Evaluation of Directive 2002/49/EC relating to the assessment and management of environmental noise

Final Report – Country Fiches

Second Implementation Review of the Environmental Noise Directive

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CONTENTS

1. INTRODUCTION / HOW TO READ THIS REPORT

This report contains the 28 country reports summarising the implementation of the END across the 28 EU Member States. The country reports are structured as follows:

1. National implementing legislation for END:

This section presents national legislation transposing the END and contains a tabular overview of the change in END coverage (expressed in terms of the *number* of agglomerations and airports as well as the *km* in length of major railways and roads) between Round 1 ("R1") and Round 2 ("R2"). These changes reflect the transition from the introductory threshold in R1 to the definitive END threshold applicable from R2 onwards:

Type of entity	Round 1 (2007-2012)	Round 2 (2013-2018) and thresholds for subsequent rounds
Agglomerations	> 250,000 inhabitants	> 100,000 inhabitants
Major airports	Civil airport, designated by the Member State, which has > 50,000 movements per year (a movement being a take-off or a landing)	Civil airport, designated by the Member State, which has > 50,000 movements per year (a movement being a take-off or a landing)
Major roads	> 6 million vehicle passages a year	> 3 million vehicle passages a year
Major railways	> 60,000 train passages per year	> 30,000 train passages per year

2. Competent Authorities and designated administrative bodies:

This section provides an overview of the different Competent Authorities ("CAs") in the country concerned and their responsibilities for preparing and approving SNMs and NAPs, as well as reporting to the European Commission ("EC"). The section includes a table listing all designated CAs under the END. It should be noted that other public authorities and wider stakeholders not listed in these tables may well play a role in END implementation, e.g. by collecting data or providing input under public consultation.

3. Designation and delimitation of agglomerations, major roads, major railways and major airports:

This section describes problems that may have occurred relating to the designation and delimitation of agglomerations, major roads, major railways and major airports, which is an indispensable preparatory step before producing Strategic Noise Maps ("SNMs") for these areas and sources.

4. Noise limits and targets:

This section highlights any national legal noise limits or targets. Although there are no common EU-wide Limit Values in the Directive itself, most but not all MS have put in place mandatory noise limits at national level, whose exceedance generally leads to sanctions, or whose potential exceedance blocks the operation of installations (such as new roads, railways, or industry). Noise targets are values whose exceedance demands the consideration of action to reduce noise. This section also reports as to whether the exceedence of noise limits is being legally enforced, and on related implementation issues. Noise limits are examined since they play a role in the END's implementation, even though they aren't addressed in the Directive, for instance, in identifying priorities for noise action planning.

5. Quiet areas:

This section describes how quiet areas are defined in national transposing legislation, and mentions whether quiet areas have been designated in a particular Member State ("MS") to date, along with any associated implementation issues.

6. Strategic noise mapping:

This section presents the state of play in terms of the production of SNMs in each EU MS, as mandated by the END. First, a tabular overview of the number of SNMs produced in each Round is presented. The figures refer to the number of SNMs formally adopted. Where this information was available, the number of SNMs *originally envisaged* is figures provided in brackets as contextual information. An analysis of completeness by noise source at EU level is provided in section 2 of the Main Report. Where brackets are missing, this does not indicate that reporting submissions are complete, but simply that information on the number of SNMs originally envisaged was not available.

It should be noted that whereas the completeness data in the main body of the report is based on official data as reported to the EC by the EU MS against what was originally meant to be reported, the data contained in the country reports is self-reported data by each MS national competent authority ("CA"). In many cases, the data will be the same in both cases, whereas in some cases, there may be discrepancies. These may be explained by a range of factors:

- *Different calculation methods* (e.g. whilst in case of agglomerations, the EEA data calculates the number of Strategic Noise Maps (SNMs) based on the number of agglomerations, in some Member States the number of SNMs may be higher than the number of agglomerations within END scope due to several maps being produced *within* agglomerations for various sources).
- *Different cut-off dates*: Whilst the EEA data analysed in the implementation review in the main body of the report dates back to November 2015, the bottom-up data collection was carried out in June 2015. Where possible, later information was taken into account.
- *Different interpretations of the data*: whereas the EEA counts the number of SNMs and NAPs reported to the EC, the data presented in this country report refers to the number of SNMs and NAPs *formally adopted* in the country, with the number of SNMs and NAPs *expected* (based on the END coverage and what Competent Authorities communicated to the EEA/EC) presented in brackets to allow for comparison.
- *Different levels at which information is aggregated and presented*: Whereas the EEA data reports on noise sources within agglomerations *separately* for major roads, railways, and aircraft noise, the information presented in this country report covers completeness in terms of agglomerations *overall*.

The section goes on to discuss responsibility and methodologies used for data collection for SNMs, and the availability of data. The section also describes the extent to which SNMs are publically available, providing weblinks where applicable. Finally, the section highlights any implementation issues in R1, how these have been addressed in Round 2, and whether any new issues occurred in R2.

7. Noise action planning:

This section presents the state of play in terms of the production of Noise Action Plans ("NAPs") in the country, as mandated by the END.

Firstly, a tabular overview of the number of NAPs produced in each Round is presented. It should be noted that similar presentational issues and limitations apply as outlined above in case of SNMs with regard to the comparability of the information presented with the analysis carried out in the implementation review in the main body of the report. This means that where brackets are missing, this does not indicate that reporting submissions are complete, but simply that information on the number of NAPs originally envisaged was not available.

The section goes on to examine methodologies used for action planning purposes, as well as a description of measures included in the NAPs, and an assessment of whether these have been implemented in practice. The section also describes the steps undertaken to consult with the public on NAPs, and any implementation issues in Round 1, how these have been addressed in Round 2, and whether any new issues occurred in Round 2.

It should be noted that wherever a table cell contains the words 'no data' this means that it was not possible to obtain the relevant information either through own research or by the Competent Authorities. Wherever a table cell contains the value 'n/a' this means that this is not applicable. In the example below this means that no agglomerations were within END scope in Round 1 in the country in question.

	R1
Agglomerations	n/a

GLOSSARY OF ABBREVIATIONS, TERMS AND DEFINITIONS

A glossary and definition of acronyms, abbreviations and technical terms is provided below:

Abbreviations and acronyms	Full wording
Art.	Article in an EU legal text
CAs	Competent Authorities
CNOSSOS-EU	Common Noise Assessment Methods in Europe. This will be used for the purpose of strategic noise mapping.
DALYs	Disability-Adjusted Life Years
ETC/ACM	European Topic Centre on Air Pollution and Climate Change Mitigation
END	The Environmental Noise Directive - Directive 2002/49/EC.
ERFs	Exposure-response functions
HA	Highly Annoyed
ICAO	International Civil Aviation Organization
JRC	Joint Research Centre
LV(s)	Limit Value(s)
NAPs	Noise Action Plans
SNMs	Strategic Noise Maps
WHO	World Health Organisation

Technical terms/ definitions	Description
Action Planning Body	An organisation nominated in the capacity of a CA responsible for producing a Noise Action Plan.
Agglomeration	Agglomeration' shall mean part of a territory, delimited by the Member State, having a population in excess of 100000 persons and a population density such that the Member State considers it to be an urbanised area. However, it should be noted that in R1, an agglomeration was an area with a population in excess of 250,000 persons as part of a transitional period.
Major airports	A civil airport with >50000 movements per year (a movement being a take-off or a landing).
Major railway	'Major railway' shall mean a railway, designated by the Member State, which has more than 30 000 train passages per year. Note: Major railways in R1 were defined as > 60000 train passages per year and in R2, the threshold changed to > 30000 train passages per year.
Major roads	'Major road' shall mean a regional, national or international road, designated by the Member State, which has more than 3 million vehicle passages a year; Note - major roads in R1 were defined as a road with > 6 million vehicle passages a year. In R2, the threshold was changed to > 3 million vehicle passages a year.
NRA	National Road Authority
R1/ Round 1	The noise mapping which took place in 2007 and the subsequent adoption of Action Plans in 2008 onwards.
R2/ Round 2	The noise mapping which took place in 2012 and the subsequent adoption of Action Plans in 2013 onwards.
R3/ Round 3	The noise mapping that will take place in 2017 and the subsequent Action Plans that will be prepared in 2018. There will be a transition in some countries towards the use of CNOSSOS-EU (voluntary only).
R4 / Round 4	The noise mapping that will take place in 2022 and the subsequent action plans that will be prepared in 2023. The use of CNOSSOS-EU will be mandatory.

