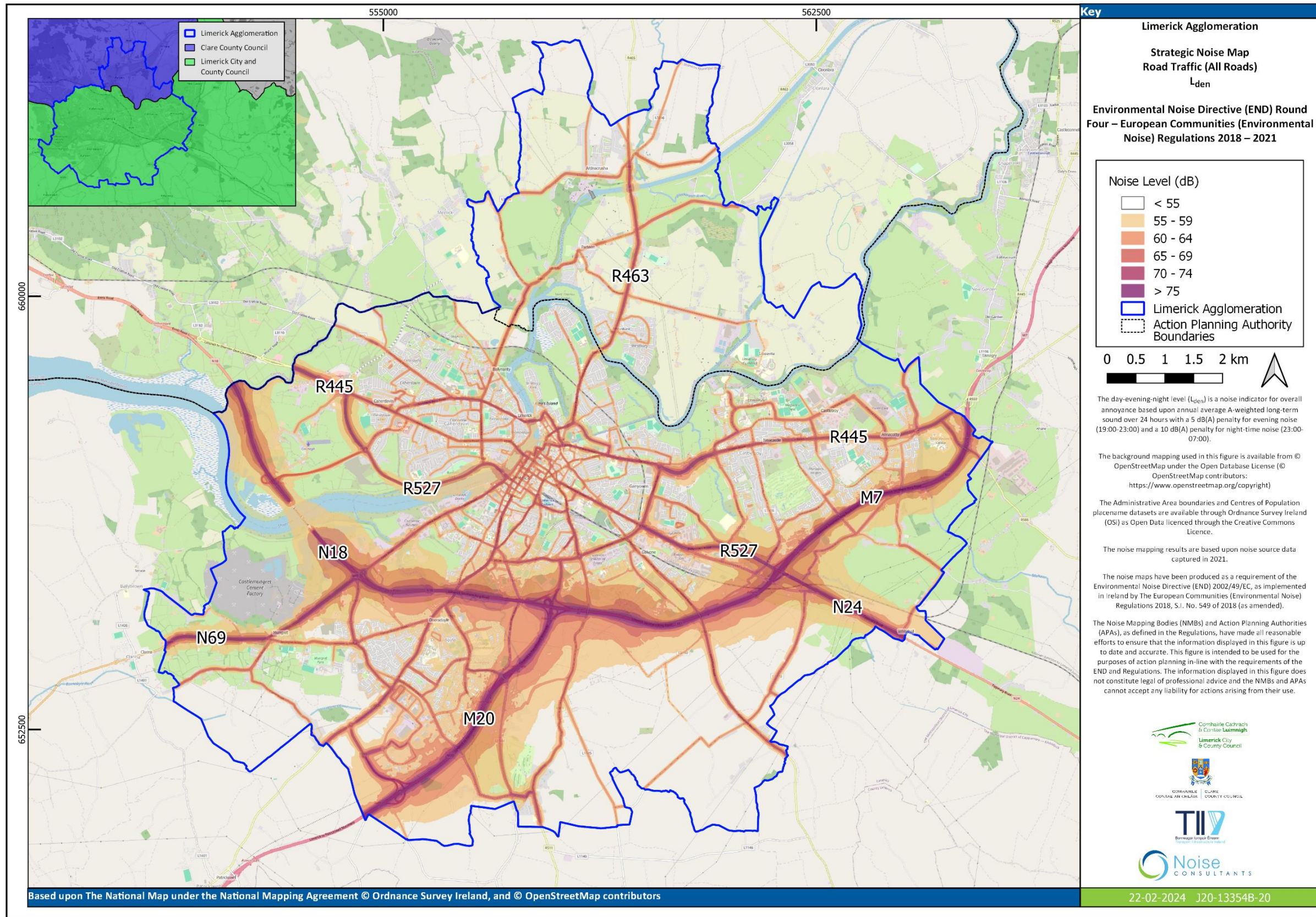


Figure 4.1. Limerick Agglomeration – strategic noise map – L_{den} – road traffic.

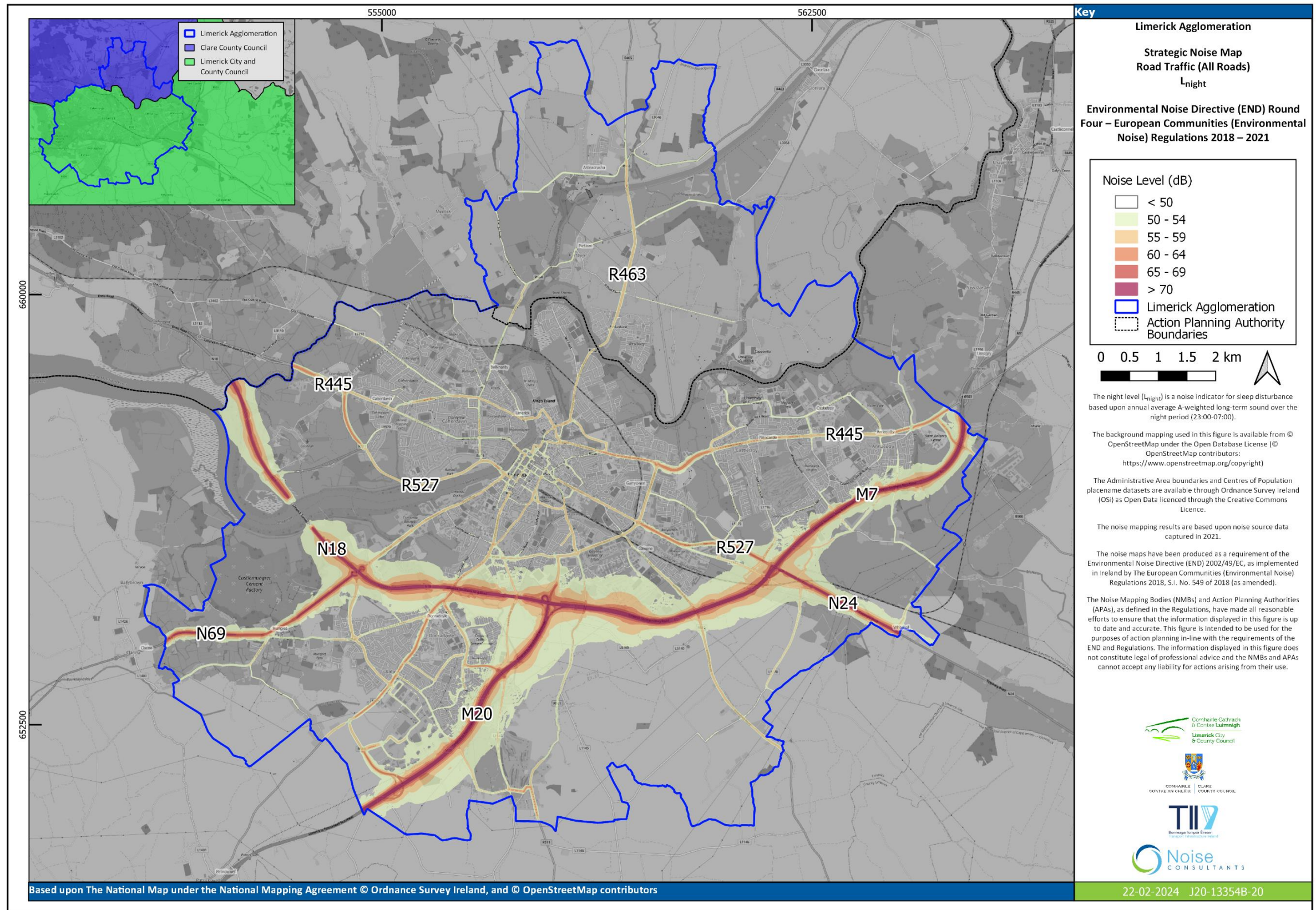


Figure 4.2 Limerick Agglomeration – strategic noise map – L_{night} – road traffic.

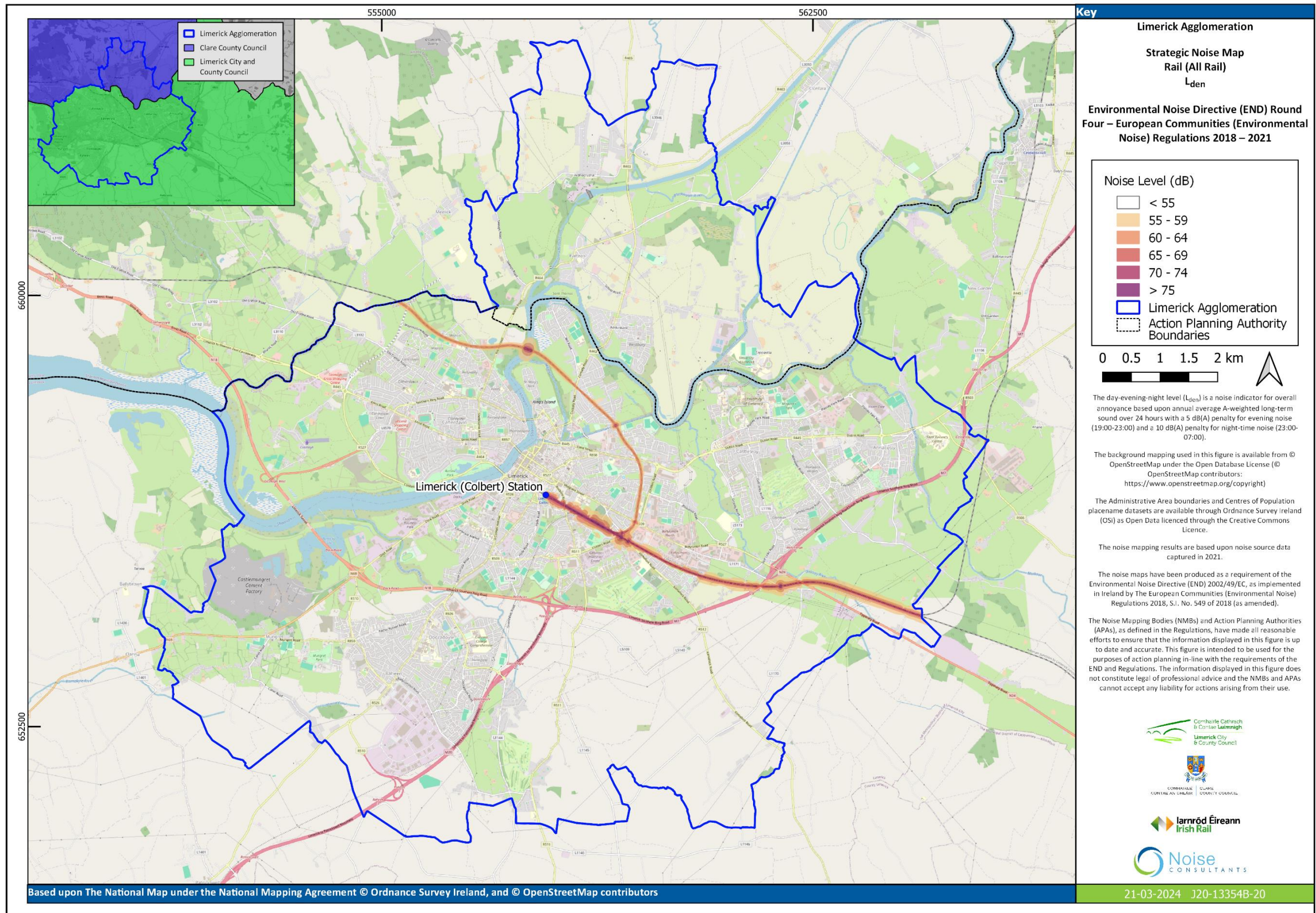


Figure 4.3. Limerick Agglomeration – strategic noise map – L_{den} – railway traffic.

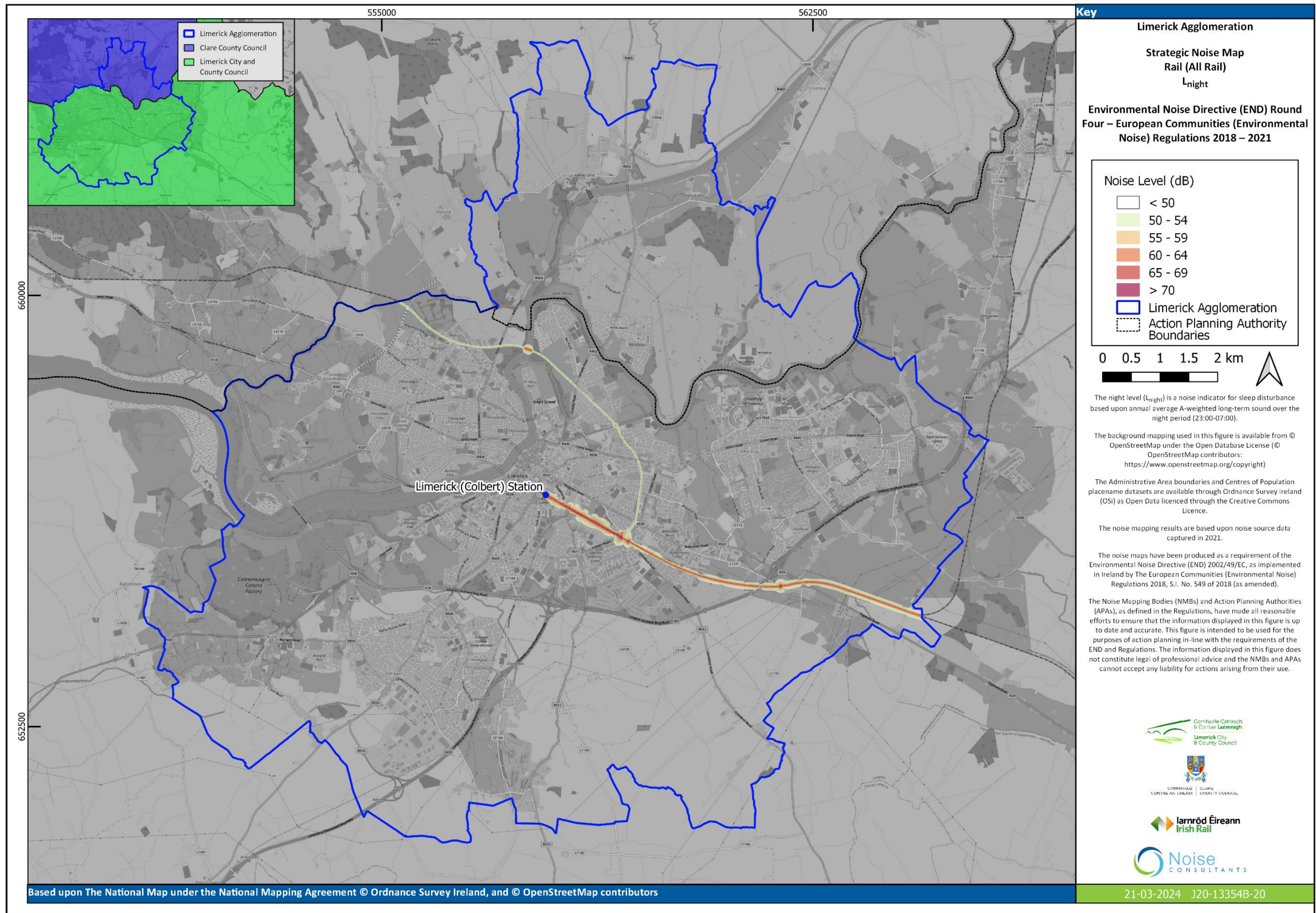


Figure 4.4. Limerick Agglomeration – strategic noise map – L_{night} – railway traffic.

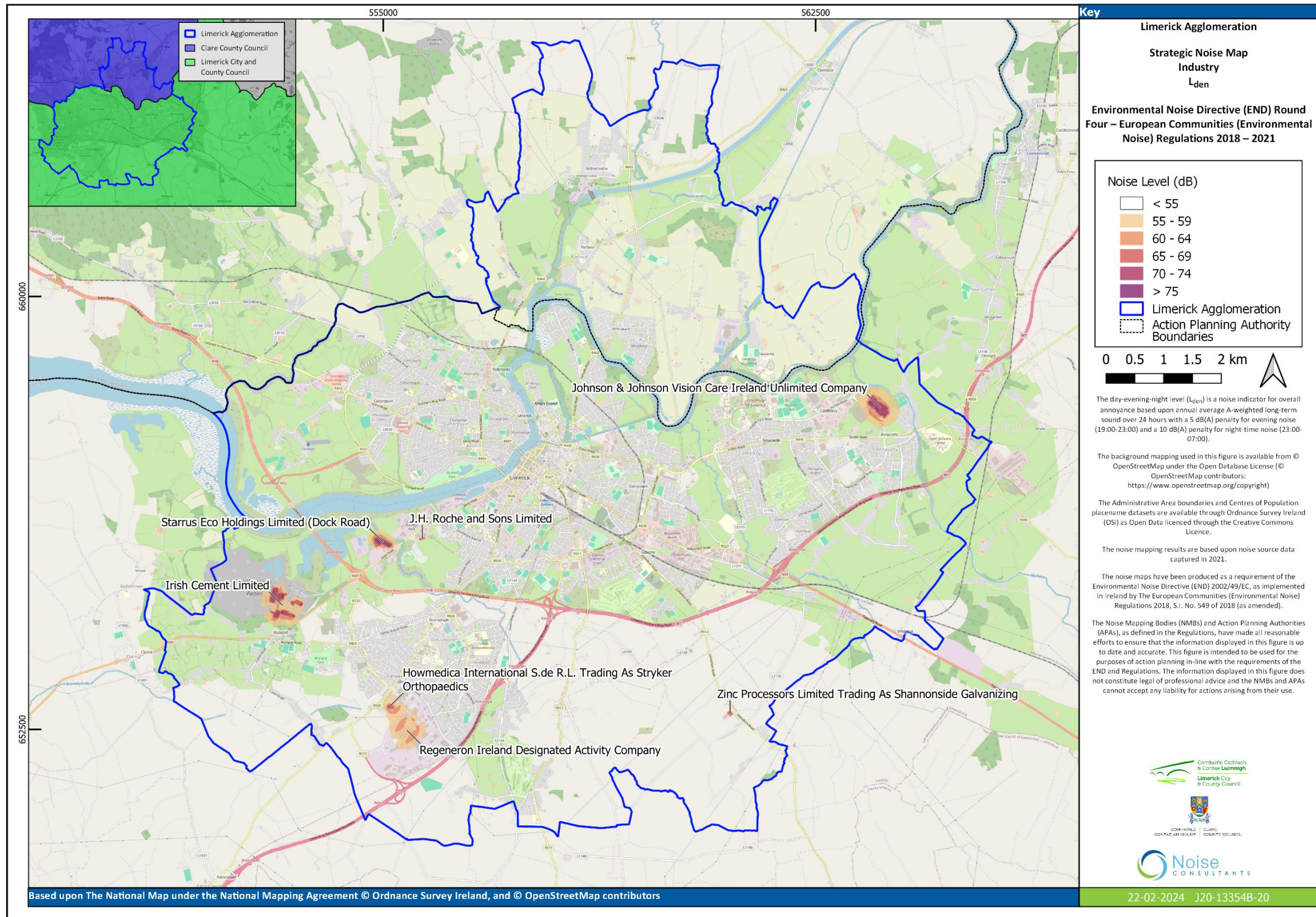


Figure 4.5. Limerick Agglomeration – strategic noise map – L_{den} – industry.