Technical terms/ definitions	Description
TFEU	Treaty for European Union, the Lisbon Treaty, adopted in December 2009.

A list of some of the acoustical and technical terms used in the report for the benefit of non-technical readers is provided below:

Technical term	Explanation/ description
A 'common approach'	The term 'a common approach' is used in the report as shorthand when referring to Article 1(1) of the END whose full aim is to "define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise".
Annoyance	One of the health endpoints mentioned in the current WHO guidelines for quantifying the burden of disease from environmental noise. The WHO defines annoyance as an emotional state connected to feelings of discomfort, anger, depression and helplessness.
Cardiovascular diseases	One of the health endpoints mentioned in the current WHO guidelines, includes minor changes in cardiovascular activity and myocardial infarction.
Competent Authority	The organisation nominated as being responsible either for the development of Strategic Noise Map(s), Noise Action Plans or both.
Disability-Adjusted Life Years (DALYs)	One DALY represents one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation.
Dose-effect relationships	The END describes this as meaning "the relationship between the value of a noise indicator and a harmful effect". This also describes the change in effect on exposed population caused by differing levels of exposure (or doses) to noise (measured in dBs) after a certain exposure time.
EIONET	European Environment Information and Observation Network
Health endpoints	Examples of health endpoints mentioned in the current WHO guidelines are: annoyance, sleep disturbance and cardiovascular diseases.
Reportnet	The EEA's reporting mechanism for gathering data and information on END implementation through the EIONET network of Member State authorities. https://www.eionet.europa.eu/reportnet
Sleep disturbance	Sleep disturbance is a further health endpoint mentioned in the current WHO guidelines, includes EEG awakening, motility, changes in duration of various stages of sleep, sleep fragmentation, waking etc.
Noise metrics	*There are two key indicators that are used in implementing the END, L_{den} and L_{night}. Definitions of these terms are provided below:*
L_{den}	'L_{den}' (day-evening-night noise indicator) shall mean the noise indicator for overall annoyance, as further defined in Annex I of the END.

Technical term	Explanation/ description
L_{night}	L_{night}' (night-time noise indicator) shall mean the noise indicator for sleep disturbance, as further defined in Annex I of the Directive;
TSIs	Technical Standards for Interoperability – voluntary standards in the rail sector.

2. AUSTRIA

2.1 National implementing legislation for END

2.1.1 Legal implementation

The implementing legislation for the END at national level in Austria is the Federal Law on Protection from Environmental Noise (*Bundes-Umgebungslärmschutzgesetz, BGBl. I 60/2005*), which entered into force on 5th July 2005[1]. A Federal Ordinance on Protection from Environmental Noise (Bundes-Umgebungslärmschutzverordnung, BGBI. II Nr. 144/2006)[2] of 5th April 2006 provides clarification on technical details related to noise indices, Strategic noise mapping, Noise action planning, and the definition of agglomerations.

The division of competences for END implementation across the country's nine Federal States has resulted in additional legal acts that enact END measures in each of these states[3].

2.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Austria included a single agglomeration (Wien) and airport (Wien), and approximately 2,453 km of major roads and 604 km of major railways.

The introduction of definitive thresholds in R2 mean that an additional 4 agglomerations were included within the scope of the END, and meant an expansion in coverage of major railway lines by 1,410 km and of major roads by 2,858 km.

Table 1 END coverage – Austria

Round	Agglomerations	Major airports	Major rail	Major roads
1	1	1	604 km	2,453 km
2	5[4]	6[5]	2,014 km	5,311 km

[1] Bundesgesetz 60/2005; Official Journal: Bundesgesetzblatt für die Republik Österreich (BGBl.), Nr. 60/2005, Publication date: 04.07.2005, Entry into force: 05.07.2005; Reference: (MNE (2005)52738).

[2] Verordnung des Bundesministers für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft über die Methoden und technischen Spezifikationen für die Erhebung des Umgebungslärms (Bundes-Umgebungslärmschutzverordnung – Bundes-LärmV), 144. Verordnung, Publication date: 5. April 2006, BGBl. II - Nr. 144.

[3] For a full list of the legislative acts please see:
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:72002L0049:EN:NOT#FIELD_AT

[4] Wien, Graz, Innsbruck, Linz, Salzburg

[5] Wien, Graz, Linz, Innsbruck, Salzburg, Klagenfurt

2.2 Competent Authorities and designated administrative bodies

An overview of the different administrative responsibilities for the END in Austria is shown in the table below.

Table 2 Administrative Responsibility for the END - Austria

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Federal state authorities	BMVIT (assisted by ASFINAG or federal state authority)	BMVIT (assisted by ÖBB or federal state authority)	BMVIT
Approving SNMs	Federal Ministry for Transport, Innovation and Technology (BMVIT)	BMVIT	BMVIT	BMVIT
Preparing NAPs	Federal state authorities	BMVIT (state roads) and Federal state authorities (federal state roads)	BMVIT (railways) Municipalities (trams)	BMVIT

ASFINAG: Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft / Highway Financing Listed Company
ÖBB: Österreichische Bundesbahnen / Austrian Railways

The Federal Ministry of Agriculture, Forestry, Environment and Water Management (*BMLFUW*) has overall responsibility for national implementation of the END, in accordance with Article 14 of the Federal Law on Protection from Environmental Noise. Responsibility for the development of SNMs and NAPs is split vertically across sectors and geographically (horizontally) as per Articles 6 and 7 of the law mentioned above. The Federal Ministry for Transport, Innovation and Technology (*BMVIT*) is responsible for Strategic noise mapping and Noise action planning for major roads, major railways and major airports (including those within agglomerations).

SNMs and NAPs for agglomerations are developed by the relevant regional authority and then submitted to the BMVIT. Both SNMs and NAPs also include noise from tramlines that fall within agglomerations. The Federal Ministry for Economics and Labour (*BMWA*) is responsible for some sections of SNMs and for the plans that capture installations sited within agglomerations regulated by the IPPC Directive[6] in cooperation with the *BMLFUW*. All SNMs and NAPs are then collected by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management *(BMLFUW)* and made available to all the above ministries and the public.

In addition, Austria has set up a Working Group for Controlling Noise (*Österreichischer Arbeitsring für Lärmbekämpfung,* OÄL) to address issues related to noise from an interdisciplinary perspective. The group, which was established in 1958, is responsible for generating guidance and expert opinions on all aspects of environmental noise control from individual and multiple sources. ÖAL developed the directive ÖAL-Richtlinie Nr. 36 Blatt 2 providing guidance on the preparation of SNMs and planning of noise abatement measures[7].

[6] Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC)

[7] See: http://www.oeal.at/

2.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

2.3.1 Data collection

The Austrian authorities did not experience any problems in either Round in terms of obtaining data for the designation and delimitation of agglomerations, major roads, major railways and major airports.

2.3.2 Implementation Issues

The only issue raised in R1 was the difficulty of mapping noise in border areas. For example, noise levels in agglomerations may be affected by noise from sources in another, adjacent administrative region (the same applies to national borders where agglomerations are located near them). In these cases, data on the noise from sources across the administrative border has to be requested from other administrative authorities. At times, such data is not readily available at the time when noise maps are developed. This problem likely persists in Round 2. No remedial action has been identified, and no additional issues were raised in R2.

2.4 Noise limits and targets

2.4.1 Objectives and Scope

The main objective of noise limits is the protection of the general public against noise from traffic and industry. Due to the various regulations, competencies and interests, a comprehensive approach resulting in equal protection from the various noise sources is anticipated. Preventive measures against road traffic noise only apply in case of major road reconstructions and new roads. For railways, a modernisation scheme is available which contributes to meeting the set limit values.