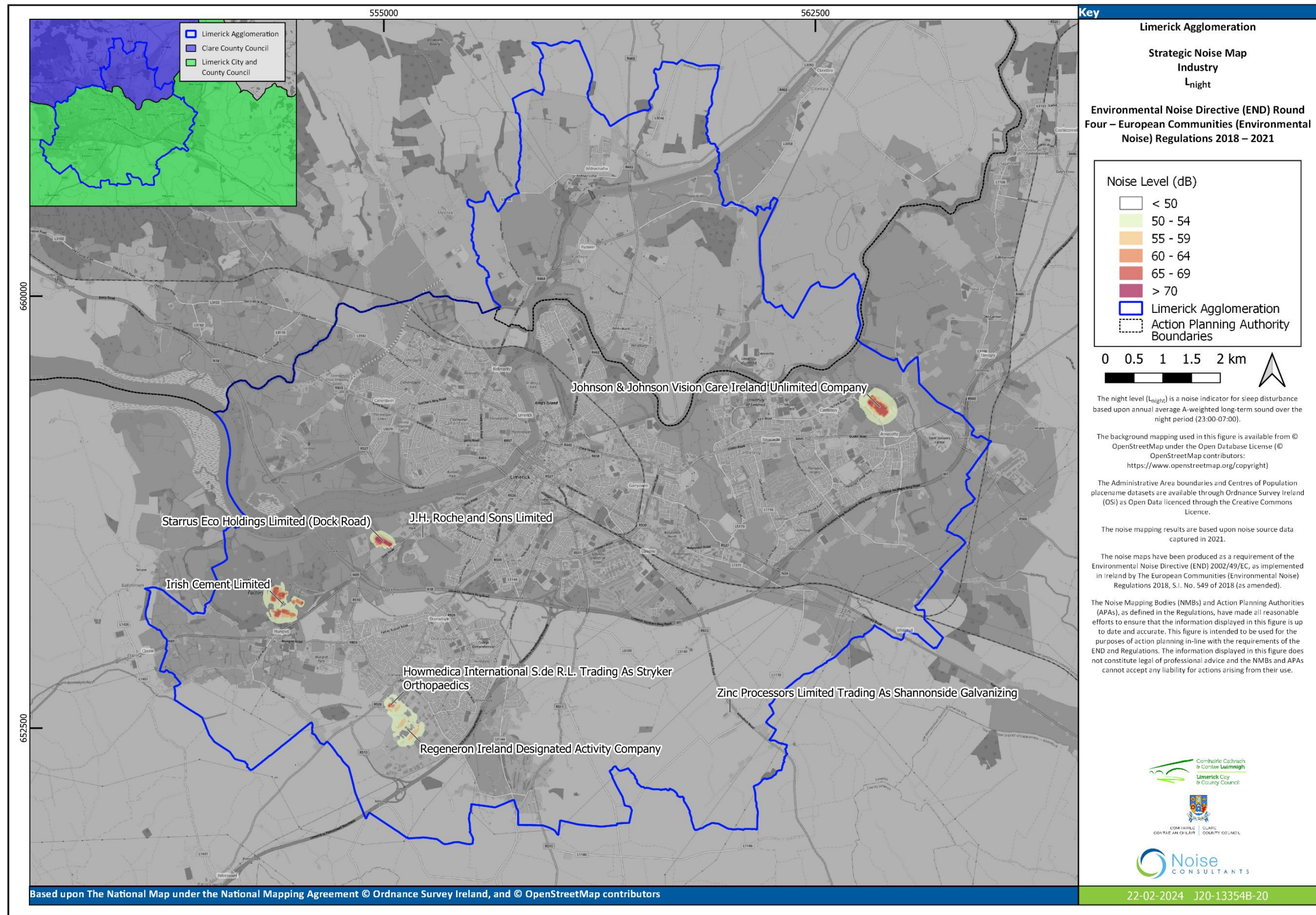


Figure 4.6. Limerick Agglomeration – strategic noise map – L_{night} – industry.

5 Approach to Identification of Areas to be Subject to Noise Management Activities

5.1 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 IAs where the health effects are highest, determined through a consideration 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, through a prioritisation process, as those which will be evaluated and addressed during the implementation of the NAP.

5.2 Scope

The recommended approach above has been used for the Limerick Agglomeration with respect to noise from roads and railways.

The EPA holds the authority to grant licenses for specified industrial establishments in accordance with the IED/IPPC Regulations. In cases where strategic noise mapping reveals a potential need for a noise reduction from industrial areas then the Action Planning Authorities are advised to collaborate with the EPA Office of Environmental Enforcement concerning existing license conditions and the facility's noise management strategies.

5.3 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, as set out in the EPA Guidance.

The process of identifying IAs within the Agglomeration involves using the results of the strategic noise mapping to identify the noise sensitive residential buildings⁶⁷ 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* (ENG). This is followed by an automated process within Geographic Information System (GIS) software to identify the areas with the highest concentrations of people highly annoyed, referred to as the MIAs⁶⁸. 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.

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 PIAs.

5.4 Important Areas (IAs)

A summary of the number of people in the Limerick Agglomeration which experience environmental noise above the guideline levels in the Environmental Noise Guidelines is summarised in **Table 5.1**.

Table 5.1. Important Areas - number of people in dwellings.

Noise Source	Guideline Level	Number of People in Dwellings Exposed to Levels Above Guideline Level
Road Traffic	53 dB L_{den}	54,412
	45 dB L_{night}	33,882
Railway	54 dB L_{den}	1,789
	44 dB L_{night}	1,912

⁶⁷ The assignment of population to the calculated noise levels is set out within Annex II of the END (CNOSSOS-EU).

⁶⁸ The EPA Guidance sets a density criterion of 15 or more people per 100m² as being the most appropriate for MIAs in main urban areas, with lower criteria of 10 and 7.5 people per 100m² appropriate on the edge of urban or in rural areas.

5.5 Most Important Areas (MIAs)

A summary of the MIAs identified within the Limerick Agglomeration using the EPA Guidance density criterion of 15 or more people highly annoyed per 100m², for the urban area, and 7.5 or more people highly annoyed per 100m²⁽⁶⁹⁾ is given in **Table 5.2** and presented in **Figure 5.1**.

Table 5.2. Limerick Agglomeration – Most Important Areas (MIAs) summary.

Action Planning Authority	No. of MIAs			No of People			
	All Sources	Road	Rail	Total Population	HA	HSD	IHD
LCCC	18	18	0	5,945	1,014	218	1
CCC	0	0	0	0	0	0	0
Agglomeration	18	18	0	5,945	1,014	218	1

Numbers rounded to the nearest whole number

Using the EPA Guidance criterion above 18 MIAs were identified within the administrative area of Limerick City and County Council, with no MIAs identified within the administrative area of Clare County Council.

5.6 Priority Important Areas (PIAs)

A process has been undertaken to identify which MIAs should be considered a priority (PIAs), with a commitment to undertake an assessment of noise mitigation measures within the life cycle of the NAP. The PIAs selected by Limerick City and County Council are summarised in **Table 5.3** and **Table 5.4**, and are also presented in **Figure 5.2**, and were selected by Limerick City and County Council based upon those MIAs or groups of MIAs with the highest concentration of people expected to be harmfully effected. No PIAs have been identified by Clare County Council because there were no MIAs within the administrative area.

More localised figures presenting the PIAs and corresponding statistics for the Limerick Agglomeration are presented in **Appendix E**.

⁶⁹ A density criterion of 7.5 or more people highly annoyed per 100m² was used to identify the area known as the Monaleen Hotspot in the Limerick Noise Action Plan 2018-2023 and which is being carried forward for the Limerick Agglomeration NAP 2024-2028.

Table 5.3. Limerick Agglomeration – Priority Important Area (PIA) summary - Part 1.

PIA	Source	MIA Criterion (People HA per 100m ²)	Area (m ²)	Total Population*	Harmful Effects Statistics**			Number of People Above IA Guideline Level***			
					HA	HSD	IHD	Road 53dB L _{den}	Road 45dB L _{night}	Railway 54dB L _{den}	Railway 44dB L _{night}
LCCC_1 (Limerick City)	Road	15	229,100	4,157	744	135	1	3,601.65	3,036.15	-	-
LCCC_2 (John Carew Park)	Road	15	30,200	353	54	17	0	297.99	352.77	-	-
LCCC_3 (Ballycummin)	Road	15	19,000	254	37	11	0	248.15	253.71	-	-
LCCC_4 (Monaleen / Castletroy)	Road	7.5	165,500	1,181	179	55	0	1,067.33	1,110.97	-	-

* Total population inside all MIAs associated with the PIA

** The harmful effects presented in this table are determined from a statistical approach across the whole population covered by the noise maps, and should not be considered to be an accurate assessment of the possible health effects at any specific building

*** The total population inside all MIAs associated with the PIA Above the IA Guideline Level

Table 5.4. Limerick Agglomeration – Priority Important Area (PIA) summary - Part 2.

PIA	Source	MIA Criterion (People HA per 100m ²)	Area (m ²)	Total Population*	Harmful Effects Statistics**			Percentage Population***	Percentage Harmful Effects****		
					HA	HSD	IHD		HA	HSD	IHD
LCCC_1 (Limerick City)	Road	15	229,100	4,157	744	135	1	4.4%	9.7%	9.8%	12.6%
LCCC_2 (John Carew Park)	Road	15	30,200	353	54	17	0	0.4%	0.7%	1.2%	0.7%
LCCC_3 (Ballycummin)	Road	15	19,000	254	37	11	0	0.3%	0.5%	0.8%	0.4%
LCCC_04 (Monaleen / Castletroy)	Road	7.5	165,500	1,181	179	55	0	1.3%	2.3%	4.0%	2.5%

* Total population inside all MIAs associated with the PIA

** The harmful effects presented in this table are determined from a statistical approach across the whole population covered by the noise maps, and should not be considered to be an accurate assessment of the possible health effects at any specific building

*** Percentage of the total population inside all MIAs associated with the PIA from the total population in the APA

**** Percentage of the total harmful effect inside all MIAs associated with the PIA from the harmful effect of the APA

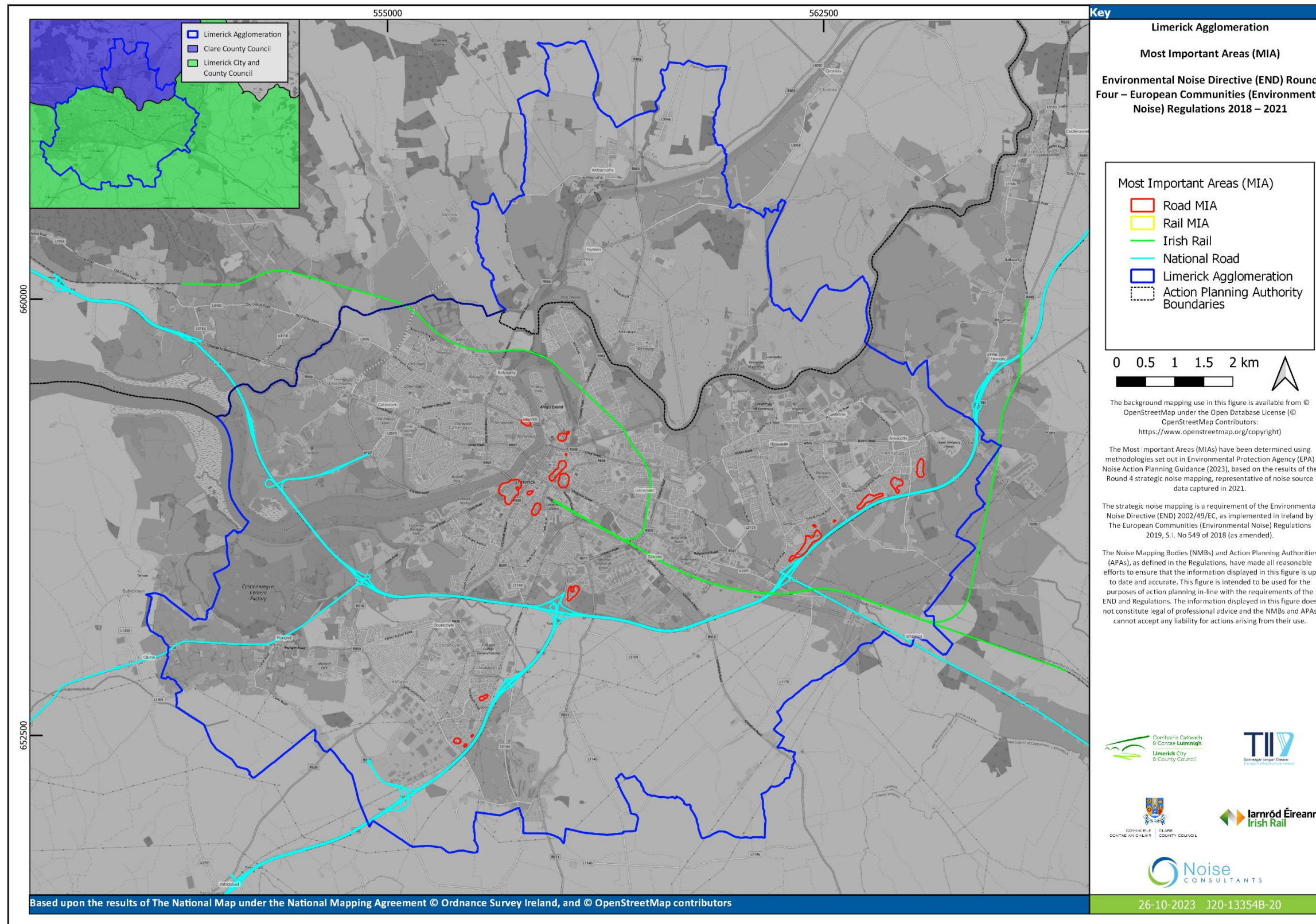


Figure 5.1. Limerick Agglomeration – Most Important Areas (MIAs).

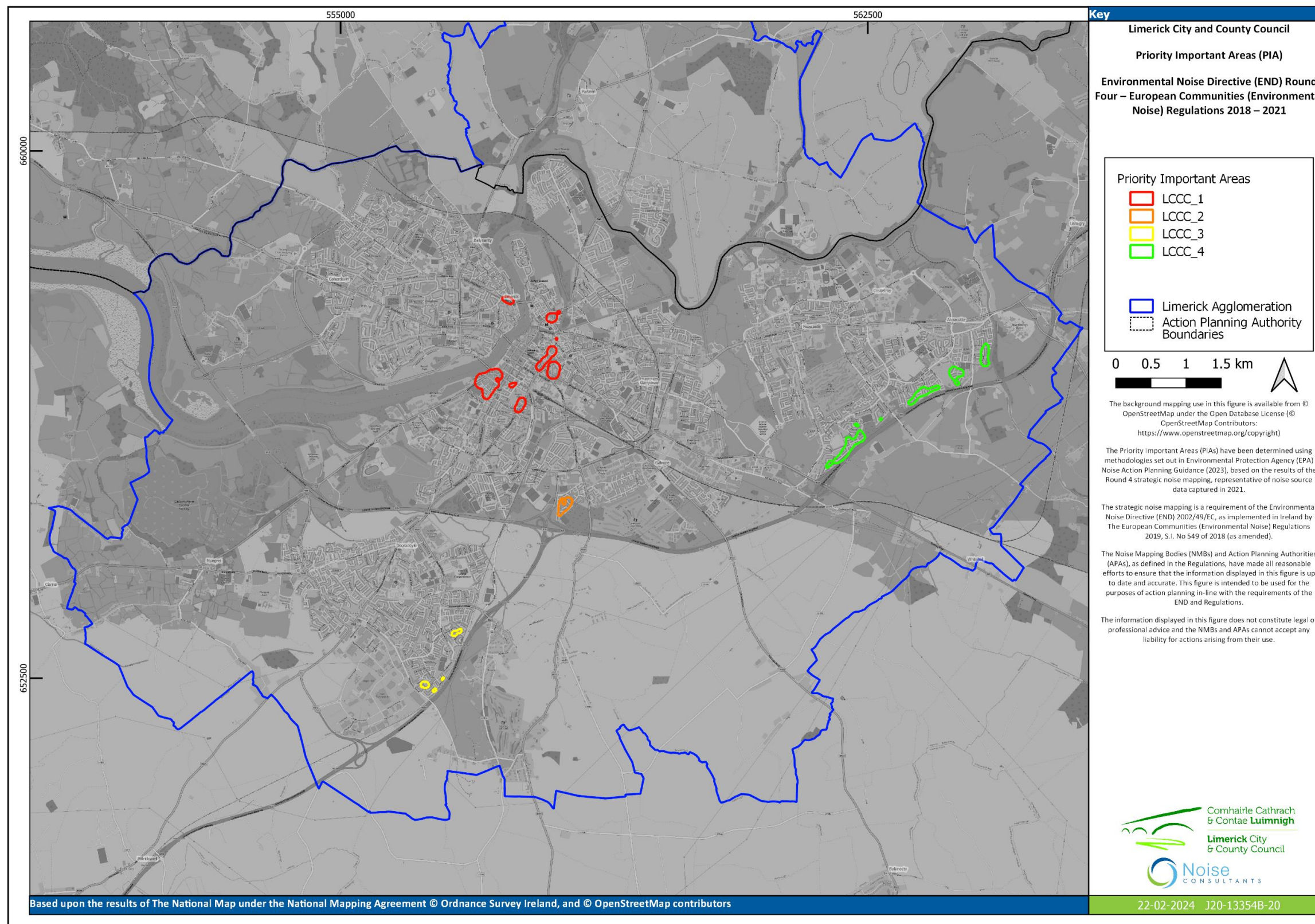


Figure 5.2. Limerick Agglomeration – Priority Important Areas (PIAs) - LCCC_1: Limerick City; LCCC_2: John Carew Park; LCCC_3: Ballycummin; LCCC_4: Monaleen/Castle Trooy.

6 Approach to Identification of Areas to be Preserved for Environmental Noise Quality

6.1 Regulatory Background

The Fourth Schedule of the Environmental Noise Regulations, 2018, requires Action Planning Authorities to set out actions in relation to measures to preserve Quiet Areas.

At present there is no universally accepted definition by EU Member States⁷⁰ of what constitutes a Quiet Area. However, they are regarded as areas where environmental noise levels are deemed to be low and therefore protection should be considered.

The process of delimiting an area as a 'Quiet Area' is informed by an investigation by the Action Planning Authority. For those areas where investigation outcomes identify a benefit of delimiting it as a Quiet Area, the evidence is put forward to the EPA for consideration in consultation with the Minister and successful applications resulting in a delimitation of the Quiet Area.

There are currently no Quiet Areas delimited within the Limerick Agglomeration. Limerick City and County Council and Clare County Council will consider the designation of 'Quiet Areas' during the life of the NAP, and will collect evidence to submit to the EPA for consideration in consultation with the Minister.

6.2 Overview of Process

The process of identifying Potential Candidate Quiet Areas and Candidate Quiet Areas is Stage 1 of a two-stage process using the results of the strategic noise mapping. Stage 1 is detailed below.

At Stage 2, Candidate Quiet Areas will be the subject of investigations by Limerick City and County Council and Clare County Council during the implementation of the NAP. The evidence captured from these investigations will be used to inform recommendations for areas to be delimited as Quiet Areas by the Minister.

6.3 Stage 1 - Potential Candidate Quiet Areas (PCQAs)

EU Member States have adopted several methods for defining Quiet Areas within agglomerations⁷¹, including, but not limited to:

- Noise related criteria, based on the results of the strategic noise mapping or measurements;

⁷⁰ European Parliament, Towards a comprehensive noise strategy, Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy, 2012

⁷¹ European Environment Agency, Good practice guide on quiet areas, EEA Technical report, No 4/ 2014

- Land-use;
- Local amenity value;
- Accessibility;
- User and visitor experience, including soundwalks; and
- Stakeholder engagement, including workshops.

The identification and evaluation of Quiet Areas in Ireland has been shaped by a national policy approach and EPA research in acknowledgement of the differing approaches in their identification across Member States.

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's 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 provides a list of primary and secondary public open spaces which could be considered as suitable 'green spaces' in the context of the identification of Quiet Areas. These public open spaces include: recreational areas, playing fields, playgrounds, public parks and gardens, beaches, nature reserves, cemeteries, riverbanks, canals, places of worship, hospitals, including nursing and convalescence homes, educational institutions, and childcare/crèche facilities. These green spaces are referred to as Potential Candidate Quiet Areas (PCQAs).

The identification of PCQAs in the Limerick Agglomeration has involved consideration of the following spatial data sources: Limerick City and County Council Parks Limerick City and Metropolitan Area dataset, National Land Cover Map for Ireland 2022⁷², OSi Prime2 data, Corine Land Cover and Land Use Data 2020, and the Urban Atlas 2018.

For the purpose of this NAP, Potential Candidate Quiet Areas are identified as publicly accessible green spaces within the Limerick Agglomeration with an area greater than 1 hectare, that are considered would potentially have a community benefit through Quiet Area delimitation. They are mainly parks and also green spaces in residential developments. A summary of the number of PCQAs identified meeting this criteria is set out in **Table 6.1**, and shown in **Figure 6.1**.

⁷² Available at: <https://www.epa.ie/our-services/monitoring--assessment/assessment/mapping/national-land-cover-map/> [Accessed March 2024]

Table 6.1. Number of Potential Candidate Quiet Areas.

Description	Limerick City and County Council	Clare County Council
No. of PCQAs	24	4

6.4 Stage 1 - Candidate Quiet Areas (CQAs)

The PCQAs summarised in **Table 6.1** have been evaluated further in accordance with the EPA Guidance to determine a shortlist of Candidate Quiet Areas (CQAs).

For the evaluation, a 10 metres grid model of the $L_{Aeq,16hr}$ noise metric has been used for all noise sources within the scope of the NAP (road traffic, rail traffic and industrial activity sites) in order to identify areas expected to have low environmental noise.

The evaluation of the model allows PCQAs to be described in the following three categories:

- **Absolute quiet areas:** where environmental noise levels are low (median noise level of a PCQA is less than 50 dB $L_{Aeq,16hr}$) and should be preserved;
- **Relatively quiet areas:** where environmental noise levels are relatively low in comparison to community noise exposures (25% of population within 1000m of a PCQA is expected to be exposed to noise 10 dB above the median noise level of the PCQA); and
- **Other quiet areas:** in cases where environmental noise levels, although expected to be low, do not meet either of the above CQA categories, but the PCQA is deemed by the Action Planning Authority as an area of high community value.

A summary of the PCQAs which meet the absolute, relative and other CQA criteria within the Limerick Agglomeration is presented in **Table 6.2**. The CQAs are also presented in **Figure 6.1**.

Table 6.2. Number of Candidate Quiet Areas (CQAs).

Description	LCCC	CCC	Total
Total PCQAs Considered	24	4	28
PCQA: Absolute CQA	7	3	10
PCQA: Relative CQA	1	0	2
PCQA: Other CQA	0	1	0
Total: CQA	8	1*	12

*CCC do not wish to further investigate the three PCQA which meet the Absolute CQA criteria (The Moorings, Version Crescent and Ballyglass)

An overview of the CQAs based on the strategic noise mapping for Limerick City and County Council and Clare County Council is presented in **Table 6.3** and **Table 6.4**, respectively. The Councils will investigate these CQAs during the implementation of the NAP to inform an understanding of the benefit of delimiting the CQAs as formal Quiet Areas (see **Section 7.3**).

Table 6.3. Limerick City and County Council: Overview of Candidate Quiet Areas (CQAs).

CQA ID	Name	Easting	Northing	Area (m ²)	Pop. within 1,000m	Noise Level, L _{Aeq} , 16hr, dB	Area of CQA below 45 dB L _{Aeq} , 16hr (m ²)	CQA Criteria
LCCC_6	Mungret Park	553912	653762	111108	4004	49	38	A
LCCC_10	Caherdavin Green	554874	658597	36865	7620	48	194	A
LCCC_14	Mayorstone Park	556248	658057	17627	11818	46	3049	A
LCCC_20	Castletroy Greenway	563040	657215	28676	7771	49	0	A
LCCC_22	Shannon Fields	558977	658712	103542	8225	43	85247	A
LCCC_5	People's Park	557517	656503	34040	14931	53	4021	R
LCCC_11	Borough Field	557918	655867	27265	13059	51	8	R
LCCC_25	The Red Path	558489	659383	18725	6761	43	12484	A

CQA Criteria: A – Absolute CQA, R – Relative CQA.

Table 6.4. Clare County Council: Overview of Candidate Quiet Areas (CQAs).

CQA ID	Name	Easting	Northing	Area (m ²)	Pop. within 1,000m	Noise Level, L _{Aeq} , 16hr, dB	Area of CQA below 45 dB L _{Aeq} , 16hr (m ²)	CQA Criteria
CCC_1	Shannon Banks	558693	659432	22709	6636	51	5481	#

CQA Criteria: # - APA requested CQA.

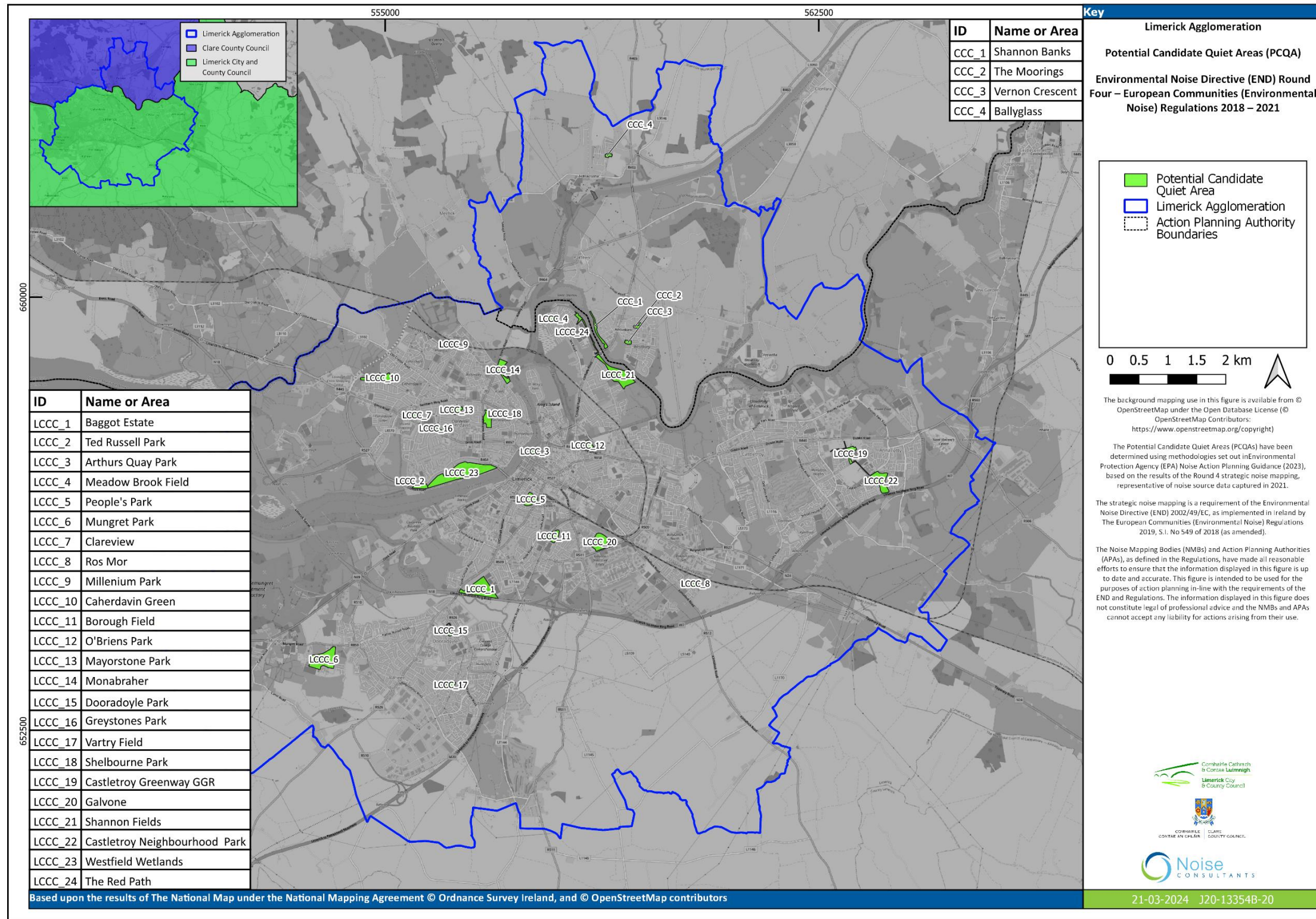


Figure 6.1. Limerick Agglomeration – Potential Candidate Quiet Areas (PCQAs).

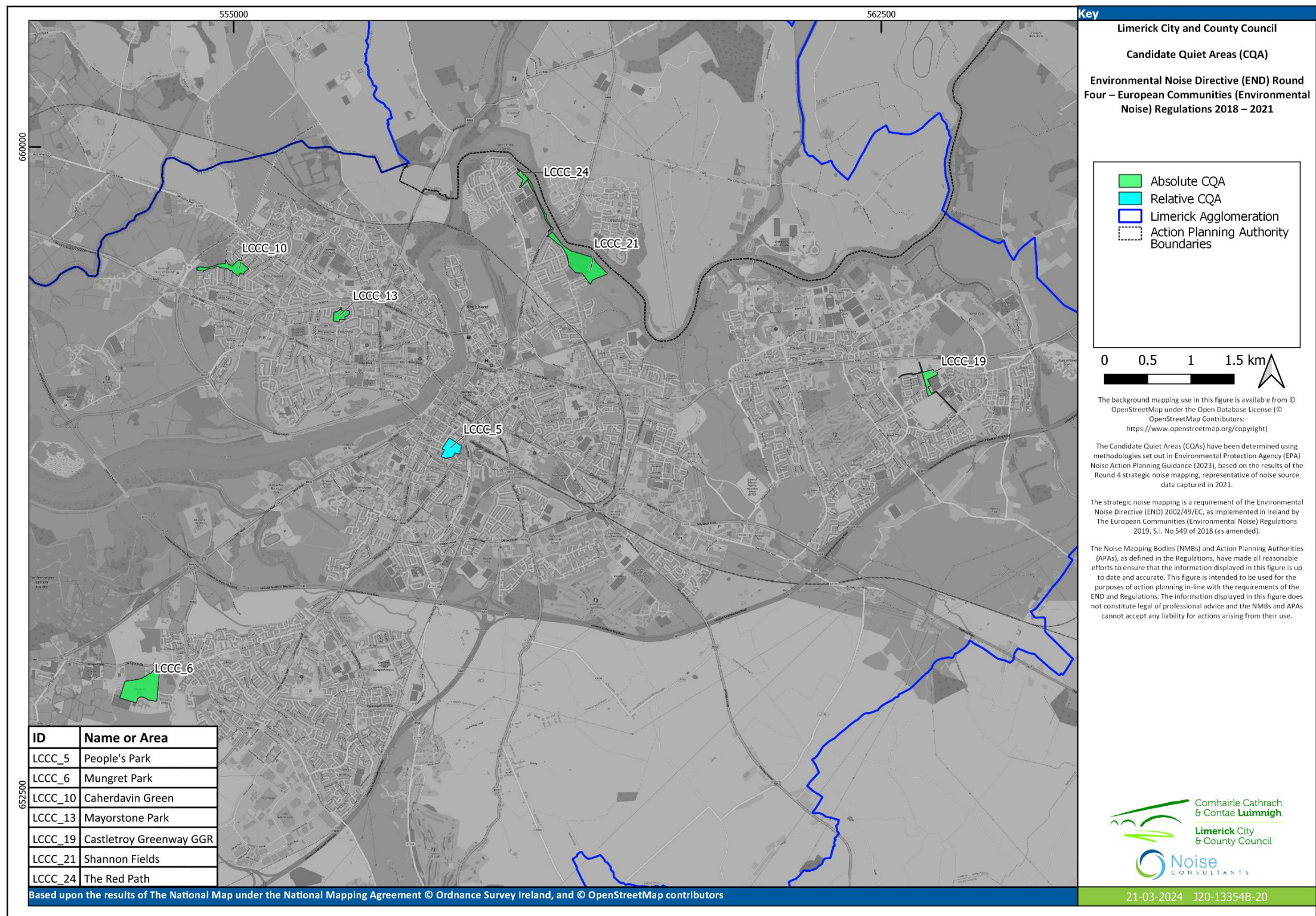


Figure 6.2. Limerick City and County Council: Candidate Quiet Areas (CQAs).

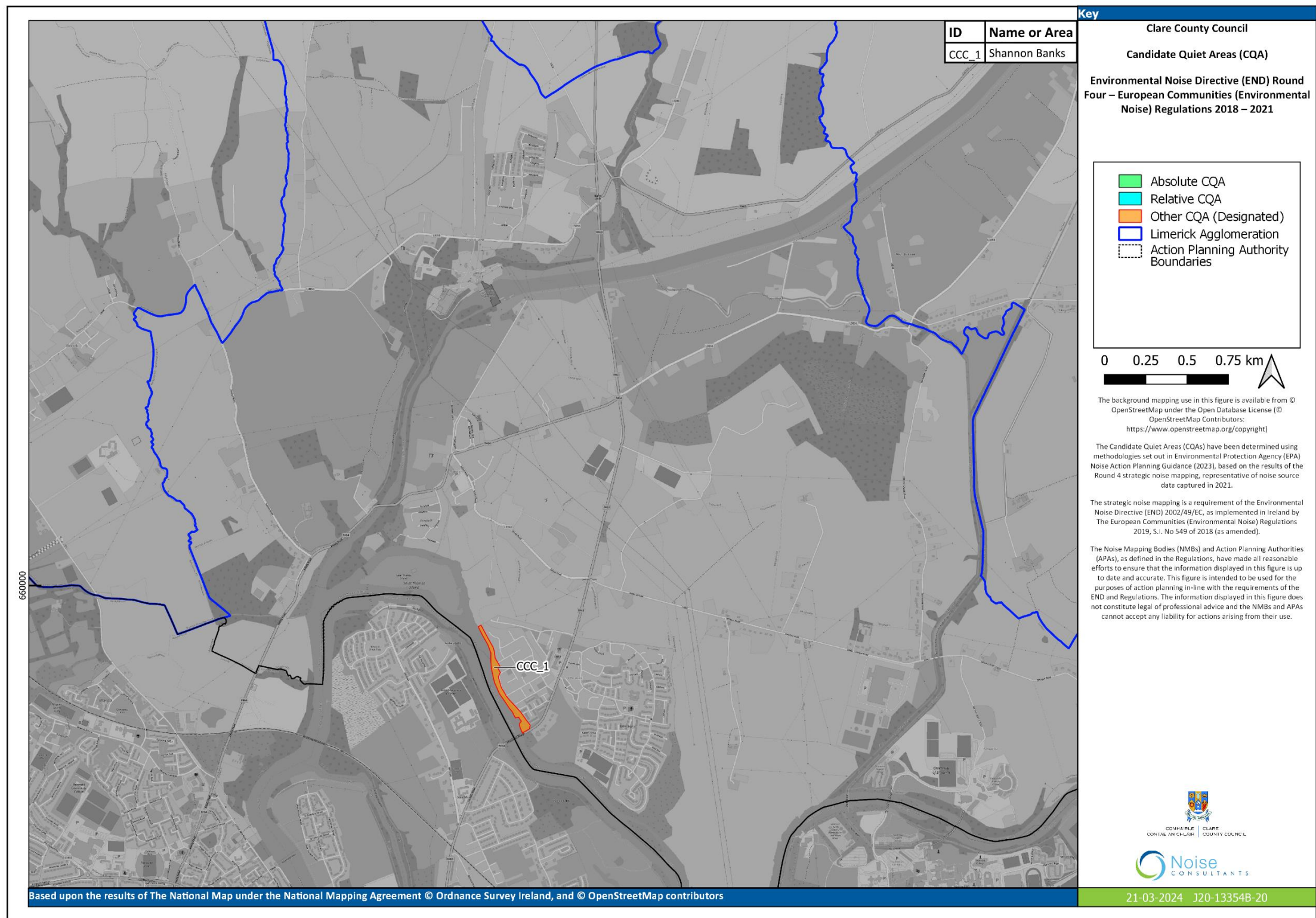


Figure 6.3. Clare County Council: Candidate Quiet Area (CQA).