Although there is no requirement in the END to set noise limit values, national legislation in Austria does so. The table below provides a summary of noise limit values in force applied under the Instructions on Noise from Federal Roads (Dienstanweisung Lärmschutz an Bundesstraßen, BMwA No. 890.040/2-VI/14a/99) and the Ordinance for the Control of Rail Noise Pollution (Schienenverkehrslärm-Immissionsschutzverordnung, SchIV, BGBI No. 415/1993). The Instructions on Noise from Federal Roads apply to existing and new highways and expressways built anywhere in the country. The Ordinance for the Control of Rail Noise Pollution applies to new construction as well as the substantial reconstruction of routes throughout the federal territory.

Table 3 Noise limit values - Austria

L_{night} 22:00-06:00hr	L_{day} 06:00-22:00hr	Relevant legislation
50	60	Instructions on Noise from Federal Roads, (BMwA number 890.040/2-VI/14a/99)
55	65	Ordinance on Rail Noise Pollution Control Regulation (SchIV)

Protection against air traffic noise is not regulated to date. The BMVIT has issued a draft regulation LuIV (Luftverkehr-Immissionsschutzverordnung) that currently is under review.

In addition, noise threshold values in relation to environmental are determined in the Federal Ordinance on Protection from Environmental Noise (Bundes-LärmV):

Table 4 Noise threshold values - Austria*

L_{night}	L_{den}	Noise Source
50	60	Road traffic noise
55	65	Air traffic noise
60	70	Rail traffic noise
50	55	Industry and trade noise

** Values can differ between federal states*

Planning values and noise emission limit values are defined in the ÖNORM S 5021 for various area categories. Planning values are derived from the dedication category of the area with a range of 45 - 65 dB day / 35 - 55 dB night. The planning values of the federal states may differ from the values in the ÖNORM S 5021[8].

2.5 Quiet areas

2.5.1 Overview

No quiet areas were established in R1. They are defined in the Federal Law on Environmental Noise. According to this Law, they are supposed to be part of the NAPs "if applicable".

In R2, the agglomeration Vienna defined 10 quiet areas within the municipal boundaries. These areas represent existing protected areas such as national parks, nature reserves and landscape conservation areas.

Article 9 of the Federal Ordinance on Protection from Environmental Noise requires the identification of quiet areas in NAPs, and the inclusion of measures to protect quiet areas in cases where noise limit values are being transgressed.

Quiet areas are defined in Article 3 of the Federal Law on Protection from Environmental Noise as: "*areas that on the basis of their designation exhibit a particular need for protection with regard to environmental noise, in connection with a suitable noise index".* There is no specific distinction between quiet areas in agglomerations and open country.

Quiet areas within agglomerations are identified on the basis of the noise index L_{den}.

There is no national level methodology for defining quiet areas.

In the federal state of Vienna, quiet areas are defined in the Vienna Environmental Noise regulation (*Wiener Umgebungslärmschutzverordnung*) to mean protected areas where the noise threshold value of L_{den} = 50 dB and L_{night} = 40 dB is not exceeded (excluding air traffic noise).

2.5.2 Implementation Issues

No issues were raised as a result of END implementation in either Round.

[8] A comprehensive overview is provided in: „Handbuch Umgebungslärm, Minderung und Ruhevorsorge ", IG Umwelt und Technik, BMVIT

2.6 Strategic noise mapping

2.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown below. SNMs for Austria are published at *www.laerminfo.at* in three different maps: Roads (including agglomerations), Railways and Airports. A SNM for Vienna is available from: http://rigolett.home.xs4all.nl/ENGELS/maps/wien.htm

Table 5 – SNMs – Austria

	R1	R2
Agglomerations*	1	1 (5)
Major airports	1	1 (1)
Major railways	1	1 (2,014 km)
Major roads***	2	2 (5,311 km)

** No separate maps – agglomerations incorporated in the maps for major roads, and for trams and metro lines*

*** no map available online*

**** 1 map for federal roads, 1 map for state roads*

2.6.2 Data collection

Responsibility for data collection lies with the authority responsible for generating the relevant section of a SNM. In order to ensure clarity as to which authorities were responsible for generating (collecting) data, working areas for road traffic have been divided up between the relevant administrative authorities given administrative boundaries which are independent of competence over specific stretches of road.

The table below describes data availability and collection over the two Rounds.

Table 6 Strategic noise mapping – data availability and collection methods - Austria

R1	R2
New data collection exercises on a case-by-case basis, in particular for major federal roads (as geographical data is not always up to date).	Collection of data was undertaken using the same methodology
Correlation of population census with geo-referenced address details for data on buildings	

2.6.3 Strategic noise mapping methods

Detailed technical specifications for Strategic noise mapping are set out in Article 5 of the *Federal Ordinance for Noise Protection*. In addition, Guidance documents on Strategic noise mapping were developed at the national level by the OAL. These are available at:

www.laerminfo.at/dms/laerminfo/massnahmen/publikationen/oal_richtlinien/oeal_richtlinie_nr_36_blatt_2.pdf

Although only L_{den} and L_{night} indices are used for SNM development, they are also used for specific applications, for example in the implementation of legislation to control noise from railways, namely the Federal Ordinance for the Protection of Noise from Trams (*Schienenverkehrslärm-Immissionsschutzverordnung,* BGBl. Nr. 415/1993). These are defined in Article 3 of the Federal Ordinance for Noise Protection, following ISO 1996-2:1987, with a measurement time of one year, and include $L_{evening}$ (19:00-22:00hr), L_{day} (06:00-19:00hr) and L_{night} (22:00-06:00hr).

2.6.4 Public accessibility of SNMs

SNMs are accessible via a website presenting source-specific maps (major roads, railways, trams and one major airport, and IPPC installations) which display at multiple scales and include a zoom function. Precise addresses may also be entered. SNMs also incorporate noise for tramlines into maps for agglomerations.

Quiet areas, in agglomerations and open country, are not made explicit on maps.

Pages on SNMs form part of a larger website established by the *BMLFUW* (http://www.laerminfo.at) to provide comprehensive information on noise regulation, and specifically on the processes for Strategic noise mapping and NAP development. A number of publications are available on the website, aimed at making information available to the public in a concise and accessible format. SNMs do not currently compare the existing situation against a future prognosis.

2.6.5 Implementation Issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and new issues from R2.

Table 7 Strategic noise mapping issues - Austria

R1	R2
Data collection using geo-data	Approved concept of data collection from R1 was refined and carried out without major problems
Obtaining data on exposed populations and number of dwellings, schools and hospitals exposed to specific noise indicator values, in particular number of inhabitants per building, location of existing noise protection walls and protection measures.	Data collection methodology from R1 was refined to be best practice.
Bridges could only be represented as 2D objects (in maps).	Existing fragmented data was reprocessed to design a consistent database of the ÖBB railway network for Strategic noise mapping.
Process slowed down by the need for multiple meetings due to competence split (federal state (local) authorities: tramlines; BMVIT major roads, major railways and major airports)	This remains an issue.
Defining responsibilities and determining the depth of the work, in terms of required level	This is no longer an issue since the level of detail was kept the same in R2.

R1	R2
of detail	
Lack of central point for the collection, management and administration of relevant data	This remains an issue.
5-year revision period considered too short (7 – 10 years would be preferable)	This remains an issue.

2.7 Noise action planning

2.7.1 Overview

An overview of NAPs is shown in the following table.

Table 8 – NAPs – Austria[9]

	R1	R2
Agglomerations	1	5 (6)
Major airports	1	5 (6)
Major railways	9	5 (5)
Major roads	2	9 (9)

** For all envisaged NAPs public consultation was completed in 2013 (except for 2 NAPs for main roads which were completed in 01/2015 and 04/2015)*

2.7.2 Methodologies for noise action planning

National guidelines have been developed for noise action planning in Austria by the OAL and combined with those for Strategic noise mapping. These set out a systematic approach to the preparation of NAPs and their required content. In addition, the *BMLFUW* has developed guidance -" *Handbuch Umgebungslaerm, Laermminderung und Vorsorge"*, available via its website *www.laerminfo.at*.