7 Mitigation, Prevention and Protection Measures

7.1 Introduction

There are three types of approach in the NAP for reducing exposure of the existing and future populations of the Limerick Agglomeration 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 Limerick City and County 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 along major roads. 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 community being exposed to undesirable noise conditions. In the Limerick Agglomeration, these will primarily take the form of planning policy in respect of proposed residential developments and other noise sensitive buildings in potentially noisy environments (e.g. schools, hospitals), in particular adjacent to transportation infrastructure, and 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 investigation of CQAs (identified in **Section 6**) and designation of “Quiet Areas”.

7.2 Mitigation: Areas to be Subject to Noise Management Activities

Priority Important Areas (PIAs) have been identified within the Limerick Agglomeration as those where noise management activities are to be considered during the implementation of the NAP (see **Section 5.6**).

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.

7.2.1 Investigation of Priority Important Areas (PIAs)

Four PIAs have been identified in the Limerick Agglomeration (**Figure 5.3**) for investigation of potential noise mitigation measures:

1. Limerick City;
2. John Carew Park;
3. Ballycummin;
4. Monaleen/Castle Troy.

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 Limerick City and County Council in consultation with the relevant authorities during the implementation of the NAP 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 exposure⁷³ 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 WebTAG⁷⁴ 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

⁷³As 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).

⁷⁴<https://www.gov.uk/government/publications/tag-unit-a3-environmental-impact-appraisal> [Accessed March 2024]

- Recommendation of noise mitigation measure(s) – Limerick City and County Council in consultation with the relevant authorities and subject to resources and funding, will seek to implement the most appropriate noise mitigation measure(s).

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 **Appendix D** including the long-term L_{den} and L_{night} levels they are expected to be exposed to at their most exposed façade from road and railway noise.

The Environmental Noise Regulations 2018 require that in the first instance that priorities shall address the most important areas. As discussed in **Section 5.1**, the EPA Guidance recommends that the identification of most important areas 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 is⁷⁵. 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 environment⁷⁶.

In relation to reducing environmental noise at noise sensitive buildings Limerick City and County Council and Clare County Council will support the implementation of plans, projects and strategies that will reduce car dependency and provide high quality active travel routes providing improved connectivity (e.g. Limerick Shannon Metropolitan Area Transport Strategy (LSMATS)). Where any proposed new road or railway projects may have a negative influence, potentially increasing the exposure of noise sensitive buildings to environmental noise then Limerick City and County Council and Clare 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 and Railway Traffic Noise Management Frameworks (**Figure 7.1** and **7.2**).

⁷⁵ L_{night} is not a relevant noise parameter to consider for schools because they are noise sensitive buildings that are generally occupied during the daytime.

⁷⁶ 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 Technical Memorandum 08-01: Acoustics).



Figure 7.1. Road Traffic Noise Management Framework.



Figure 7.2. Railway Traffic Noise Management Framework.

7.2.3 Infrastructure Projects

While not their intended purpose there are a number of infrastructure projects that may influence the acoustic environment for communities in the Limerick Agglomeration.

7.2.2.1 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 existing Foynes to Limerick rail line, which has been inactive since 2001 is currently being reinstated to be brought back into use. The reinstatement of the Limerick to Foynes rail line and the Foynes to Limerick Road Improvement Scheme will support the expansion of the port.

7.2.2.2 Limerick Shannon Metropolitan Area Transport Strategy

The National Transport Authority in collaboration with Limerick City and County Council, Clare County Council and TII has prepared the Limerick Shannon Metropolitan Area Transport Strategy (LSMATS). The purpose of this is to deliver an integrated transport strategy in the region. The strategy takes account of the current and predicted populations, the National Planning Framework – Ireland 2040, national transport policies, existing plans and strategies in the region, existing transport assets and opportunities. It considers all modes of transportation including walking, cycling, buses (BusConnects), light and heavy rail, car sharing and private vehicles to promote and encourage sustainable transport.

The LSMATS sets out a series of objectives and measures, covering infrastructural, operational and policy elements to be implemented in Limerick over the next 20 years and outlines a framework to deliver the projects in a phased manner. The objectives and measures that may influence the noise environment in the Limerick Agglomeration are presented in **Appendix F**.

7.2.2.3 Coonagh to Knockalisheen Distributor Road

This project which will comprise 3.2 km of high quality urban dual carriageway extending from the Coonagh Roundabout on the R445 to the Knockalisheen Road. The purpose of the road is to provide for high quality access to the Northside Regeneration Area of Limerick and to act as a stimulus for economic growth.

7.2.2.4 Limerick City Centre Public Realm Improvements

Limerick City and County Council has plans to transform the city centre. The developing Limerick Public Realm Strategy will explore the current condition of central Limerick's cityscape, its network of public and green spaces, and will set out a vision and strategy for improvements to guide investment and development in the future.

The strategy will look to further the innovative steps already taken in Limerick such as the creation of pedestrianised zones, the rejuvenation of O'Connell Street, and the development of the quay walks. It will also seek to knit together links between existing Limerick strategy documents, and will be consistent with the aims of the LDP 2022-2028. The strategy offers the opportunity for environmental noise to be considered in the planning and design of new public realm.

7.2.2.5 Opera Square

In November 2020 the development of the Opera Square, the largest commercial property programme investment in Limerick and outside Dublin, got underway in Limerick City. The gross floor area of the scheme is 53,000 square metres comprising a mix of uses including residential, aparthotel, residential/retail, a new city library and a fourteen-storey landmark office building.

The site is being developed by Limerick Twenty Thirty which is a special purpose vehicle established by Limerick City and County Council. A significant emphasis is being placed on public realm which will include a central plaza at the core of the development (**Figure 7.3**) which has the potential to provide low environmental noise levels.



Figure 7.3. Proposed view of the Opera Square central plaza area at the centre of the Opera Site development⁷⁷.

7.2.2.6 Colbert Quarter St Joseph’s Hospital – Draft Masterplan Report

The Health Service Executive’s St. Joseph’s Hospital site in Limerick City, near Colbert Station, is the location of a number of noise sensitive buildings identified in the NAP that are expected to be exposed to high levels of railway noise based on the strategic noise mapping (see **Appendix D**).

The Land Development Agency has outlined plans for a major urban development and rejuvenation project incorporating new urban districts over time delivering potentially 2,800 homes in addition to commercial space, public spaces. The project potentially offers the opportunity to implement good acoustic design including the use of proposed new buildings as an acoustic barrier to railway noise for the hospital.


⁷⁷ limerick2030.ie/portfolio/opera-square/ [Accessed March 2024]

7.3 Other Relevant Plans, Studies and Measures

7.3.1 Measures to reduce traffic density

The County Clare Climate Action Plan 2024-2029 identifies a number of objectives which could indirectly reduce noise pollution as a co-benefit in the Limerick Agglomeration (**Table 7.1**).

Table 7.1. County Clare Climate Action Plan – Measures to reduce traffic density.

 County Clare Climate Action Plan – Measures to reduce Traffic Density					
No	Action	KPI	Lead	Timeframe	Area
T1.1	Deliver active travel projects in towns and villages across the county ^{Note}	Number of projects commenced/delivered	Physical Directorate	Ongoing	Both
T1.4	Develop and adopt an Electric Vehicle Strategy for County Clare	Adoption of Strategy	Physical Directorate	Short-term	Mitigation
T1.7	Expand 30 km/h speed limit zones to more areas of the County	Number of roads with 30 km/h speed limit	Cross-departmental	Medium-term	Mitigation
T1.10	Support the implementation of the Limerick Shannon Metropolitan Area Transport Strategy (LSMATs)	Number of interventions supported	Cross-departmental	Long-term	Both
T1.11	Engage with public transport providers to support enhanced public transport (bus and rail) outcomes including rural bus service expansion and service interconnectivity	Number of engagements	Physical Directorate	Long-term	Both
T1.12	Support the introduction of interventions that enable the uptake of sustainable transportation in communities across Clare	Number of interventions supported	Cross-departmental	Long-term	Both

There are similar measures to those summarised in **Table 7.1** to reduce traffic density in the Draft Limerick Climate Action Plan 2024-2029, with objectives intended to focus on public transport, active travel and modal shift, the Council vehicle fleet and electric vehicle charging.

7.3.2 National Speed Limit Review (2023), Department of Transport

Limerick City and County Council and Clare County 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.

7.3.3 Improving Public Access to information on Environmental Noise

To raise awareness of environmental noise issues and to provide high quality data to the public, Limerick City and County Council will make – real time noise monitoring data from its Type 2 monitors available to the public.

The locations of the Council’s environmental monitors (including air quality and noise) are shown in **Figure 7.4**. The active travel section of Limerick City and County Council funded six new combined noise and air quality monitors to support their programme of works (dashed circles in **Figure 7.4**). It is expected that these will be online and provide real-time data to the public in Quarter 2 of 2024.

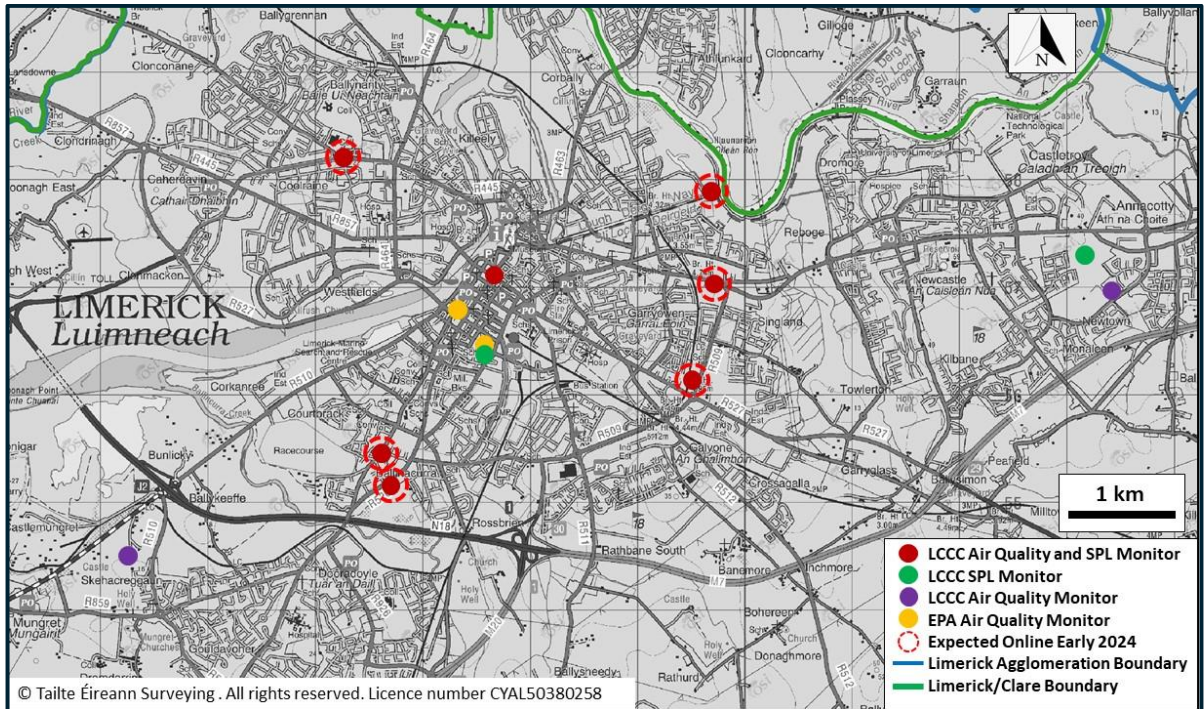


Figure 7.4. Locations of real-time online environmental monitoring available to the public in Limerick⁷⁸.

7.3.4 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).

⁷⁸The real-time online air quality monitoring is available at www.airquality.ie.

7.4 Prevention

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

7.4.1 Limerick City and County Council

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.

7.4.1.1 Professional Practice Guidance on Planning and Noise: New Residential Development (ProPG)

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 7.5**.

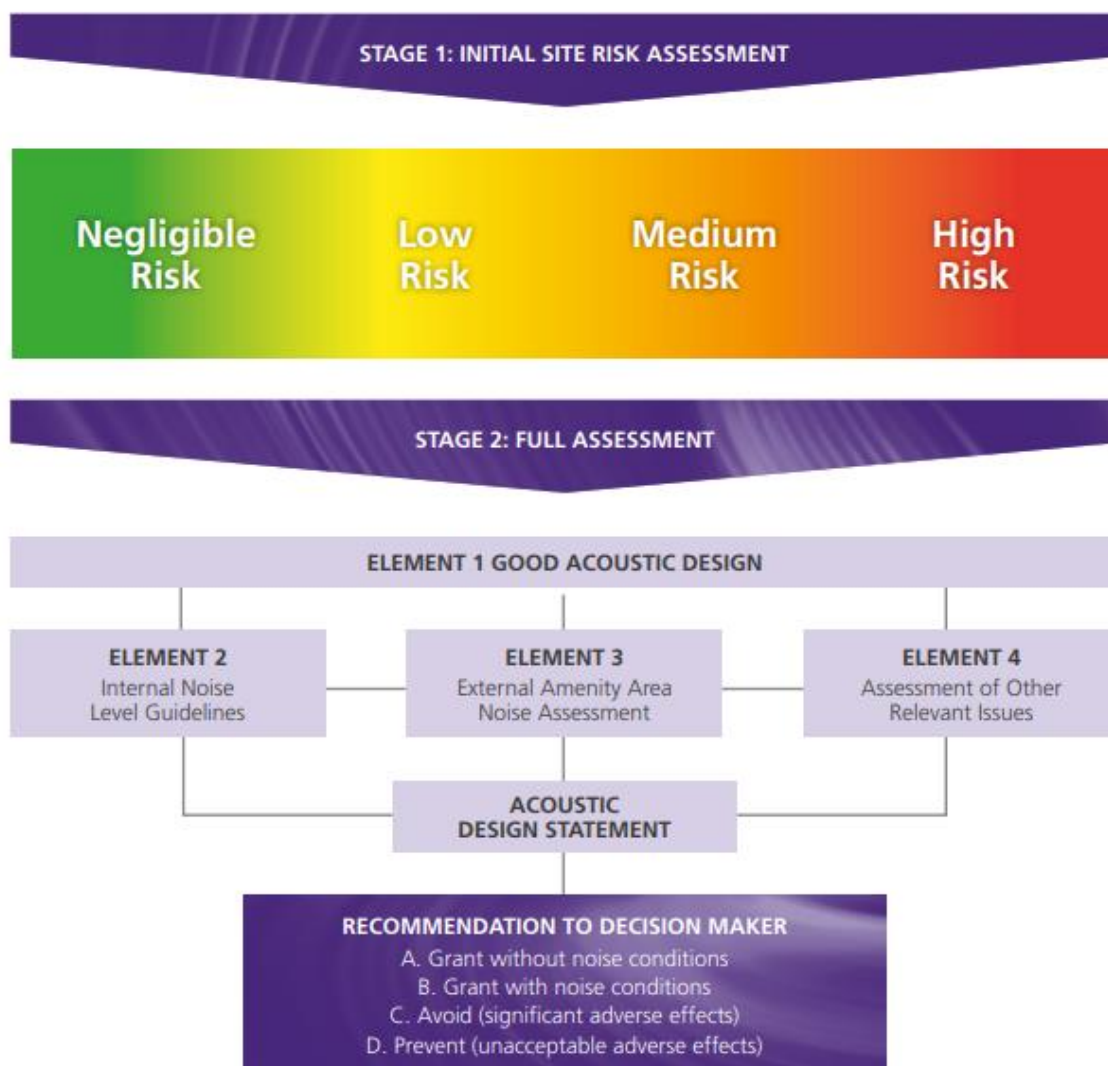


Figure 7.5. Summary of the overall ProPG approach.

Stage 1 is the initial noise risk assessment which 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 7.6 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.

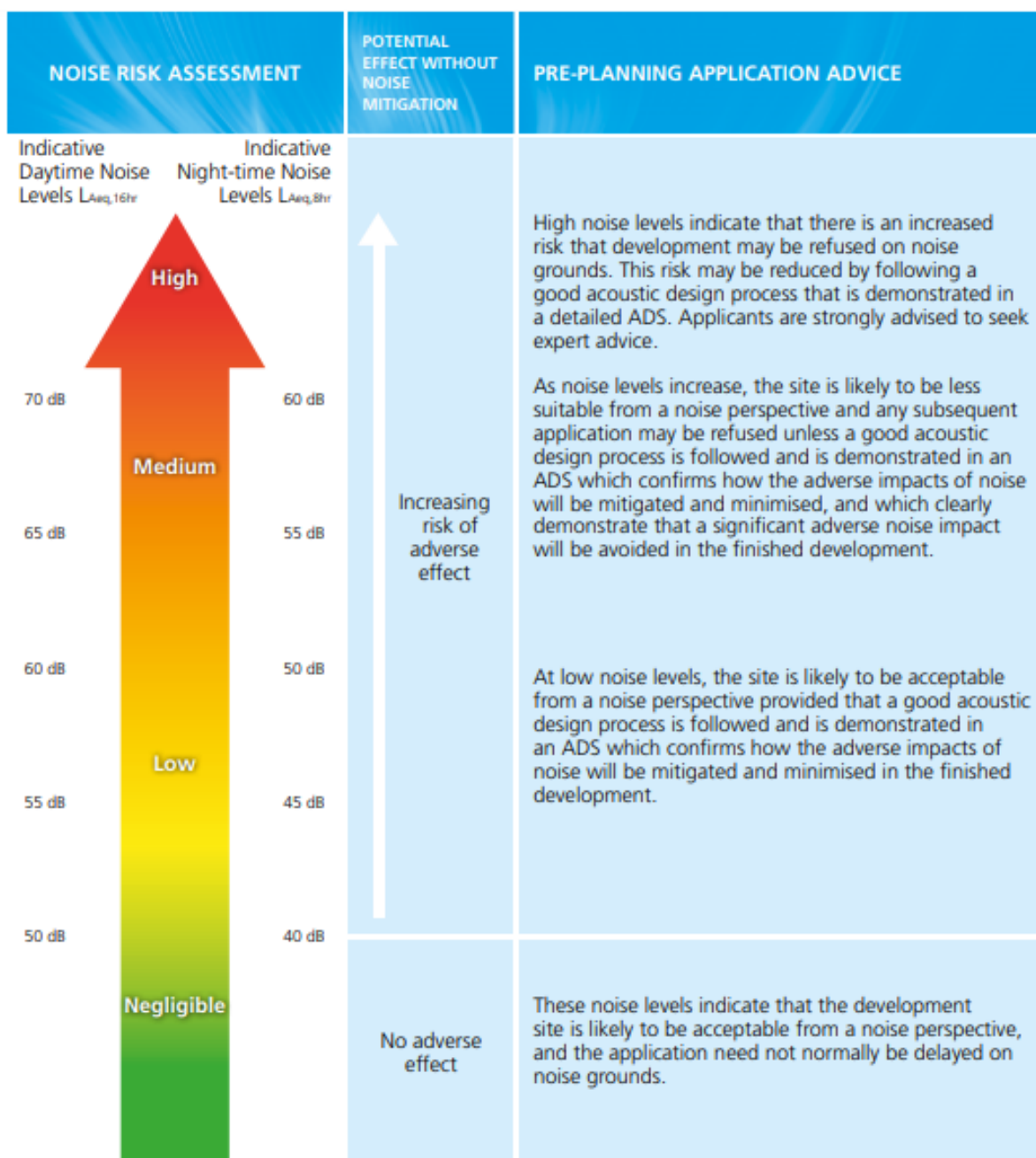


Figure 1 Notes:

- a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is “not dominant”.
- c. $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- d. An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

Figure 7.6. Stage 1 – Initial Site Noise Risk Assessment.

The four key elements to be undertaken under Stage 2, the Full Assessment, 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 acoustic 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 7.2**.

Table 7.2. ProPG Internal Noise Level Guidelines

Activity	Location	L _{Aeq, 16hr} (0700-2300 hrs)*	L _{Aeq, 8hr} (2300-0700 hrs)*
Resting	Living room	35 dB	-
Dining	Dining room/ area	40 dB	-
Sleeping (daytime resting)	Bedroom	35 dB	30 dB [#]

[#]and 45 dB L_{Amax, F}

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 less than, or equal to, 50dB L_{Aeq 16hr}.

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 effects, 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.

7.4.1.1 Public Realm and Noise

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 7.7);
- 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 **Section 3.4.2** and **Section 7.4**).

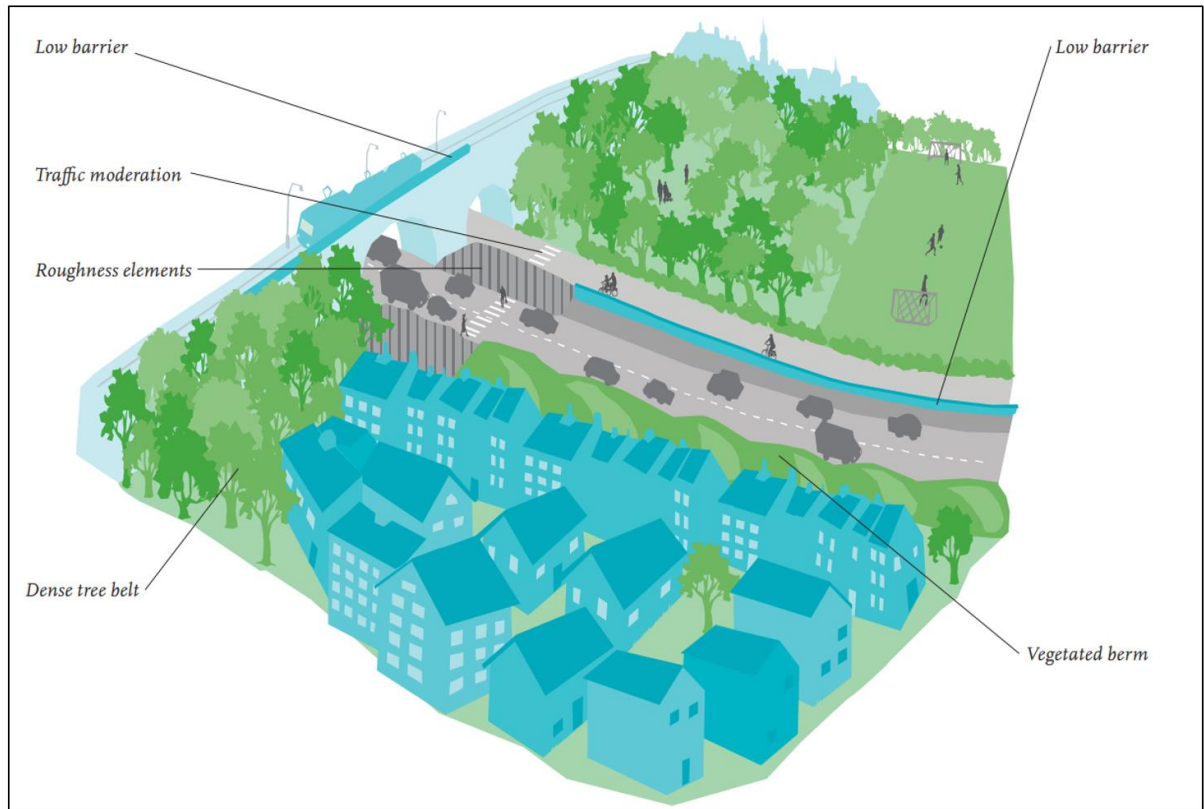


Figure 7.7. Example of combining solutions in areas exposed to road traffic and railway noise⁷⁹.

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.

7.4.2 Clare County Council

Planning Guidance

Clare County Council will endeavour to utilise the planning process as necessary to incorporate the aims of the present and future NAPs into the County Development Plan and into relevant local area plans, protecting larger areas from road noise. Special consideration should be given to zoning objectives, speed limits and established settlements within the area.

Developers are encouraged (or required at the discretion of the Planning Authority) to produce a noise impact assessment and implement mitigation measures as follows:

⁷⁹<http://www.hosanna.bartvanderaa.com/index.php?id=1> [Accessed March 2024]

- for proposed new residential developments within the current action planning area or for developments proposed near major roads (i.e. traffic volumes in excess of 3 million vehicles per annum or otherwise on a case-by-case basis);
- where developments are planned adjacent to major roads, to incorporate good acoustic design e.g. designing the development so that the access road is adjacent to the major road noise source. It may also involve the use of buffer zones and/or noise barriers and traffic calming measures;
- to ensure that all future developments are designed and constructed so as to minimise noise disturbance for residents, where appropriate.

ProPG is recommended to be considered in the proposal for new residential development and provides a useful reference guide to those in the administrative area of Clare County Council to encourage the implementation of good acoustic design from the earliest stages of the planning process.

7.5 Protection

Below are the approaches being taken by Limerick City and County Council and Clare County Council to protect public spaces that provide communities with calm and tranquility.

7.5.1 Limerick City and County Council

Where an appropriate benefit is determined the outcomes of the investigations of the Candidate Quiet Areas (CQAs) summarised in **Table 6.3** will be forwarded to the EPA for consideration in consultation with the Minister, with successful applications resulting in a delimitation of Quiet Areas.

Actions taken will include sound pressure level monitoring where feasible and engaging with citizens to assess the Candidate Quiet Areas using a soundscape approach.

It should be acknowledged that the soundscape (the perceived response to the acoustic environment) of our green and open spaces can benefit mental health. These spaces facilitate walks, child play and other leisure activities that promote social interaction and positive emotions (e.g. **Figure 7.8**).



Figure 7.8. Part of the Limerick Greenway providing natural play for children.

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 framework⁸⁰, 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 soundwalks⁸¹ 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 7.9**). User feedback is collected through a predefined questionnaire structured in three sections on the soundscape, general and behavioural issues and questions are

⁸⁰<https://opensourcesoundscapes.org/hush-city/> [Accessed March 2024]

⁸¹Soundwalks 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.

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.

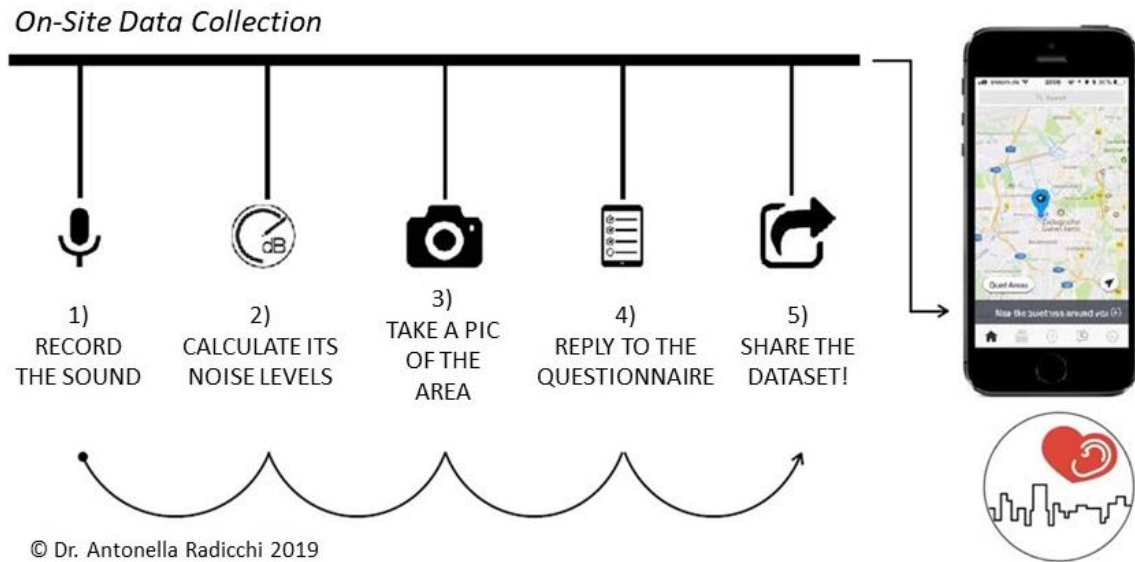


Figure 7.9. The sequential collection of data to investigate quiet areas with the Hush City app. The app is available at the weblink <https://opensourceoundscapes.org/hush-city/>.

Engaging with communities to assess the quiet public places 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 EPA criteria might not be met.

Where an appropriate benefit is determined from investigations of the Candidate Quiet Areas 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 should also be used 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 to 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.

7.5.2 Clare County Council

During the implementation of the NAP, Clare County Council shall investigate the Candidate Quiet Area summarised in **Table 6.4** (Shannon Banks walkway) with any application being forwarded to the EPA for consideration in consultation with the Minister, with successful applications resulting in a delimitation of Quiet Areas. The Council will consider measures to ensure the environmental noise quality in quiet areas are preserved, with careful management of activities which would impact upon the acoustic environment.

After any successful application for the delimitation of a Quiet Area, a corresponding policy statement shall be suggested, detailing how Clare County Council might aid in safeguarding the Quiet Area. This may include extending speed limit restrictions around built-up areas.

Draft versions of any policy statement, and associated measures, should form part of a public consultation process. Quiet Areas should be considered within future County Development Plans and relevant Local Area Plans to promote their protection.

8 Public Consultation

Limerick City and County Council and Clare County Council are responsible for the implementation of the Agglomeration Round 4 NAP (2024-2028) within their administrative areas.

The Draft Agglomeration Round 4 NAP 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, Limerick Post and Clare Champion. Hard copies of the NAP will be placed on display at:

- Limerick City and County Council, City Hall, Merchants Quay, Limerick;
- Limerick City and County Council, County Hall, Dooradoyle Limerick,
- Limerick County Library, Dooradoyle, Limerick;
- Limerick City Library, Barrow House, Michael Street, Limerick;
- Clare County Council, Áras Contae an Chláir, New Road, Ennis, Co. Clare; and
- Shannon Municipal District, Town Hall, Shannon, Co. Clare.

In addition, the Draft Plan is available through:

- the Limerick City and County Council public consultation website at <https://mypoint.limerick.ie/>;
- Clare County Council public consultation website at <https://yoursay.clarecoco.ie/>.

Submissions can be made for the administrative areas of Limerick City and County Council and Clare County Council at the websites above, by email to noiseactionplan@limerick.ie and noiseactionplan@clarecoco.ie, respectively. Alternatively, submissions can be made in writing to:

Senior Engineer,
Environment and Climate Action,
Limerick City and County Council,
County Hall, Dooradoyle Road,
Dooradoyle,
Limerick.
V94 WV78.

Senior Engineer,
Environment,
Clare County Council,
Áras Contae an Chláir, New Road,
Ennis,
County Clare
V95 DXP2.

Other contact details:

Limerick City and County Council
Telephone: **+353 61 556000**
Email: customerservices@limerick.ie

Clare County Council
Telephone: **+353 65 6821616**
Email: customerservices@clarecoco.ie

9 Long-term Strategy

9.1 Noise Action Plan Implementation Commitments

This NAP 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 by the Limerick City and County Council and Clare County Council Development Plans and a series of commitments below (**Implementation Actions**).

9.2 Noise Policy Statement

Limerick City and County Council and Clare County Council will adopt a strategic approach to managing environmental noise within the Limerick Agglomeration, with the following overarching policy principles:

- **Mitigation Measures** - 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 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 Key Round 5 Timetables

The Round 4 NAP timetable is set out in **Section 1.6**, with the deadline for the submission of the NAP to the European Environment Agency (EEA) on 18 January 2025.

Specific dates relating to Round 5 NAPS are to be determined, but are expected to be:

- July-September 2027: Develop draft Round 5 NAP.
- January-March 2028: Public consultation (6-8 weeks).
- 18 July 2028: Deadline for Round 5 NAPs.
- 18 August 2028: Deadline for publishing NAPs.
- 18 August 2028: Summaries of NAPs submitted to the EPA.
- 18 January 2029: NAPs to be reported to the EEA by the EPA.

9.4 Implementation Actions

The implementation of the NAP spans a four-year time frame, beginning in 2024. Limerick City and County Council (LCCC) and Clare County Council (CCC) commit 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 transportation 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 transport and industry sectors, it is important to emphasise that Limerick City and County Council and Clare County Council, in some instances, do 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 G**.

Table 9.1. Limerick Agglomeration: Noise Management Framework – summary of measures.

Measures		Summary Actions	Timescale
Noise Action Plan 2024-2028 Preparation			
		Noise Action Plan Finalised	18 July 2024
General - Noise Management Measures			
LCCC1.1	CCC1.1	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	CCC1.2	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	CCC1.3	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	CCC1.4	Continued investigation and management of complaints	Review and investigate all noise complaints received in line with Customer Charters and in accordance with national and international best practice.
			Ongoing
LCCC1.5	CCC1.5	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	CCC1.6	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 CQAs 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	Maintain the existing ambient noise monitoring network and review the need for expansion in accordance with the needs or monitoring requirements of this NAP and other projects. Environmental noise monitoring is to be made available to the public through an online dashboard.
			Ongoing

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

Measures			Summary of Actions	Time Scale
Mitigation - Noise Management Measures				
LCCC2.1	CCC2.1	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	CCC2.2	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	CCC3.1	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	CCC3.2	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	CCC3.3	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). Limerick Agglomeration: Noise Management Framework – Summary of measures.

Measures		Summary of Actions	Time Scale	
Protection - Noise Management Measures				
LCCC4.1	CCC4.1	Evaluation of Candidate Quiet Areas (CQAs)	For each shortlisted CQA 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	CCC4.2	Proposal for Quiet Areas(s) designation	For all Candidate Quiet Areas 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 CQAs	In relation to Measure LCCC4.1 evaluate the soundscape of CQAs 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.
- CCC** Clare County Council.
- CQA** Candidate Quiet Area.

CNOSSOS-EU: 2020	The common noise assessment method according to the END.
CRTN 1988	The noise calculation method Calculation of Road Traffic Noise 1988.
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.
Free Field	Free field noise levels are measured or predicted such that there is no contribution made up of reflections from nearby building façades.
Leq,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.
Leq,16hr	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 of 16 hours.

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

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

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

Levening 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).

Lnight 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).

LCCC Limerick City and County Council.

LDP Limerick Development Plan.

LSMATS Limerick Shannon Metropolitan Area Strategy.