2.7.3 Measures

Measures in the R1 and R2 NAPs include: technical measures at source, the reduction of excessive noise, traffic planning, land-use planning, economic measures, noise isolation and mention of the contribution of measures required under national noise regulations. Additional measures include the installation of low-noise street surfaces and noise protection measures in residential buildings. The criteria for the selection of measures include population exposure, the implementation costs / ease of implementation, the need for flexibility in measure implementation and a check to ensure compatibility with other legislation.

SNMs were used to assess the effectiveness of existing noise protection measures for the reduction of noise from railways under the Ordinance for the Protection from Noise from Railways. The objectives and measures of such pre-existing and ongoing programmes for noise control have been integrated into NAPs developed under the END.

[9] Action Plans: As reported to the EC. And www.laerminfo.at

2.7.4 Public consultations

The OAL provides guidance on the provision of information to the public and their participation in the development of measures to address noise[10]. It emphasises timely engagement with the public and encourages the use of a range of materials to publicise information, including: community leaflets, mailings, posters, internet, radio and television.

NAPs are made available on:
http://www.laerminfo.at/massnahmen/aktionsplaene.html

Recommended procedures include establishing a process manager, delivering appropriate information work to ensure that all residents have the opportunity to learn from this procedure; giving at least 6 weeks for the population to give an opinion; respecting the requirements of population groups with special needs, such as disabled, elderly and infirm persons, persons with an immigrant background, children, etc.; publicising results. The guidance also considers the value of a roundtable approach to public consultation, but notes that such an approach generally takes up to a year.

The above stakeholder consultation process is managed by:

- Highways, railways and airports: *BMVIT* (*BMLFUW*),
- Other roads and agglomerations: federal state governments.

In R1 SNMs and actions plans were issued almost at the same time making public participation as required by END difficult. In Vienna no public consultation was carried out; only the heads of the Viennese districts were invited to participate in the process.

In R2 a comprehensive public consultation process was strived for. Citizens and organisations were invited to comment on the various NAPs. Public information was provided through the internet page *www.laerm.at*.

2.7.5 Implementation Issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and new issues from R2.

Table 9 Noise action planning issues - Austria

R1	R2
(There is a) lack of (adequate) human and financial resources	No data
SNM detail is insufficient to allow CBA of individual measures	No data
Division of competences between multiple regional and sectoral authorities is a major barrier to planning measures to control noise emissions	This remains an issue.
5-year revision period too short (7 – 10 preferable)	This remains an issue.

[10] OAL Richtlinie No. 36, available at:
www.laerminfo.at/dms/laerminfo/massnahmen/publikationen/oal_richtlinien/oeal_richtlinie_nr_36_blatt_1.pdf

3. BELGIUM

3.1 National implementing legislation for END

3.1.1 Legal implementation

The END was transposed into national legislation in Brussels and Walloon in 2004, and in Flanders in 2005.

Table 10 END transposition by region – Belgium

Region	Transposing Legislation
Brussels	Order of 1 April 2004 amending Order of 17 July 1997 regarding the fight against noise in urban areas
Flanders	Decree of 22 July 2005 on the evaluation and management of environmental noise
Wallonia	Order of 13 May 2004 regarding the evaluation and management of environmental noise

3.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Belgium included 3 agglomerations, 1 airport, and approximately 2,946 km of major roads and 416 km of railways. The introduction of definitive thresholds for R2 led to an *additional* agglomeration being covered. Information on major railway lines and major roads had not been reported to the EC by August 2014. Flanders reported information on major railway lines, major roads, major airports and major agglomerations on Eionet for R2 on 26th of May 2009 (Dataflow 5, http://cdr.eionet.europa.eu/be/eu/noise/df5/), and updated this information on the 16th of June 2014 for the major agglomerations and major roads. An update for major airports and railway lines was not deemed necessary as 2009 information was still valid. In case of Brussels, noise for all transport modes was covered within the scope of the Brussels region.

Table 11 END coverage – Belgium

Region	Round	Agglomerations	Major airports	Major rail	Major roads
Belgium	**1**	3	1	416 km	2,946 km
	2	6	1	1,336 km	5,024 km
Brussels	1	Brussels region (all transport modes)	n/a	n/a	n/a
	2	Brussels region	n/a	n/a	n/a
Flanders	1	2[11]	1	286 km	1,886 km

[11] Antwerp, Ghent

Region	Round	Agglomerations	Major airports	Major rail	Major roads
	2	3[12]	1	689 km	3,872 km
Wallonia	1	n/a	n/a	130 km	1,060 km
	2	2[13]	n/a	647 km	1,152 km

3.2 Competent Authorities and designated administrative bodies

The IBGE (Institut Bruxellois pour la Gestion de l'Environnement) [Brussels], The Flemish Environment, Nature and Energy Department – Air, Nuisances, Risk management, Environment and Health Division [Flanders] and The Service Public de Wallonie are Belgium's CAs.

Administrative responsibility for the implementation of NAPs has not been determined in Flemish legislation. Some administrative bodies also have advisory responsibility for the preparation and approval of NAPs. The details are described in the following document (for which no English version is available): http://emis.vito.be/sites/emis.vito.be/files/legislation/migrated/sb150108-5.pdf

The responsibilities of these and other bodies within regions are shown in the table below.

Table 12 Administrative Responsibility for the END - Belgium

Role/Activity	Agglomerations	Roads	Railways	Airports
Brussels				
Preparing SNMs	Institut Bruxellois pour la Gestion de l'Environnement (IBGE)			
Approving SNMs				
Preparing NAPs				
Approving NAPs	IBGE and Brussels Region Government			
EC/EEA reporting	Institut Bruxellois pour la Gestion de l'Environnement (IBGE)			
Flanders				
Preparing SNMs	City Authorities, Roads and Traffic Agency, Environment, Nature and Energy Department			
Approving SNMs	The Government of Flanders			
Preparing NAPs	Authorities, Roads and Traffic Agency, Environment, Nature and Energy Department			
Approving NAPs	The Government of Flanders			
EC/EEA reporting	Environment, Nature and Energy Department			
Wallonia				

[12] Antwerp, Ghent, Bruges

[13] Charleroi, Liège

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Service Public de Wallonie			
Approving SNMs				
Preparing NAPs				
Approving NAPs				
EC/EEA reporting	The Walloon Government			

3.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

3.3.1 Data collection

An overview of designation is shown in the following table.

Table 13 END designation by region – Belgium

Region	Description
Brussels	Data was obtained through collaboration and conventions (most already decided upon before Directive 2002/49/CE) with the different transport administrators. The Bruxelles-Capitale Region is an agglomeration. All data (buildings, transport, infrastructure characteristics) was mapped as much as possible. Information on the annual volume of traffic for major roads was given to the IBGE by the Administration of Equipment and Mobility (AED), information on the volume of traffic for major railways was provided by SNCB (national railway company) and information on public transportation was provided by STIB (Brussels public transport organisation)
Flanders	The Environment, Nature and Energy Department is responsible for the collection of data for END site designation. Information on the annual volume of traffic for major roads is delivered by the Roads and Traffic Agency and on major railways was provided by the national railway company. For the delimitation of major agglomerations, the Flemish authority used the borders of administrative municipalities.
Wallonia	During R1, it was reported that information was available for the 2005 designation process and that no major problem was encountered when increasing the scope of sites for reporting in 2008. Indeed, in the Walloon Region, there are no major airports and only two major agglomerations (Liège and Charleroi) according to the END definitions. The Walloon government designated areas for noise planning based on the recommendations of the Working Group Assessment of Exposure to Noise (WGAEN).