MIA Most Important Area.

NAP Noise Action Plan.

NPO National Policy Objective in the National Development Plan.

NRA National Roads Authority.

NTA National Transport Authority.

PIA Priority Important 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 C: Action Planning Authority Summary of the Results of the Noise Mapping Process

C.1 Limerick City and County Council

The Round 4 noise exposure statistics and harmful effects assessment are presented for the Limerick City and County Council administrative area.

Exposure statistics are assessed independently for each noise source and are summarised for the noise metrics across the noise exposure bands defined in the Environmental Noise Regulations. The population exposure statistics have been rounded to the nearest 100 as required by the Regulations.

Exposure Statistics

Table C.1. LCCC: Number of people in dwellings – L_{den}.

Noise Exposure (dB L _{den})	All Roads	All Railway	All Industry
55-59	23,600	800	0
60-64	12,700	700	0
65-69	4,700	100	0
70-74	600	0	0
>=75	0	0	0

**exposure statistics rounded to the nearest 100.*

Table C.2. LCCC: Number of people in dwellings – L_{night}.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	10,000	400	0
55-59	800	100	0
60-64	400	100	0
65-69	100	0	0
>=70	0	0	0

**exposure statistics rounded to the nearest 100.*

Table C.3. LCCC: Percentage of total population exposed to the noise source– L_{den} .

Noise Exposure (dB L_{den})	All Roads	All Railway	All Industry
55-59	25 %	1 %	0 %
60-64	14 %	1 %	0 %
65-69	5 %	0 %	0 %
70-74	1 %	0 %	0 %
≥ 75	0 %	0 %	0 %

Table C.4. LCCC: Percentage of total population exposed to the noise source– L_{night} .

Noise Exposure (dB L_{night})	All Roads	All Railway	All Industry
50-54	11 %	1 %	0 %
55-59	1 %	0 %	0 %
60-64	0 %	0 %	0 %
65-69	0 %	0 %	0 %
≥ 70	0 %	0 %	0 %

Table C.5. LCCC: Number of school buildings (and hospital buildings) – L_{den} .

Noise Exposure (dB L_{den})	All Roads	All Railway	All Industry
55-59	36 (01)	00 (01)	00 (00)
60-64	19 (03)	03 (03)	00 (00)
65-69	10 (01)	00 (00)	00 (00)
70-74	00 (00)	00 (01)	00 (00)
≥ 75	00 (00)	00 (00)	00 (00)

Table C.6. LCCC: Number of school buildings (and hospital buildings) – L_{night}.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	15 (02)	02 (02)	00 (00)
55-59	00 (00)	00 (01)	00 (00)
60-64	00 (00)	00 (01)	00 (00)
65-69	00 (00)	00 (00)	00 (00)
>=70	00 (00)	00 (00)	00 (00)

Table C.7. LCCC: Total number of Noise Sensitive Buildings.

Noise Sensitive Building	Number of Noise Sensitive Buildings in the Strategic Noise Maps
Schools	98
Hospitals	14

Harmful Effects

The exposure of harmful effects is assessed independently for each source. Where the same people are simultaneously exposed to different noise sources, the harmful effects may not, in general, be cumulated, however they can be compared to identify proportional significance.

Table C.8 and **C.9** present the calculated harmful effects in the case of road traffic noise for the Limerick City and County Council administrative area and Limerick Agglomeration, and **Table C.10** and **C.11** present the calculated harmful effects from railway noise.

As shown in **Table C.8** the expected proportion of the total population with harmful effects associated with road and rail traffic noise in the Limerick City and County Council administrative area is similar with that across the Limerick Agglomeration.

Table C.8. LCCC: Breakdown of harmful effects in the case of road noise – total number of people.

Harmful Effect	Limerick Agglomeration	Limerick City and County Council
Ischaemic Heart Disease	7.12	6.93
Highly Annoyed	7916.33	7695.92
Highly Sleep Disturbed	1386.82	1372.19
Total Populations		
Limerick Agglomeration: 101,028.86, Limerick City and County Council: 94,469.19, Clare County Council: 6,559.671		

Table C.9. LCCC: Breakdown of harmful effects in the case of road noise – % of population.

Harmful Effect	Limerick Agglomeration	Limerick City and County Council
Ischaemic Heart Disease	0.01%	0.01%
Highly Annoyed	7.84%	8.15%
Highly Sleep Disturbed	1.37%	1.45%

Table C.10. LCCC: Breakdown of Harmful Effects in the Case of Railway Noise – Total number of people.

Harmful Effect	Limerick Agglomeration	Limerick City and County Council
Highly Annoyed	312.39	312.39
Highly Sleep Disturbed	115.58	115.58

Table C.11. LCCC: Breakdown of harmful effects in the case of railway noise – % of population.

Harmful Effect	Limerick Agglomeration	Limerick City and County Council
Highly Annoyed	0.31%	0.33%
Highly Sleep Disturbed	0.11%	0.12%

C.2 Clare County Council

The Round 4 noise exposure statistics and harmful effects assessment are presented for the Clare County Council administrative area.

Exposure statistics are assessed independently for each noise source and are summarised for the noise metrics across the noise exposure bands defined in the Regulations. The population exposure statistics have been rounded to the nearest 100 as required by the Regulations.

9.4.1 Exposure Statistics

Table C.12. CCC: Number of people in dwellings – L_{den}.

Noise Exposure (dB L _{den})	All Roads	All Railway	All Industry
55-59	900	0	0
60-64	300	0	0
65-69	100	0	0
70-74	0	0	0
>=75	0	0	0

**exposure statistics rounded to the nearest 100.*

Table C.13. CCC: Number of people in dwellings – L_{night}.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	0	0	0
55-59	0	0	0
60-64	0	0	0
65-69	0	0	0
>=70	0	0	0

**exposure statistics rounded to the nearest 100.*

Table C.14. CCC: Percentage of total population exposed to the noise source.

Noise Exposure (dB L _{den})	All Roads	All Railway	All Industry
55-59	13 %	0 %	0 %
60-64	5 %	0 %	0 %
65-69	1 %	0 %	0 %
70-74	0 %	0 %	0 %
>=75	0 %	0 %	0 %

Table C.15. CCC: Percentage of total population exposed to the noise source.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	1 %	0 %	0 %
55-59	0 %	0 %	0 %
60-64	0 %	0 %	0 %
65-69	0 %	0 %	0 %
>=70	0 %	0 %	0 %

Table C.16. CCC: Number of school buildings (and hospital buildings) – L_{den}.

Noise Exposure (dB L _{den})	All Roads	All Railway	All Industry
55-59	02 (00)	00 (00)	00 (00)
60-64	00 (00)	00 (00)	00 (00)
65-69	00 (00)	00 (00)	00 (00)
70-74	00 (00)	00 (00)	00 (00)
>=75	00 (00)	00 (00)	00 (00)

Table C.17. CCC: Number of school buildings (and hospital buildings) – L_{night}.

Noise Exposure (dB L _{night})	All Roads	All Railway	All Industry
50-54	00 (00)	00 (00)	00 (00)
55-59	00 (00)	00 (00)	00 (00)
60-64	00 (00)	00 (00)	00 (00)
65-69	00 (00)	00 (00)	00 (00)
>=70	00 (00)	00 (00)	00 (00)

Table C.18. CCC: Total number of Noise Sensitive Buildings.

Noise Sensitive Building	Number of Noise Sensitive Buildings in the Strategic Noise Maps
Schools	6
Hospitals	0

Harmful Effects

The exposure of harmful effects is assessed independently for each source. Where the same people are simultaneously exposed to different noise sources, the harmful effects may not, in general, be cumulated, however they can be compared to identify proportional significance.

Table C.19 and **C.20** present the calculated harmful effects in the case of road traffic noise for the Clare County Council and the Limerick Agglomeration, and **Table C.21** and **C.22** present the calculated harmful effects from railway noise.

As shown in **Table C.19** the expected proportion of the total population with harmful effects associated with road traffic noise in the Clare County Council administrative area is relatively small when compared to the Limerick Agglomeration.

Table C.19. CCC: Breakdown of harmful effects in the case of road noise – Total number of people.

Harmful Effect	Limerick Agglomeration	Clare County Council
Ischaemic Heart Disease	7.12	0.18
Highly Annoyed	7916.33	220.41
Highly Sleep Disturbed	1386.82	14.63
Total Populations		
Limerick Agglomeration: 101,028.86, Limerick City and County Council: 94,469.19, Clare County Council: 6,559.671		

Table C.20. CCC: Breakdown of harmful effects in the case of road noise – % of population.

Harmful Effect	Limerick Agglomeration	Clare County Council
Ischaemic Heart Disease	0.01%	0.00%
Highly Annoyed	7.84%	3.36%
Highly Sleep Disturbed	1.37%	0.22%

Table C.21. CCC: Breakdown of harmful effects in the case of railway noise – Total number of people.

Harmful Effect	Limerick Agglomeration	Clare County Council
Highly Annoyed	312.39	0.00
Highly Sleep Disturbed	115.58	0.00

Table C.22. CCC: Breakdown of harmful effects in the case of railway noise – % of population.

Harmful Effect	Limerick Agglomeration	Clare County Council
Highly Annoyed	0.31%	0.00%
Highly Sleep Disturbed	0.11%	0.00%

Appendix D: Noise Sensitive Buildings

Table D.1. Limerick Agglomeration – Noise Sensitive Buildings in relation to Table 4.5 with the calculated maximum L_{den} and L_{night} greater or equal to 55 dB L_{den} and 50 dB L_{night} for road noise based on the strategic noise mapping at the most exposed façade. (Source of buildings data - OSi Prime2 dataset)

Name	Address	County	L_{den}	L_{night}
St. Patrick's Girls N. S.	Dublin Road	Limerick	69.4	55.0
Barrington Hospital	George's Quay	Limerick	68.8	53.3
Gaelcoláiste Luimnigh	Sir Harry's Mall	Limerick	68.6	54.6
Limerick School Project	O'Connell Avenue	Limerick	68.3	53.4
Griffith College	Quinlan Street	Limerick	68.2	53.9
Gerald Griffin Memorial School	Bridge Street	Limerick	66.4	51.0
Scoil and Spioraid Naoimh	Roxborough	Limerick	66.4	52.1
Salesian Primary School	North Circular Road	Limerick	65.2	50.6
Presentation Secondary School	Sexton Street	Limerick	65.2	50.7
Limerick Adult Education College, VEC	Sexton Street	Limerick	65.1	50.6
Saint Mary's N. S.	King's Island	Limerick	65.1	50.7
LIT George's Quay	George's Quay	Limerick	64.8	50.0
Our Lady Queen of Peace Primary School	Childers Road	Limerick	64.4	49.6
Limerick Tutorial College	Newenham Street	Limerick	64.3	50.1
Limerick and Clare Education & Training Board	Dooradoyle Road	Limerick	64.0	51.5
St. Joseph's Hospital (Main Building)	Mulgrave Street	Limerick	63.8	49.2
Limerick School of Art and Design	Clare Street	Limerick	63.7	48.3
University Hospital Limerick	St. Nessian's Road	Limerick	63.7	53.9
University of Limerick (Bernal Inst.)	Castletroy	Limerick	63.3	47.9
Le Chéile N. S.	Rathbane North	Limerick	63.0	49.4
Scoil Íde	Corbally	Limerick	62.6	47.8
Saint Nessian's N. S.	Baunacloka	Limerick	62.4	48.3
Ardscoil Rís	North Circular Road	Limerick	62.1	47.5
JFK Memorial School	Ennis Road	Limerick	61.9	46.1
St. John's Girls and Infant Boys School	Garryowen Road	Limerick	61.9	46.9
St. Paul's N. S.	O'Connell Avenue	Limerick	61.8	47.9
Limerick Tutorial College	O'Connell Avenue	Limerick	61.8	45.9
Saint Brigid's N. S.	Singland	Limerick	61.6	47.0
Scoil Íde (Unnamed building)	Corbally	Limerick	61.4	46.6
Bawnmore School	Bawnmore	Limerick	61.3	52.9
The Model Primary School	O'Connell Avenue	Limerick	61.0	46.2
University of Limerick (Glucksman Library)	Castletroy	Limerick	60.9	45.6
TUS	Moylish	Limerick	59.8	44.8

Table D.1 (Continued). Noise Sensitive Buildings in relation to Table 4.5 with the calculated maximum L_{den} and L_{night} greater or equal to 55 dB L_{den} and 50 dB L_{night} for road noise based on the strategic noise mapping at the most exposed façade. (Source of buildings data - OSi Prime2 dataset)

Name	Address	County	L_{den}	L_{night}
Thomond Primary School	Ballynanty Beg	Limerick	59.6	44.7
Bawnmore Residential Service	Bawnmore	Limerick	59.6	51.1
St. John's Hospital	Irishtown	Limerick	59.5	44.6
Limerick School of Art and Design	Clare Street	Limerick	59.4	44.7
University of Limerick (Block 1)	Castletroy	Limerick	59.4	44.1
St. Patrick's Boys N. S.	Dublin Road	Limerick	59.4	45.2
Saint Vincent's Centre	Lisnagry	Limerick	59.4	45.9
Mary Immaculate College	Courtbrack	Limerick	59.4	45.0
University of Limerick (Nexus Inn. Centre)	Castletroy	Limerick	59.4	44.0
Limerick College of Further Education	Mulgrave Street	Limerick	59.3	44.5
Ardscoil Mhuire	Corbally	Limerick	59.2	44.9
John Henry Newman Campus (MIC)	Mount Saint Vincent	Limerick	59.0	45.1
Gaelscoil An Ráithín	Mungret	Limerick	58.9	46.2
Limerick College of Further Education	Kilmallock Road	Limerick	58.7	47.6
Our Lady of Lourdes Primary School	Childers Road	Limerick	58.5	49.8
Scoil Mháthair Dé	South Circular Road	Limerick	58.5	45.0
Gaelscoil Sáirséal	Shelbourne Rd	Limerick	57.8	42.6
Milford N. S.	Castletroy	Limerick	57.8	42.3
Sexton Street CBS	Sexton Street	Limerick	57.8	42.4
Gaelscoil Sheoirse Clancy	Rathbane North	Limerick	57.1	47.3
St. Gabriel's School and Centre	Mungret	Limerick	57.0	44.8
St. Gabriel's School and Centre	Dooradoyle	Limerick	57.0	48.2
Crescent College Comprehensive	Dooradoyle Road	Limerick	57.0	48.3
Redemptionist School of Music	King's Island	Limerick	57.0	42.4
Summerville House, MIC	Courtbrack	Limerick	56.7	40.4
Crescent Comprehensive (Rear Building)	Dooradoyle Road	Limerick	56.5	47.8
Limerick and Clare Education and Training Board (Unnamed building)	Dooradoyle Road	Limerick	56.2	47.2
Monaleen N. S. (Unnamed building)	Monaleen	Limerick	56.1	46.6
Gaelscoil Chaladh an Treoigh	Dublin Road	Limerick	56.0	42.0
Catherine McAuley School	South Circular Road	Limerick	56.0	42.2
Parteen N. S. (North Building)	Parteen	Clare	56.0	40.1
Monaleen N. S. (Main Building)	Monaleen	Limerick	55.9	47.6
Castletroy College (Main Building)	Castletroy	Limerick	55.6	46.5

Table D.1 (Continued). Noise Sensitive Buildings in relation to Table 4.5 with the calculated maximum L_{den} and L_{night} greater or equal to 55 dB L_{den} and 50 dB L_{night} for road noise based on the strategic noise mapping at the most exposed façade. (Source of buildings data - OSi Prime2 dataset)

Name	Address	County	L_{den}	L_{night}
St. Paul's Montessori School	Dooradoyle	Limerick	55.4	46.6
Parteen N. S. (South Building)	Parteen	Clare	55.3	39.4
Donoughmore N. S.	Donoughmore	Limerick	55.3	46.8
Harnett Enterprise Accelerator Centre	Moylish	Limerick	55.2	39.9
University Maternity Hospital	Ennis Road	Limerick	60.1	44.0

Table D.2. Limerick Agglomeration – Noise Sensitive Buildings in relation to Table 4.5 with the calculated maximum L_{den} and L_{night} greater or equal to 55 dB L_{den} and 50 dB L_{night} for railway noise based on the strategic noise mapping at the most exposed façade. (Source of buildings data - OSi Prime2 dataset)

Name	Address	County	L_{den}	L_{night}
St. Joseph's Hospital (Saint Canice's)	Mulgrave Street	Limerick	72.4	62.7
St. Joseph's Hospital (Rehabilitation Centre)	Mulgrave Street	Limerick	64.1	55.1
Corpus Christi N. S.	Moyross	Limerick	63.0	51.0
St. Joseph's Hospital (Ashleigh Lodge)	Mulgrave Street	Limerick	62.6	53.7
Coláiste Michíl - CBS	Sexton Street	Limerick	61.2	52.1
St. Joseph's Hospital (Unnamed building)	Mulgrave Street	Limerick	60.1	51
St. Joseph's Hospital (Unnamed Building)	Ballysimon Road	Limerick	59.4	50.8

Appendix E: Summary of the Areas to be Subject to Noise Management Activities

E.1 Areas to be Subject to Noise Management Activities (Industry)

The industry sites included within the Agglomeration strategic noise maps are limited to Industrial Emission (IE) sites as regulated by the EPA under the IPPC Directive 96/61 EC. Strategic noise maps of the industrial noise emissions are shown in **Figures 4.5 and 4.6**.

The data upon which the industry noise emission models have been developed includes default values, therefore model outputs are a strategic representation of industry noise levels, rather than being site specific.

The requirement for site specific noise management of waste, Industrial Emission (IE) and Integrated Pollution Control (IPC) licensed sites is the responsibility of the EPA.

E.2 Areas to be Subject to Noise Management Activities (Roads)

The methodology for identifying areas to be subject to noise management activities is set out in **Section 5**. The Priority Important Areas are listed in **Table 5.3** and **Table 5.4**, with a summary of the Priority Important Area harmful effects statistics, and how they compare to the Action Planning Authority area harmful effects, presented as a percentage.