3.3.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 14 Designation issues - Belgium

Region	R1	R2
Brussels	Data collection was problematic since transport administrators were used to reporting on traffic data, but had no experience of assessing noise levels or of other types of input data. Data from different transport administrations had different formats. Incomplete databases, including traffic intensities (since completed). Inconsistent data, and incorrect formats for maps.	There were no significant changes for railways and roads. New noise maps were only developed for Brussels Airport.
Flanders	Data differences between site designation deadline (2005) and reference year SNMs (2006) A lack of clarity in definitions (Article 3 of the END), especially agglomeration	Differences in data between site designation deadline (31th December 2008) and SNMs reference year (2011). The most recently available data was used for the SNMs of major roads (reference year 2011). The delineation of the agglomeration of Antwerp (as defined for the implementation of Directive 2002/49) changed for R2. In R1 SNMs, the district 'Berendrecht-Zandvliet-Lillo' of the city of Antwerp weren't included in the delineation of the agglomeration. During the public consultation for the first NAP, several commentators asked that 'Berendrecht-Zandvliet-Lillo' be included in the SNMs and the NAP. For this reason, the delineation of the agglomeration of Antwerp was extended for R2. The delineations of agglomerations are based on administrative units (municipalities).
Wallonia	A lack of clarity in definitions (Article 3), especially of "agglomeration" led to many discussions and subsequent delays.	No new issues were raised

3.4 Noise limits and targets

3.4.1 Scope

3.4.2 Brussels

Noise limit values applied in the Brussels Region are shown in the table below.

Table 15 Noise limit value – Brussels region – Belgium

Noise source	L_{night}	L_{day}	$L_{evening}$	Comments
Road traffic	60	65		Limit values defined in LAeq (8h) which correspond to intervention levels, i.e. noise levels from which the acoustic situation of residents is seen as intolerable and requires public authorities' intervention. Not legally-binding
Rail traffic	60; 65; 68	65; 70; 73		LAeq,T (22-7h) and (7-22h): specific measures at façades. Defined by the environmental convention signed between the Brussels Region and the SNCB (Belgian National Railway Society). For each period, 3 levels of intervention are defined
Aircraft around airports	55 (Zone 2) 50 (Zone 1) 45 (Zone 0)	65(Zone 2) 60 (Zone 1) 55 (Zone 0)		LAeq,T (23-7h) and (7-23h): specific to environmental noise, generated by planes. Limit values set by order of 27 May 1999 of the Government of the Brussels. Three zones are defined in the region. Enforcement and mitigation measures are described in order of 25 March 1999 regarding search, recognition and suppression of infringements in environmental matters. SEL is also used to characterise flights
Industrial activity sites	33-54	42-60	36-60	LAeq,T (22-7h), (7-19h) and (19-22h) take into account total level of noise, level of environmental noise and value of possible tonal emergence. Limit values defined by Order of 2 July 1998 regarding the fight against noise and vibrations generated by installations. Enforcement and mitigation measures are described in order of 25 March 1999 regarding search, recognition and suppression of infringements in environmental matters

3.4.3 Flanders

Legal noise limit values for road and rail traffic noise have not yet been set in the Flanders Region, although environmental impact assessment (EIA) procedures take non-binding guide values into account. Limit values for establishments considered to be a nuisance are set out in Flemish regulations: VLAREM II appendix 4.5.4 Guide values for the specific noise in the open air of establishments classified as nuisance-producing and appendix 4.5.6. Guide values for fluctuating, incidental, impulsive and intermittent noise in the open air caused by establishments classified as nuisance-producing.

The environmental conditions for classified establishments can be consulted at: https://navigator.emis.vito.be/mijn-navigator?woId=9484

3.4.4 Wallonia

The Walloon Region has no overview of noise limit values available in tabular form, except for industrial sites (see below).

Table 16 General noise limit values for classified installations (dB) – Wallonia

Zones in which noise emission limit values apply		Day 7-19hr	Transition 6-7hr/19-22hr	Night 22-6hr
I	All zones within 500m of an extraction zone, centre of industrial or economic activity, or at least 200m from a zone of mixed economic activities, within which the installation is situated	55	50	45
II	Rural zones, excepting Zone I	50	45	40
III	Agricultural, forested, green and natural zones, except Zone I	50	45	40
IV	Recreation zones, public services and community facilities	55	50	45

The Walloon Region adopted limit values for road and rail noise inside agglomerations above which action plans must be prepared, on 17 December 2015.

Noise source	L_{day}	L_{night}
Road traffic	70	60
Rail traffic	70	60

3.4.5 Purpose

The enforcement of noise limit values varies by region.

Table 17 Noise limit values enforcement – Belgium

Region	Description
Brussels	1999 Order on plane noise - airlines can be held responsible for exceedance of noise limit values (determined through monitoring sites) and be fined accordingly 1998 Order on neighbourhood noise - relies on complaints from neighbours - the inspectorate in charge of noise limit enforcement given a mediation power – revised and updated in 2002 1998 Order on IPPC noise - if installation exceeds noise limits, inspectorate must require works to be done on the site to reduce noise – revised and updated in 2002 Railways - BGE agreement with SNCB (Belgian National Railway) to conduct noise studies and establish noise abatement measures on new infrastructures. The same approach applied to STIB (Brussels Public Transport Society) for future public transport infrastructure. The purpose is to make noise an environmental issue that is systematically taken into account by transport administrations
Flanders	Legal noise limit values for road and rail traffic noise have not yet been determined Limit values for establishments considered to be a nuisance are set out in environmental licenses
Wallonia	No information is available on the method for establishing limit values for agglomeration, road, railways and aircraft noise

3.4.6 Non-binding target values

The Flemish Environment, Nature and Energy Department has completed a study to edit the NAPs for the major roads and railways in R2. Noise priority areas were identified on the basis of a threshold value by using the SNMs.

3.4.7 Comparison of limits and targets with WHO guidance

The WHO's health-based assessments were used in Brussels and Flanders regions.

Table 18 Noise limit values and the WHO – Belgium

Region	Description
Brussels	WHO health-based assessments were used, but were refined on the basis of actual experience. Limit values had to be tailored to Brussels' unique urban-only nature. Otherwise the whole region would have been a red zone, and it would have been more difficult to set priorities.
Flanders	WHO health-based assessment and studies provided by the WGHSEA (Working Group Health and Socio-Economic Aspects) were used in preparatory studies for the NAPs of R1 and R2 to determine threshold values to detect noise priority spots.
Wallonia	No information available

3.4.8 Implementation issues

No issues were raised in relation to noise limit values in either Round.

3.5 Quiet areas

3.5.1 Overview

No methodology was established at national or regional level for delimiting quiet areas.

Table 19 Criteria used for the delimitation of quiet areas – Belgium

Region	Description
Brussels	IBGE launched a study in June 2009 to obtain an acoustic and sociological picture of the possibilities for "quiet area" delimitation within the agglomeration and to support the revision of NAPs to include quiet areas defined on criteria other than purely acoustic ones. The study is available at: http://document.environnement.brussels/opac_css/doc_num.php?explnum_id=4752 http://www.environnement.brussels/etat-de-lenvironnement/rapport-2007-2010/bruit/focus-zones-de-confort-acoustique
Flanders	No quiet areas were designated on the basis of the END. The Flemish government has a "silence area" policy in open country, independent of END. The "silence areas" are determined on the basis of acoustic and non-acoustic criteria, based on a regional methodology.
Wallonia	No quiet areas have been designated on the basis of the END

The table below summarises the number and size of quiet areas established during R1 and R2.

Table 20 Quiet areas – Belgium

	R1		R2	
	All regions	Brussels	Flanders	Wallonia
Number	0	1 (Forêt de Soignes)	0 (designated on the basis of the END)	0
Size (km^2)	0	~16km² (10% of Brussels Region)	0 (designated on the basis of the END)	0

3.5.2 Delimitation

Flanders

No change.

Brussels Region

- $L_{den} \leq 55$ dB (A)
- Legally accessible to all at no charge with no physical barrier (to entry)
- A ground vegetation rate greater than 50%
- A clear daily use/role, evidenced by the presence of street furniture
- Clear paths within an area of at least 100 metres or 1 hectare)
- Little noise from terrestrial transport modes, with L_{den} at least 50% of 55 dB (A)

3.5.3 Agglomerations

In the Flanders NAPs for agglomerations (Antwerp, Ghent and Bruges) - R2, which is under preparation - actions regarding quiet areas are included. There are no regional criteria for quiet areas. Rather, each agglomeration will instead develop its own method for the delimitation and preservation of quiet areas.