Figures showing the Priority Important Areas are presented in the following section (**Figure E.3 to Figure E.7**). Limerick City and County Council are committed to undertaking an assessment of the noise mitigation measure options relating to the Priority Important Area within the life cycle of the NAP.

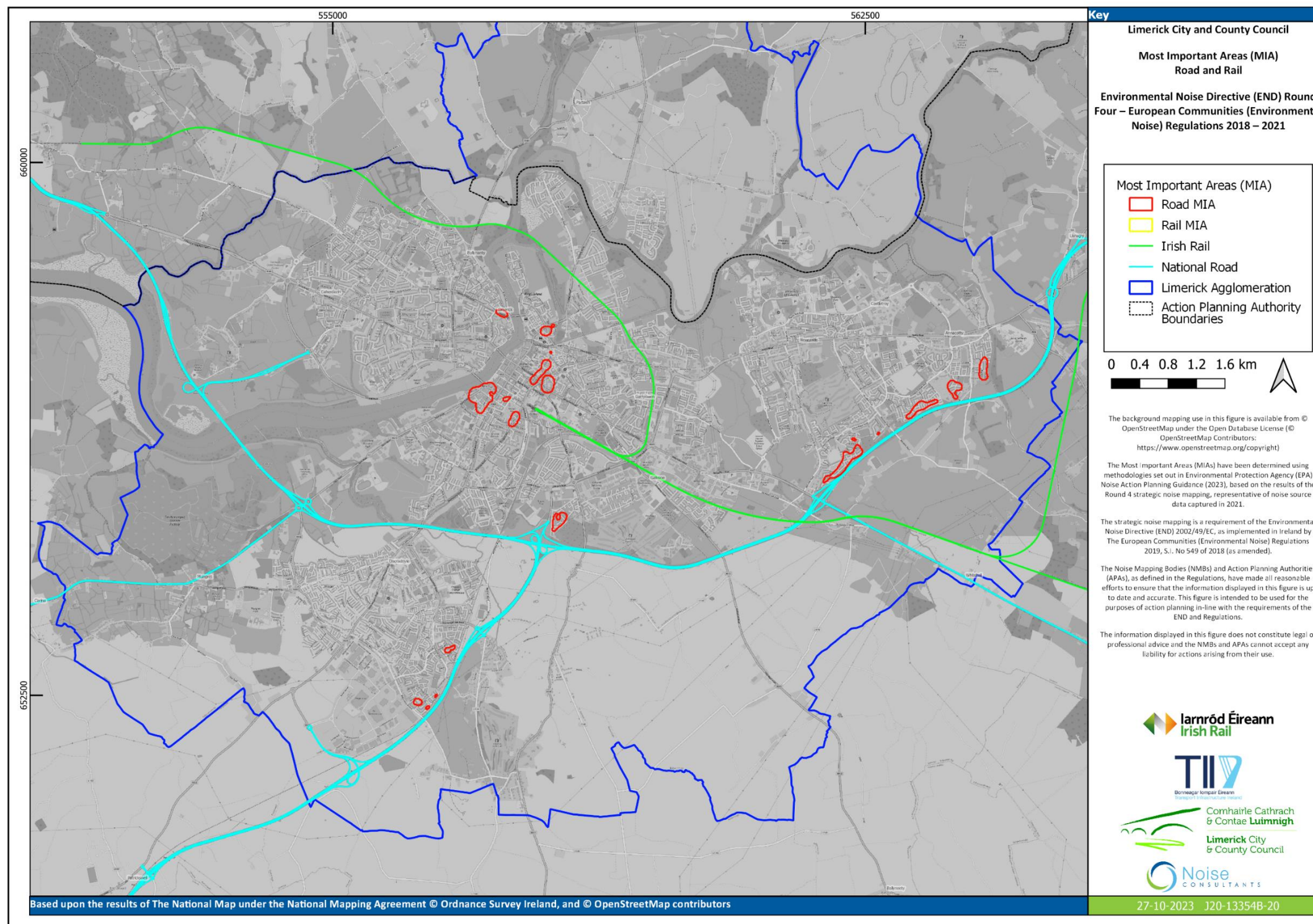


Figure E.1. Limerick City and County Council: Roads - Most Important Areas (MIAs).

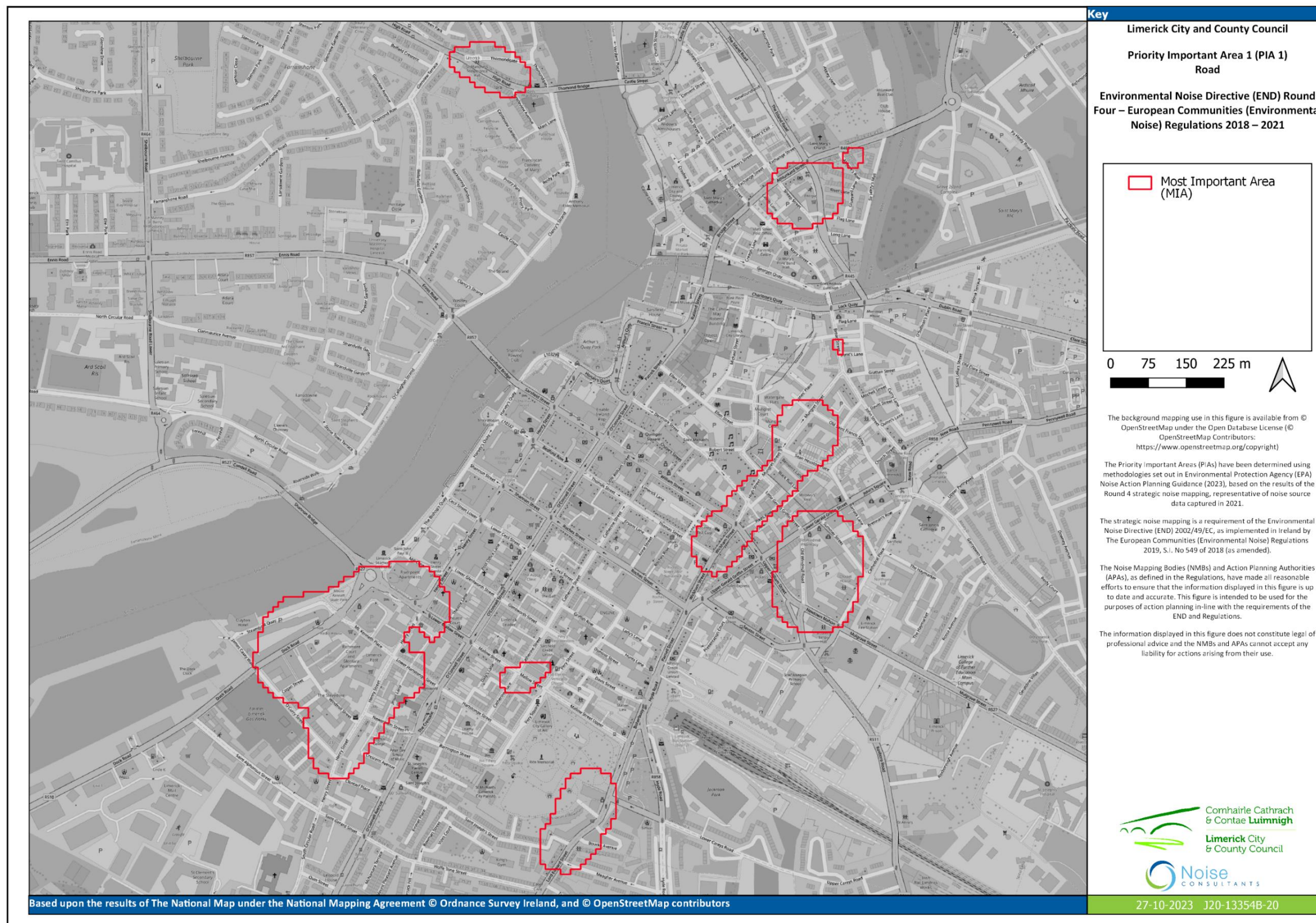


Figure E.2. Limerick City and County Council: Roads - Priority Important Area 1 (PIA 1) – Limerick City.

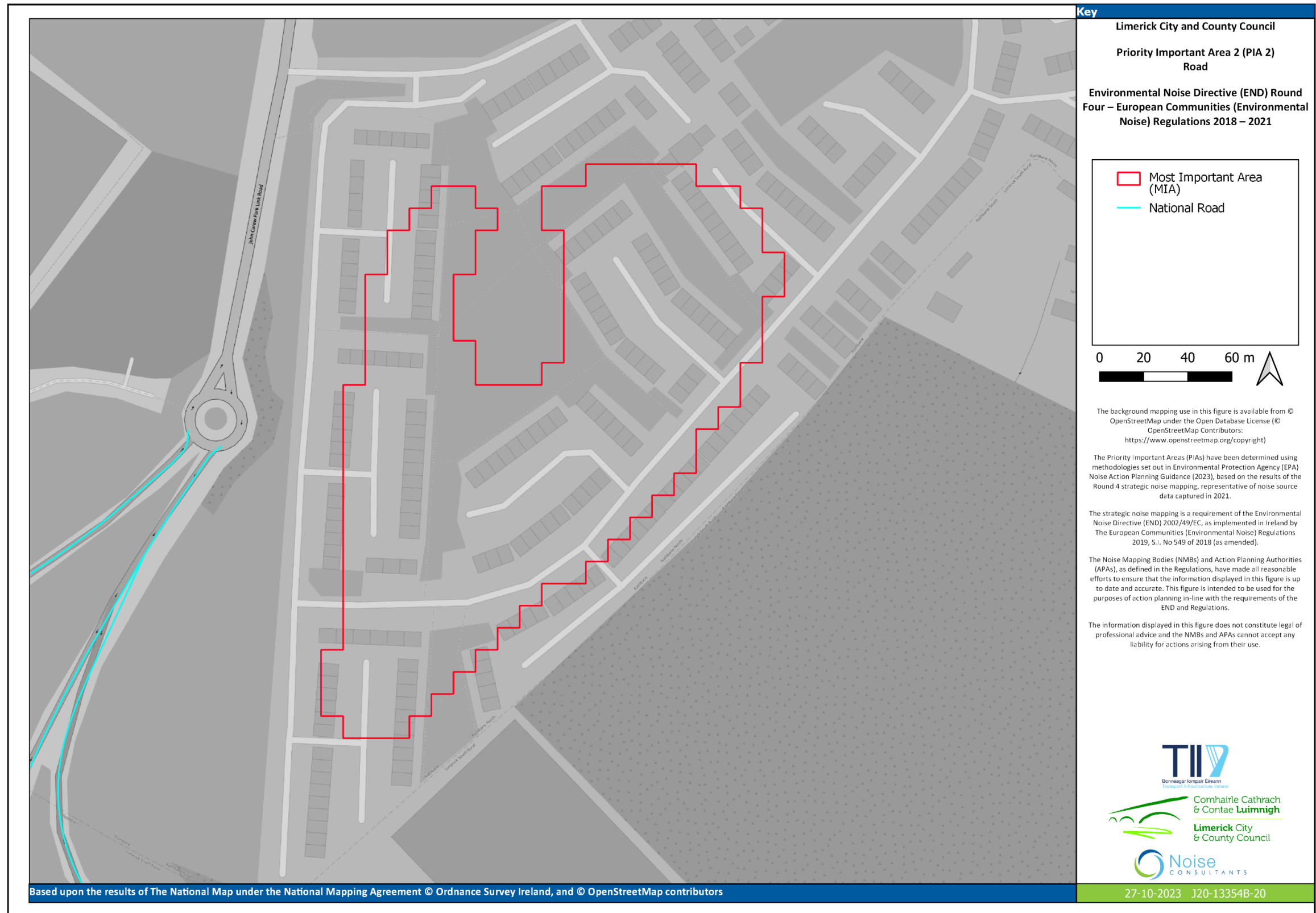


Figure E.3. Limerick City and County Council: Roads - Priority Important Area 2 (PIA 2) – John Carew Park.

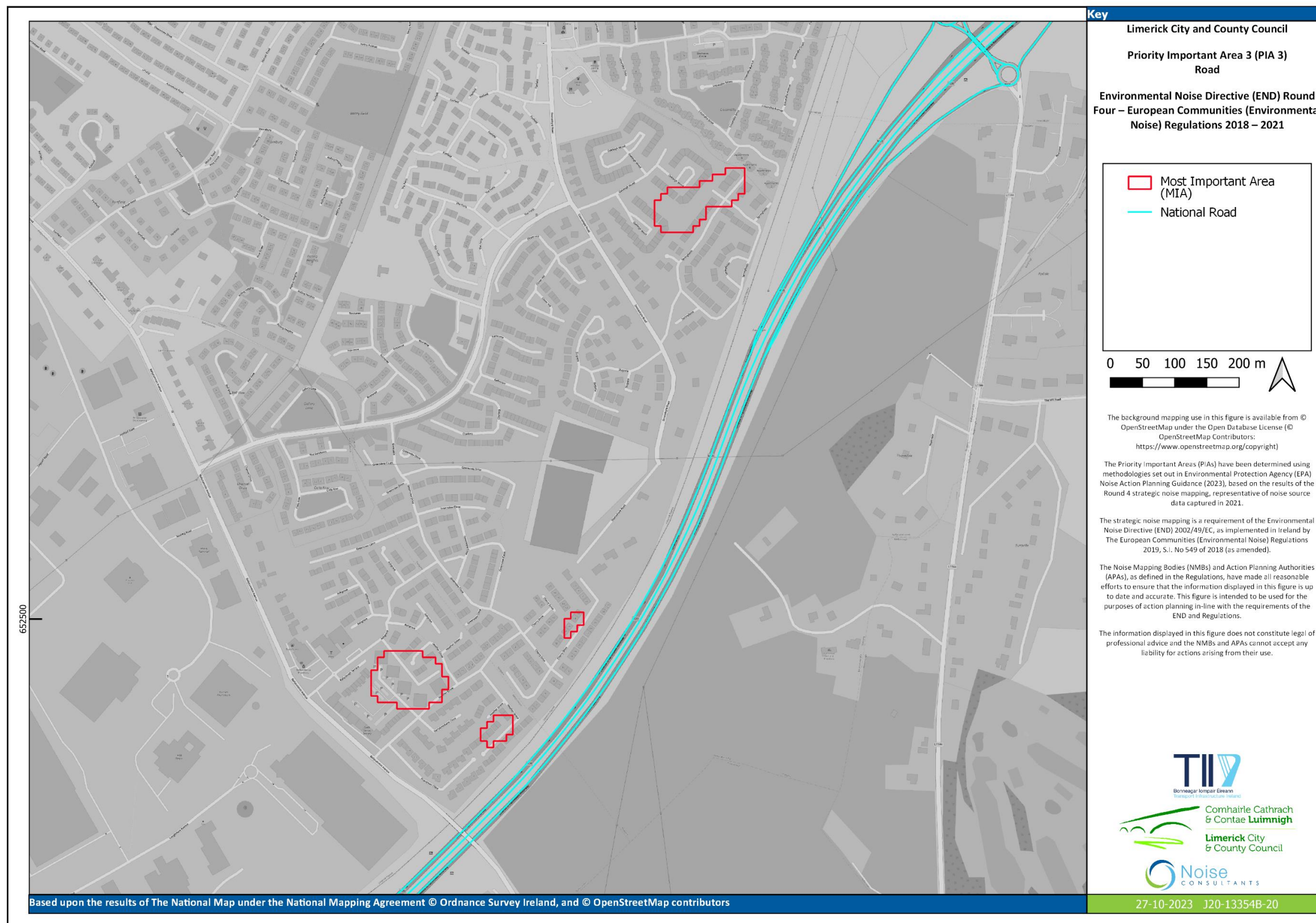


Figure E.4. Limerick City and County Council: Roads - Priority Important Area 3 (PIA 3) - Ballycummin.

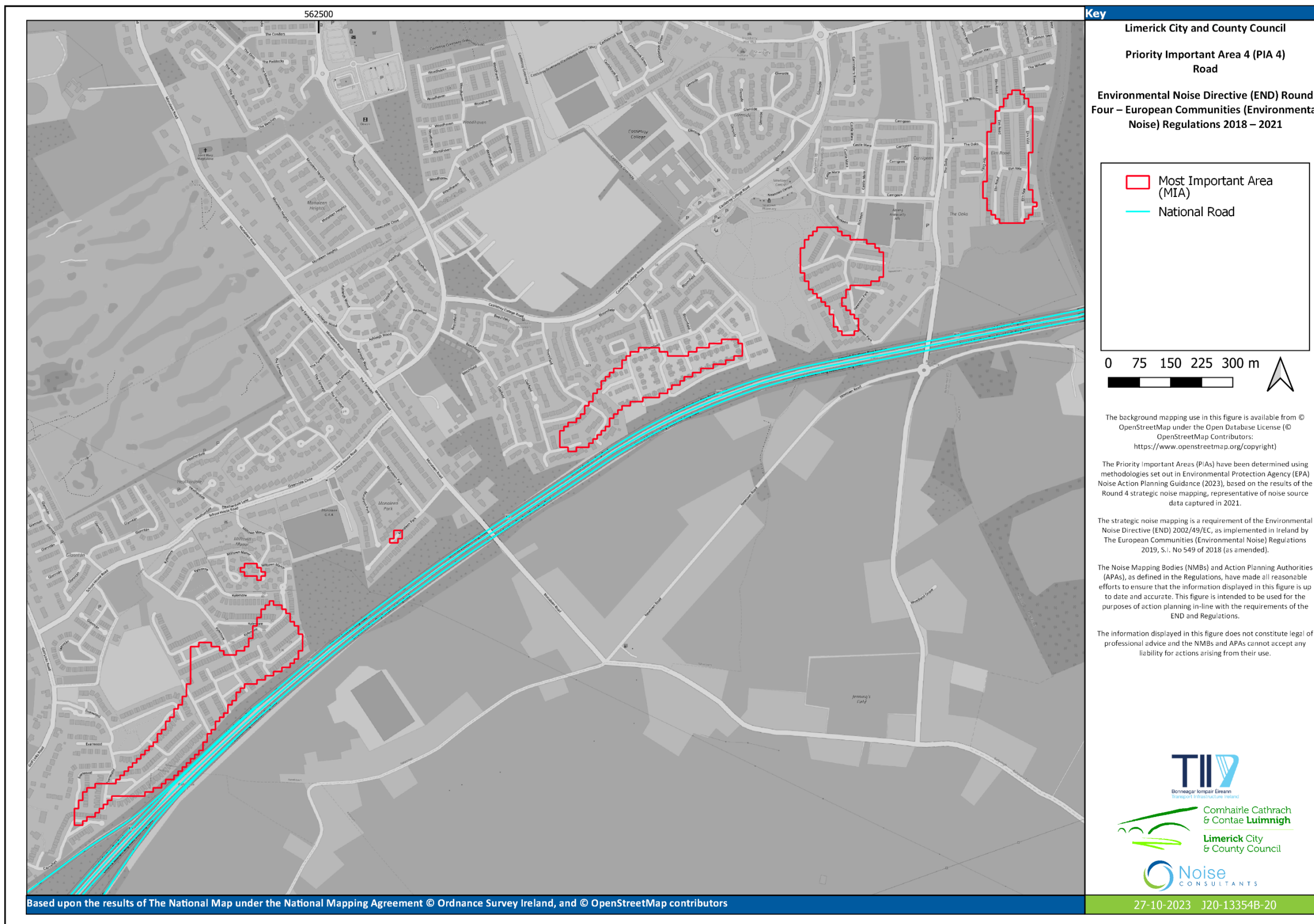


Figure E.5. Limerick City and County Council: Roads - Priority Important Area 4 (PIA 4) – Monaleen / Castletroy.