3.5.4 Open country

Flanders still uses its own classification system to determine rural quiet areas based upon acoustic (L_{A50}) and non-acoustic criteria.

3.5.5 Implementation issues

A number of issues were raised as a result of R1 implementation, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 21 Quiet area issues - Belgium

R1	R2
Brussels	
As the Bruxelles-Capitale Region is entirely urban, END definitions and guidelines were not precise enough on quiet areas within agglomerations	No change
Flanders	
Linking Flanders-based rural silent areas with END requirements	Each agglomeration will develop its own method for the delimitation and preservation of quiet areas during R2.
Since noise mapping only covers the most significant transport infrastructure (such as major roads and railways or airports), there is a lack of mapping in rural areas to help identify quiet areas.	Same as previous. A lack of mapping to help identify quiet areas in rural areas. No new issues.
SNMs of agglomerations, containing quiet areas, were still being worked on in 2010.	SNMs of agglomerations have been finished and reported. R2 NAPs are still in the process of being prepared. These are expected to include quiet areas.

3.6 Strategic noise mapping

3.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 22 SNMs - Belgium

	R1			R2		
	Brussels ***	Flanders	Wallonia	Brussels ***	Flanders	Wallonia
Agglomerations	8	14	n/a	4	20	12*
Major airports	n/a	2	n/a	n/a	2	n/a
Major railways	n/a	2	2	n/a	2	2**
Major roads	n/a	2	2	n/a	2	2**

** The maps for the 2 major agglomerations > 100 000 inhabitants (Liège and Charleroi) were adopted by the Walloon Government on 17 December 2015, but they have not yet been reported to the Commission. The number amounts to 12 because separate maps were produced for the values L_{den}, L_{night}, for industry, railways and roads.*

*Only END-required maps have been reported, but far more were developed in R1 – A large number of maps for 2006 were created, covering: Periods : days of week, days of week-end and all the week; Noise indicators : L_d, L_e, L_n, L_{den} + exceeding of limit values; per transport mode (roads, railways, aircrafts and tramways & underground) and all transports (multi-exposure, only L_{den} and L_n for days of all the week, thus 2 maps + 2 conflict maps according to the attribution of ground); 2015 different RER scenarii, same noise indicators and periods + differential maps 2006-2015; **Liege and Charleroi, each with road L_{den}; road L_{night}; railway L_{den} railway L_{night}; industry L_{den}; industry L_{night}*

*** the preparation of SNMs for the major railways and major roads is currently being finalised, they are not yet approved by the Walloon Government and not yet reported to the Commission.*

****Only END-required maps have been reported, but far more were developed in R1 – A large number of maps for 2006 were created, covering: Periods : days of week, days of week-end and all the week; Noise indicators : L_d, L_e, L_n, L_{den} + exceeding of limit values; per transport mode (roads, railways, aircrafts and tramways & underground) and all transports (multi-exposure, only L_{den} and L_n for days of all the week, thus 2 maps + 2 conflict maps according to the attribution of ground); 2015 different RER scenarios, same noise indicators and periods + differential maps 2006-2015. Major airports, railways and roads are included in the SNMs for the agglomeration of Brussels, hence no separate maps had to be produced.*

3.6.2 Flanders

For major roads and railways, a clear comparison of noise exposure between Rounds is not feasible as R2 took into account considerably more roads and railways than in R1. For other sources, changes in noise contours and exposure data are largely due to differences in input data used in the noise models. For example, in R2:

- For major roads and railways, input data (the format of census data, GIS layer of houses) used to calculate noise exposure were different (see below)
- For the major agglomerations of Antwerp and Ghent, the source of the traffic model of the major roads was different, and a more detailed layer for the soil absorption effect was used.
- The delineation of the agglomeration of Antwerp (as defined for the implementation of Directive 2002/49) was changed.

3.6.3 Data collection

The methods used in each region are outlined in the table below.

Table 23 Data collection by region – Belgium

Region	Round	Description
Brussels	1	• Time required to collect data for strategic noise mapping was underestimated as competences were split between different administrations • The collection of one year's noise data on railways, roads and agglomeration between the beginning of 2007 and processing it before the end of June was impossible • SNMs were delayed compared with the timetable in the Directive. These were not ready until Spring 2009 • Data on noise barriers proved very hard to obtain and required aerial photographs and modelling of average heights
	2	There were still issues with regard to carrying out noise mapping between different administrations.
Flanders	1	• Data on general (non-acoustic) information, such as geographic information or information about housing located in proximity to major transport infrastructure, was problematic. • Calculation of exposure data requires information about the number and the exact location of the neighbouring inhabitants of a specific infrastructure. In absence of such information, a worst-case approach was taken – leading to potentially considerable over-estimations
	2	• Data were available from different administrations, and no specific problems were reported. • For the calculation of noise exposure data of major roads and major railways, more detailed (non) acoustic information was available in R2. • For R1, the number of residents and the number of dwellings per statistical segment was assigned to residential buildings in proportion to their volume. And there was no GIS layer available for single houses, a layer that consists of large building blocks was used. For R2, a GIS layer where all houses are indicated separately and the number of inhabitants per address was used to calculate the noise exposure data.
Wallonia	1	• Data were available from different administrations, and no specific problems were reported
	2	• Data were obtained from different administrations or surveys, and the national railway company for rail traffic

Responsibilities within each region are outlined in the table below.

Table 24 Data collection responsibilities

Region	Agglomerations	Major airports	Major railways	Major roads
Brussels	IBGE collects all data from CAs - SNCB and Infrabel (rail), Brussels Mobility (roads), Belgocontrol and Brussels Airport (airports), CIRB (buildings), INS (population…)			
Flanders	City authorities		Non-acoustic data (geographic information, housing, building height, topography) - The Environment Nature and Energy Department – Air, Nuisances, Risk management, Environment and Health Division with data mainly provided by the Agency of Geographical Information in Flanders (AGIV)	
			Velocity data, annual traffic intensity data, railway network, location of noise walls,) - national railway company (NMBS and Infrabel).	Velocity data, annual traffic intensity data, road network, location of noise walls, - Road and Traffic Agency
Wallonia	Consultancies are responsible for the data collection			

Although data were delivered by several administrations in Flanders, no specific availability problems have been experienced. In Wallonia, all necessary topographical and traffic input data were available.

3.6.4 Strategic noise mapping methods

Overview

Belgium's location necessitated co-operation with neighbouring regions, with intra-regional alignment required to ensure that cross-border regions were covered in noise mapping.

Brussels

Table 25 Strategic noise mapping method - Brussels

Round	Method
1	Data obtained by cross-referencing different information types (buildings, uses, census of population by statistical sectors, etc.) and formats (Excel, ArcView, Access) Resultant variability was problematic IBGE had to advise public and professional users that map results were global and not realistic pictures of local noise levels L_{den} and L_{night} indicators were used as well as L_{day} and $L_{evening}$ to have a complete view of the day It has been reported that the use of L_{day} and $L_{evening}$ allows a more realistic approach than L_{den}. The weighted average used for L_{den} for the evening or the night indicates that it is much more an annoyance indicator than an indicator of the real level of noise. National Public Transport noise indicators, LA_{eq} 8h Day et L_{Aeq} 8h Night were also used as special indicators (before harmonization in L_{den} and L_{night}). The 2007 GPG was used, as well as the guidelines of the CERTU (French Centre of Studies for Networks, Transport, Town-planning and Construction) « Strategic noise mapping in urban areas». For Strategic noise mapping, IBGE subcontracted to a French research department, which used the CERTU's study.
2	IBGE has made the transition to using END recommended interim methods.

Flanders

Table 26 Strategic noise mapping - Flanders

Round	Method
1	No guidelines were given to agglomerations that had to draw up SNMs, but the authorities organised a preparatory study in which a sound model was specifically developed for the data available in agglomerations L_{den} and L_{night} indicators and other supplementary indicators were used. (Airports referred to the frequency of exceeding values using LA_{max} indicators, and not just L_{den} and L_{night}) There was a discrepancy between the required scale-size for site designation (road network: 1.900km, railway network: 300km) and the required precision of the maps to evaluate how many people were exposed For roads and railways, the authorities followed the GPG and the GIS (Geographic Information System) as much as possible Protocols indicating equivalences between calculation methods were only made available by the Commission late in the process

Round	Method
2	Road traffic noise was computed by the Dutch national computation method published in: "Reken- en Meetvoorschrift Wegverkeerslawaai 2006" (RMV/ SRM II) including all revisions up to the 2009 version. The software used for the computation is IMMI. Rail traffic noise was computed by the Dutch national computation method: 'Reken- en Meetvoorschrift Railverkeerslawaai 2006' RMW/ SRM II including all revisions up to version 2009. The software used for the computation is IMMI. Industrial noise was computed by the ISO 9613-2 – Acoustics: Attenuation of sound propagation outdoors, Part 2; General method of calculation. The software used for the computation is IMMI Air traffic noise was computed by the Integrated Noise Model (INM) version7.0b, published by FAA (U.S. Federal Aviation Administration), taking into account recommendation 2003/613/EC of the Commission. L_{den} and L_{night} indicators only were used for strategic noise mapping. When no data were available, the assumptions from the EC's Good Practice Guide for Strategic noise mapping and the Production of Associated Data on Noise Exposure of the was used. The "precautionary principle" was followed to determine the number of people and number of dwellings exposed. The highest noise level on the most exposed façade of the building was attributed to all persons in the building as their "most exposed facade" levels. All reported numbers are calculated using this "precautionary principle" approach. This indicates that the numbers reported are possible overestimated in case of apartment buildings. The noise models of the agglomerations of Antwerp and Ghent were only partially updated in R2. In the noise model of Ghent, only the traffic intensities of the major roads and railways were updated. In the noise model of Antwerp, the traffic intensities of the major roads and railways were updated, and also the census data per address, the noise emission of industry in the port of Antwerp and the noise emission of the regional airport of Deurne were updated.

Wallonia

Table 27 Strategic noise mapping - Wallonia

Round	Method
1 + 2	L_{den} and L_{night} indicators only were used GPG and "Presenting Strategic noise mapping to the Public" guides were both used All Strategic noise mapping was made in line with END-recommended methods: industrial noise: ISO 9613-2; road noise: NMPB 2008; rail noise: SRM II

3.6.5 Public accessibility

Table 28 Public accessibility of SNMs and presentation by region – Belgium

Region	Round	Source
Brussels	1	SNMs available at: http://www.ibgebim.be/Templates/etat/informer.aspx?id=3082&langtype=2060&detail=tab3
	2	Entry to portal - http://www.environnement.brussels/thematiques/bruit-0 SNMs available at: http://www.environnement.brussels/thematiques/bruit/la-situation-bruxelles/cartographie-et-exposition-de-la-population?view_pro=1&view_school=1 and for Brussels Airport (2011): http://document.environnement.brussels/opac_css/doc_num.php?explnum_id=4915
Flanders	1	SNMs were available on website
	2	Available at: http://www.lne.be/themas/hinder-en-risicos/geluidshinder/beleid/eu-richtlijn/goedgekeurde-geluidskaarten/goedgekeurde-geluidskaarten-ontwerp SNMs for the major roads, railway lines and airports are also available at: www.geopunt.be
Wallonia	1	SNMs available at: http://carto1.wallonie.be/CIGALE/viewer.htm?APPNAME=BRUIT.
	2	As of April 2016: For the Walloon Region the preparation of the maps for the R2 SNMs for major railways and major roads is currently being finalised. They have not yet been approved by the Walloon Government and have not yet been reported to the Commission. The SNMs for the major agglomerations were adopted by the Walloon Government on 17 December 2015, but they have not yet been reported to the Commission.

3.6.6 Implementation issues

A number of issues were raised in R2, a summary of which is shown below.

Table 29 Strategic noise mapping issues - Belgium

Flanders	Wallonia
The collection of data on railways and roads for the reference year 2011 at the beginning of 2012 and processing it before the end of June was not possible. A whole year was needed to prepare SNMs of major roads and railways. Not all data for the preparation of SNMs was available with the desired accuracy and level of detail. It was sometimes necessary to make assumptions. The Good Practice Guide was used as much as possible.	Rules and constraints on public expenses result in a significant administrative burden The first contract awarded to a consultancy for R2 road Strategic noise mapping was contested and cancelled. The procedure had to be started all over again. This partly explains the delay for Strategic noise mapping (R2) in Wallonia.

3.7 Noise action planning

3.7.1 Overview

An overview of NAPs is shown in the following Table. In 2010, NAPs had yet to be drawn up for the Walloon Region.

Table 30 NAPs – Belgium

	R1			R2		
	Brussels	Flanders	Wallonia	Brussels	Flanders*	Wallonia**
Agglomerations	1 for all sources	2	n/a	1 for all sources	3*	2
Major airports		1	n/a		1*	n/a
Major railways		1	n/a		1*	1~~?~~
Major roads		1	n/a		1*	1~~?~~

** The NAPs in Flanders for Round 2 are currently in preparation, they have not yet been reported to the EC*

*** The NAPs for the major agglomerations with more than 100,000 inhabitants (Liège and Charleroi), major railways and major roads are currently in preparation.*

3.7.2 Methodologies for noise action planning

Table 31 Noise action planning methodology by region – Belgium

Region	Round	Methodology
Brussels	1	Consultations of administrations (transport, public authorities, etc.) were conducted before the public consultation begun No regional methodology was established because a previous plan had already been drawn in 2000. Experience and results of this first plan (and not 2006 maps as they were not finished by that time) used to draw up the new one. Areas of exceedance and health-based assessment used to set NAP priorities Other criteria for setting priorities included complaints, public inquiry, polls, land settlement The Brussels urban land settlement is based on the PRAS (Plan Régional d'Affectation du Sol), which is a regulatory document. Noise action planning requires relying on this plan to set priorities. Indeed, noise-protected areas are going to be mainly residential areas (although green open spaces will be protected too) and IBGE uses the PRAS to determine which zones are residential ones, which are constructible, etc.
	2	No change
Flanders	1	The provisional NAP drawn up was revised in 2010 on the basis of a further analysis of noise mapping data. The authorities set up a provisional plan, to be refined later, to prioritise noise in making current policy and budgetary choices.
	2	All NAPs are now complete and are at various stages of approval.
Wallonia	1	After R1 strategic noise mapping, the DG responsible for roads (DGO1) developed a method to prioritize noisy sites along major roads. This method is for now waiting for approval from the Walloon government. The NAP will be based on this method and the hierarchical list established according to the method constitutes a guide to determine the annual budget allocation.
	2	R2 NAPs are to be prepared when corresponding SNMs have been approved, and will adopt the same method developed for R1 mapping.

3.7.3 Measures

Table 32 NAP measures by region – Belgium

Region	Round	Measures
Brussels	1	Traffic planning, land-use planning, technical measures at noise source, insulation, selection of quieter sources, reduction of sound transmission, regulation and incentives Collaboration enquiries, conventions, studies and awareness raising also used The measures were selected on (1) compatibility with existing legislation (as they are already several pieces of legislation on noise), then (2) flexibility, as the diversity of administrations (whether at local or ministerial level) necessitated a flexible approach based on compromises and dialogue Estimated NAP implementation costs for the administration: € 5.5 million over five years. Same amount expected for future Rounds of END implementation. Costs of stakeholders not estimated
	2	The interim version of the 2008-2013 plan is available at: http://document.environnement.brussels/opac_css/elecfile/RAP%20201207%20PlanBruitBilanCE%20FR Actions are set out in tables on pages 13 to 15. A new version will be prepared before moving to a new plan (probably in 2017).
Flanders	1	Exceedance limit values were taken into consideration to set up measures to reduce noise, but the specific manner as to how to do this still needed to be specified. Several possible measures were developed and simulated on noise models to assess their effects for Flanders. On the basis of that simulation, as well as through a cost-benefit analysis to compare population exposure and recommendations of the WGHSEA from health-based assessment with economic desirability, noise abatement measures were identified.
	2	For the major airport and agglomerations draft action plans are publicly available from http://www.lne.be/themas/hinder-en-risicos/geluidshinder/beleid/eu-richtlijn/actieplannen The plans contain a number of proposed actions, and have already been subject to a public consultation, but none has yet been approved by the Flanders government. The draft action plans for major roads and railways are not yet publicly available.
Wallonia	1	As a result of R1 noise mapping, an estimated 188 km of major roads are to be treated with noise barriers, with a total estimated budget of € R250 million. Concrete measures will be implemented as budgets become available.
	2	Continued implementation of the R1 NAP