Appendix F: LSMATS Objectives

F.1 Introduction

Table F.1 is a summary of the objectives and measures in the Limerick Shannon Metropolitan Area Transport Strategy (LSMATS) that cover the period of the Strategy to 2040 that may influence the noise environment including opportunities and threats for the acoustic environment.

Table F.1. LSMATS objectives and measures along with potential opportunities and threats for the acoustic environment.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
WK1 Improvements to the Pedestrian Network	<ul style="list-style-type: none"> Develop a primary pedestrian network throughout Limerick City. Retrofit neighbourhood infrastructure to enhance walkability and attractiveness of walking. Lower traffic speeds to improve pedestrian safety in residential areas. 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage and traffic calming. Opportunities to implement green measures to improve acoustic environment.
WK2 Limerick City Strategic Pedestrian Projects	<ul style="list-style-type: none"> Upgrade the quality of the pedestrian environment in Limerick City Centre, including the pedestrianisation of selected City Centre streets. Secure improvements to the walking network in tandem with the implementation of BusConnects to prioritise multi-modal travel. 	<ul style="list-style-type: none"> Opportunities to implement green measures to improve acoustic environment. Potential to result in modal shift away from private vehicle usage. An increased frequency of buses (heavy vehicles) has the potential to increase noise levels if not supported by a significant move away from private vehicle use. Mitigation: reduced speed limits, traffic calming measures, modal shift.
WK5 Supporting Measures for Walking	<ul style="list-style-type: none"> Deliver permeability projects throughout urban areas which reduce the distance required to travel on foot to key destinations and to public transport services. In select locations, a package of permeability projects will be developed as part of local area plans or masterplans. Continue to implement behavioural change initiatives that promote walking provided through work places and schools, e.g. Smarter Travel, and initiatives such as Safe Routes to School and School Streets. 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage. Opportunities to implement green measures to improve acoustic environment.
CC1 Develop a Comprehensive Strategic Cycling Network	<ul style="list-style-type: none"> Build upon the existing Limerick Metropolitan Cycle Network Study to deliver a comprehensive cycle network for the LSMA; 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage and traffic calming. Opportunities to implement green measures to improve acoustic environment.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
CC1 (Cont.)	<ul style="list-style-type: none"> To deliver an integrated, fully connected high quality cycle network linking all major origins and destinations within the LSMA; Develop an Inter-Urban network connecting Limerick City and the Metropolitan town centres. Develop a high-quality cycle network within the Metropolitan Towns of the LSMA. Identify local opportunities for permeability and feeder routes to improve links to the primary, secondary and greenway network and enhance the attractiveness of cycling for short trips. Maintain and enhance existing infrastructure to a high standard. 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage and traffic calming. Opportunities to implement green measures to improve acoustic environment.
BC1 BusConnects Limerick	<ul style="list-style-type: none"> Conversion of public transport fleet to zero carbon vehicles. Changes to the service network to include: <ul style="list-style-type: none"> A 'branch and spine' network. Orbital routes. Additional Radial routes. Increased capacity and frequency. Demand Responsive Transport in locations where public transport patronage is low. 	<p>An increased frequency of buses (heavy vehicles) has the potential to increase noise levels if not supported by a significant move away from private vehicle use. Mitigation: reduced speed limits, traffic calming measures, modal shift.</p> <ul style="list-style-type: none"> If bus fleet decarbonised to electrified vehicles then potential for road noise to be reduced at low speeds.
BC2 O'Connell Street	<ul style="list-style-type: none"> Remove general traffic from O'Connell Street in order to eliminate delays to bus services, and to facilitate the redevelopment of Limerick City Centre by maximising accessibility to the core. 	<ul style="list-style-type: none"> Potential to reduce road noise along O'Connell Street.
BC3 Sarsfield Bridge	<ul style="list-style-type: none"> Examine the feasibility of removing general traffic from Sarsfield Bridge in order to reduce delays to strategic bus services from Clare, including Shannon Airport. and North West Limerick City 	<ul style="list-style-type: none"> Potential to reduce road noise at Sarsfield Bridge.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
BC4 Thomond Bridge and Shannon Bridge	<ul style="list-style-type: none"> Examine the feasibility of providing priority for bus services using Thomond and Shannon Bridge. 	<ul style="list-style-type: none"> Potential to increase road noise by increased speed of buses while gaining priority in advance of general traffic. Mitigation: reduced speed limits, traffic calming measures.
RL2 Dual Track from Limerick Colbert to Limerick Junction	<ul style="list-style-type: none"> Provide a dual track between Limerick Colbert and Limerick Junction to facilitate improved national and regional connectivity and improve service frequency in line with increased demand. 	<ul style="list-style-type: none"> Increased frequency of rail service has potential to increase rail noise for adjacent households. Mitigation: consideration of rail speeds in populated areas, acoustics barriers, implementing best practice measures.
RL3 Limerick Commuter Rail Network	<ul style="list-style-type: none"> Improve the frequency of services on the Ennis Rail Line to provide for an efficient and effective commuter rail service in the long-term. Examine the feasibility of providing the full commuter rail network for the LSMA, including the re-use of the Foynes and Mungret lines; a new line to Shannon; and new stations at appropriate locations integrated with high density Transit-Oriented Development. 	<ul style="list-style-type: none"> Increased frequency of rail service has potential to increase rail noise for adjacent households. Mitigation: assess rail noise as appropriate in environmental reports, consideration of rail speeds/ acoustics barriers in populated areas, implementing best practice measures.
RL4 Rail Freight	<ul style="list-style-type: none"> Reinstate the Limerick to Foynes railway line to provide a freight service. 	<ul style="list-style-type: none"> Reopening of line for rail freight has potential to increase noise in populated areas. Mitigation: assess rail noise as appropriate in environmental reports, consideration of rail speeds/ acoustics barriers in populated areas, implementing best practice measures.
RL10 Rail Lines and Greenways	<ul style="list-style-type: none"> Examine the feasibility of the provision of new greenways either within disused rail lines or immediately adjacent to existing or proposed rail corridors. 	<ul style="list-style-type: none"> Opportunities to implement green measures to improve acoustic environment. Development of greenways may tie into protection of the acoustic environment.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
LU1 Colbert Lands	<ul style="list-style-type: none"> Collaborate closely with Bus Éireann, Iarnród Éireann and the landowners such as the HSE and LDA, in maximising the development potential of the lands at Colbert Station 	<ul style="list-style-type: none"> Opportunities to implement green measures to improve acoustic environment.
LU2 City Centre Revitalisation	<ul style="list-style-type: none"> Support and facilitate the revitalisation of Limerick City Centre as the regional focus for economic, social and cultural activity and as a location for high density residential development. 	<ul style="list-style-type: none"> Opportunities to implement green measures to improve acoustic environment.
LU3 Principles for the Integration of Land Use and Transport Planning	<ul style="list-style-type: none"> Consolidate development into city, town, suburban and village centres in accordance with the 15-minute city and neighbourhood concept. Consolidate development around existing and proposed public transport services and facilities. Increase densities in future residential and employment developments. Prioritise mixed-use development which reduces the need to travel. Ensure that all new development areas will be fully permeable for pedestrians and cyclists through the application of the principle of filtered permeability whereby through traffic by private car is discouraged. Deliver schemes to improve permeability for walking and cycling in existing developed areas. Ensure that the layout of new developments will prioritise walking and cycling and enable the efficient provision of public transport services. 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage and traffic calming. Opportunities to implement green measures to improve acoustic environment.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
LU5 Walking and Cycling in Regeneration Areas	<ul style="list-style-type: none"> • Identify and deliver specific improvements to walking and cycling infrastructure in regeneration areas, based on those measures identified in the Regeneration Framework Plan, including: <ul style="list-style-type: none"> - Cycle tracks; - Greenways; - Opening up of new walking and cycling links to improve permeability within regeneration areas and between regeneration areas and surrounding neighbourhoods. • Cycle parking at retail outlets, public transport stops, and other services 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage. • Opportunities to implement green measures to improve acoustic environment.
LU8 Links to Moyross	<ul style="list-style-type: none"> • Significantly improve pedestrian and cycle accessibility at various points between Moyross and Cratloe Road. 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage and traffic calming.
LU9 Approach to Southill	<ul style="list-style-type: none"> • Upgrade Roxboro Road and the Roxboro Roundabout in order to cater for pedestrians, cyclists and public transport, and to better integrate Southill with areas to the north. 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage. • Opportunities to implement green measures to improve acoustic environment.
LU14 NTA Safe to School Programme	<ul style="list-style-type: none"> • Under our national Safe Routes to School programme prepare a programme of works aimed specifically at providing safe walking and cycling environments to schools in the LSMA, including: <ul style="list-style-type: none"> - School Streets. - School Zones. - Reduced Speed limits. - Park and Stride. • Additional cycle and scooter parking. 	<ul style="list-style-type: none"> • Potential to influence behavioural change and modal shift away from private vehicle usage. • Removal of vehicles from streets and reduced speed limits has the potential to reduce road noise.
UD1 Supporting Sustainable Mobility	<ul style="list-style-type: none"> • Reallocate road space in Limerick, Shannon and other Metropolitan Centres to prioritise walking, cycling and public transport use. • Manage the road network to discourage throughtraffic in built-up areas. 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage and traffic calming. • Opportunities to implement green measures to improve acoustic environment.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
UD1 (Cont.)	<ul style="list-style-type: none"> • Prioritise the placemaking functions of the urban street network in line with the hierarchy outlined in DMURS. 	
UD2 Traffic Management in Limerick City and Metropolitan Centres	<ul style="list-style-type: none"> • Manage the road network to discourage through traffic in built-up areas; • Undertake public realm improvements in Limerick City Centre in tandem with a City Centre Traffic Management Plan and the emerging City Centre Public Realm Strategy that are sensitive to their historic setting. 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage and traffic calming. • Opportunities to implement green measures to improve acoustic environment.
UD5 Reduced Speed Limits	<ul style="list-style-type: none"> • The implementation of speed limits of 30 kph in all residential areas and in urban centres and the incorporation of supporting design measures, where required. 	<ul style="list-style-type: none"> • Potential to reduce rolling noise from vehicles.
UD6 Low-Traffic Neighbourhoods	<ul style="list-style-type: none"> • Implement Low-Traffic Neighbourhoods in urban areas across the region. 	<ul style="list-style-type: none"> • Potential to reduce noise levels by reduced traffic volumes.
RS1 Road and Street Network	<ul style="list-style-type: none"> • Maintain, manage and operate the existing road infrastructure to support higher levels of public transport, walking and cycling. 	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage and traffic calming.
RS2 Supporting Sustainable Mobility	<p>Better manage the road network to protect the function of the strategic road network and to reduce the use of the private car for short journeys.</p>	<ul style="list-style-type: none"> • Potential to result in modal shift away from private vehicle usage and traffic calming.
RS3 Principles for the Provision of New Roads	<ul style="list-style-type: none"> • Subject to the feasibility and environmental assessment processes, including the full application of the Habitats Directive and all transposing legislation, new roads, where provided, will be developed in accordance with the principles and measures outlined in this chapter. 	<ul style="list-style-type: none"> • The harmful effects of road noise on the population should be assessed in proposals for new roads.
RS4 National Roads	<ul style="list-style-type: none"> • Retain and protect the strategic function of the National Road network. • Complete the appraisal process and deliver the N/M20 Cork to Limerick Scheme. 	<ul style="list-style-type: none"> • Identify and agree mitigation measures where road noise has the potential to cause harmful effects on the population.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
RS4 (Cont.)	<ul style="list-style-type: none"> Construct the N69/M21 Foynes to Limerick Road (including Adare Bypass) to TEN-T standard. 	<ul style="list-style-type: none"> The harmful effects of road noise on the population should be assessed in proposals for new national roads.
RS5 Addressing Regional Road Network Constraints	<ul style="list-style-type: none"> In association with the BusConnects programme, the identification and delivery of a project or projects, potentially including Park and Ride, behavioural change, and traffic management measures, to reduce car traffic crossing Athlunkard Bridge on the Corbally corridor. 	<ul style="list-style-type: none"> Potential to result in modal shift away from private vehicle usage and traffic calming. An increased frequency of buses has the potential to increase noise levels if not supported by a significant move away from private vehicle use. Mitigation: reduced speed limits, traffic calming measures, modal shift.
FDS1 HGV Restrictions	<ul style="list-style-type: none"> Identify specific lorry routes and/or time restrictions, to reduce peak-time HGV movements through Limerick City and neighbourhoods. 	<ul style="list-style-type: none"> Potential to reduce noise from HGVs in parts of the City at times that might cause annoyance (e.g. early morning). Consideration to impact of noise on households and quiet areas should be given to any specific routes for HGVs.
FDS2 Local Freight Management	<ul style="list-style-type: none"> Examine the feasibility of consolidation centres and break-bulk facilities outside of the National Road network in the medium-term, to facilitate smaller vehicles delivering to Limerick City Centre. 	<ul style="list-style-type: none"> Potential to reduce percentage of HGVs from freight in Limerick City Centre and reduce noise.
FDS4 Delivery and Servicing Strategy	<ul style="list-style-type: none"> Reduce the amount of ‘last mile trips’ being made by motorised vehicles. Facilitate the transition to zero-emission delivery vehicles such as cargo bikes, solar powered and electric vehicles. Support and secure the delivery of consolidation centres and break bulk facilities, which will facilitate smaller vehicles delivering to Limerick City Centre and other major town centres. 	<ul style="list-style-type: none"> Potential to reduce percentage of HGVs from freight in Limerick City Centre and reduce noise. If servicing freight is decarbonised to electrified vehicles then there is the potential for road noise to be reduced at low speeds.
SM2 Park and Rides	<ul style="list-style-type: none"> Implement a network of strategic Park and Ride facilities, served by high-frequency public transport services, and walking and cycling networks. 	<ul style="list-style-type: none"> Potential to reduce private vehicles in Limerick City Centre and reduce noise.

Objective / Measure	Relevant to Environmental Noise	Opportunities (blue)/ Threats (Red)
SM2 (Cont.)	<ul style="list-style-type: none"> Investigate the potential for local Park and Ride facilities at other locations such as Corbally. In the development of the Metropolitan bus and rail network, consider the impact of Park and Ride facilities which may be delivered outside the LSMA. 	
SM6 Smarter Travel Workplaces and Campuses	<ul style="list-style-type: none"> Expand the Smarter Travel Workplaces and Campuses Programme in order to directly influence travel behaviour in the LSMA and to maximise the use of public transport, walking and cycling infrastructure and services to be developed under the Transport Strategy. 	<ul style="list-style-type: none"> Potential to reduce private vehicles and reduce noise.

Appendix G: Round 4 NAP Implementation Actions

G.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 and CCC1.1: Noise Action Plan Working Group(s) - Action Planning Authorities and Noise Mapping Bodies

LCCC and CCC 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 and CCC will support the establishment of a National NAP Implementation Working Group.

Measures LCCC1.2 and CCC1.2: 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 and CCC 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 and CCC1.3: Report to the Environment Protection Agency (EPA)

LCCC and CCC 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 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 and CCC 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 and CCC1.4 Continued Investigation and Management of Complaints

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

Measures LCCC1.5 and CCC1.5: Stakeholder Collaboration

LCCC and CCC 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 and CCC1.6: 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.

G.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 and CCC2.1: 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 Active Travel Programme;
- the Limerick Shannon Metropolitan Area Transport Strategy;
- the Limerick City and County Council and Clare County Council Climate Action Plans.

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 and CCC2.2: Noise Sensitive Buildings

LCCC and CCC 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 and CCC will engage with relevant authorities and appraise noise mitigation options where feasible and recommend the most appropriate noise mitigation measure(s) if necessary.

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.

G.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 and CCC3.1: Planning Referrals

Relevant Sections in LCCC and CCC 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 and CCC3.2: Support the development of local authority policies and objectives

LCCC and CCC 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 and CCC3.3: Support the development of new public realm and green and blue infrastructure

LCCC and CCC 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 and CCC 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.

G.4 Protection – Noise Management Measures**Measures LCCC4.1 and CCC4.1: Evaluation of Candidate Quiet Areas (CQAs)**

LCCC and CCC will complete an evaluation of each of the CQAs. The objective of the evaluation process will be to confirm the validity of the CQA 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 and CCC4.2: 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 CQAs

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 Candidate Quiet Areas to measured acoustic parameters. LCCC will develop and implement a citizen science and soundscape approach to the investigation of the Candidate Quiet Areas.