3.7.4 Public consultations

Table 33 NAP public consultation by region – Belgium

Region	Round	Description
Brussels	1	The public consultation took place between 15 October - 15 December 2008
	2	As the 2008-2013 plan is still being implemented and there has been a delay in the R2 NAP being adopted, there has as yet not been a further public consultation.
Flanders	1	The provisional NAPs have been presented to the public before being approved by the government. They should be approved in July but the change of regional government could have compromised that.
	2	Public consultations on the draft NAPs for major agglomerations (Antwerp, Ghent and Bruges) ran from 8 June to 31 July 2015. The results have already been integrated into the NAPs, and the latter's submission to the Government of Flanders for final approval is expected soon. The public consultation on the Brussels Airport draft NAP ran from 16 November 2015 to 15 January 2016. The results of the public consultation are currently being processed. Submission to the Government of Flanders for notification of the draft action plans for the major railways and major roads has taken place on 25 March 2016. The public consultation for the draft action plans of major roads and railways will be organised from 15 April 2016 to 15 May 2016.
Wallonia	1	None have yet been undertaken
	2	None have yet been undertaken

3.7.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 34 Noise action planning issues – Belgium

R1	R2
Brussels	
There is a need for consensus between the different authorities responsible for drawing up NAPs as to action planning priorities	Action planning has been delayed in R2. No detailed information available.
Flanders and Wallonia	
The short time-span between SNM NAPs completion deadlines, with input from the former required for the latter	More time to develop NAPs would be desirable. The period of one year between finalising SNMs and developing NAPs is too short Preparing and conducting NAPs every 5 years is very time consuming, and has also financial implications. A longer time-span between the consecutive rounds of Noise action planning is desirable.

4. BULGARIA

4.1 National implementing legislation for END

4.1.1 Legal implementation

The END was transposed by means of the Law on Protection from Environmental Noise[14] published in State Gazette no. 74/13.09.2005[15]. The Law on Protection from Environmental Noise covers all the requirements for preparation and contents of SNMs and NAPs.

Some Orders of the Ministry (OM) provide clarification on the technical details related to noise indicators, strategic noise mapping, noise action planning, and the evaluation of SNMs and NAPs. The different applicable national regulations that transpose the END are as follows[16]:

- Ordinance № 54 of 13.12.2010 on the activities of the national system for the monitoring of environmental noise and the requirements for internal monitoring and information from industrial sources of environmental noise.[17]
- Ordinance № 6 of 26.06.2006 for environmental noise indicators, taking into account the degree of discomfort at different parts of the day, setting limit values in respect of noise indicators, methods for assessing the performance levels of noise and the harmful effects of noise on human health[18].
- Ordinance on the essential requirements and conformity assessment of machinery and equipment for use outdoors, in terms of noise emissions in the air[19].
- Ordinance № 3 of 25.04.2006 on the requirements for the creation, maintenance and content of the registers of agglomerations, major roads, railways and airports in the country[20].

[14] available in English, old version last modified in 2012 http://www.moew.government.bg/?show=top&cid=309&lang=en

[15] effective from 1.01.2006 and amended by the law published in State Gazette no. 30/11.04.2006, effective from 12.07.2006, amended and supplemented by the law published in State Gazette no. 41/2.06.2009, effective from 2.06.2009, amended by the law published in State Gazette no. 98/14.12.2010, effective from 1.01.2011, supplemented by the law published in State Gazette no. 32/24.04.2012, effective from 24.04.2012, amended by the law published in State Gazette no. 66/26.07.2013, effective from 26.07.2013 amended by the law published in State Gazette no. 98/11.28.2014, effective from 28.11.2014; available in Bulgarian new version last modified in 2014 http://www.moew.government.bg/files/file/Noise/Legislation/Zakoni/ZAKON_za_zashtita_ot_shuma_v_okolnata_sreda.pdf

[16] in Bulgarian on http://www.moew.government.bg/?show=top&cid=310&lang=bg

[17] issued by the Minister of Health and Minister of Environment and Water, published in SG no. 3/ 11. 01. 2011 with effect from 12.02.2011 in Bulgarian on http://www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_54_monitoring_shum.pdf

[18] issued by the Minister of Health and Minister of Environment and Water, published in SG no. 58/18.07.2006 in Bulgarian - www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_6_pokazateli_sum.pdf

[19] adopted by Decree No 22/29.01.2004, published in SG no. 11/10.02.2004, with effect from 11.02.2005, with all amendments and supplements in Bulgarian on http://www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_sashtestveni_iziskvaniya_shum.pdf

[20] issued by the Minister of Health, Minister of Regional Development and Public Works and the Minister of Transport, published in SG no 38/9.05.2006 in Bulgarian on

- The Ordinance on the development and content of SNMs and NAPs adopted by Decree no. 217/18.08.2006, published in SG 70/29.08.2006[21]
- Ordinance № 16 of 01.14.1999 on aircraft noise and emissions from aircraft engines[22]

4.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Bulgaria included 3 agglomerations and approximately 89 km of major roads. The introduction of definitive thresholds in R2 led to 6 *additional* agglomerations being covered, and the length of major road covered increased to 1,044 km. No airport or railways met the R1 or R2 size designation criteria.

Table 35 E ND coverage – Bulgaria

Round	Agglomerations	Major airports	Major rail	Major roads
1	3[23]	n/a	n/a	89 km
2	7[24]*	n/a	n/a	1,044 km

** According to the 2011 population census the towns of Sliven and Dobrich have below 100,000 people[25]*

4.2 Competent Authorities and designated administrative bodies

Environmental Noise responsibilities for strategic noise mapping and noise action planning as specified by the Law on Protection are presented in the table below.

Table 36 Responsibility for the END – Bulgaria

Role	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities	Ministry of Regional Development and Public Works	Minister of Transport	Minister of Transport

http://www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_3_ot_25_04_2006.pdf

[21] adopted by Decree No 217/18.08.2006, published in SG 70/29.08.2006 with effect from 11.02.2005 in Bulgarian on http://www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_sashtestveni_iziskvaniya_shum.pdf

[22] issued by the Minister of Transport, published in SG 8/29.01.1999, effective form 1.03.1999, with all amendments and supplements in Bulgarian on http://www3.moew.government.bg/files/file/Noise/Legislation/Naredbi/Noise/NAREDBA_16_aviacionen_sum.pdf

[23] Plovdiv, Sofia, Varna

[24] Pleven, Ruse, Stara Zagora, Burgas, Varna, Plovdiv, Sofia

[25] available in English at National Statistical Institute at http://www.nsi.bg/census2011/pageen2.php?p2=179&sp2=209

Role	Agglomerations	Roads	Railways	Airports
Approving SNMs	Minister of Health and Minister of Environment and Water give an opinion regarding the SNMs Municipal councils approve noise maps	Ministry of Health*		
Collecting SNMs	Ministry of Health and the Ministry Environment and Water			
Preparing NAPs	Municipalities	Ministry of Regional Development and Public Works		
Approving NAPs	Municipal councils approve noise maps	Ministry of Health*		
Collecting NAPs	Ministry of Health and the Ministry Environment and Water			
EC/EEA reporting	Executive Environmental Agency [26]			
Environmental monitoring	Executive Environmental Agency [27]			

** Minister of Health and the Minister of Environment and Waters determined by equal number of members of the expert council for approving the SNMs.*

4.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

4.3.1 Data collection

Bulgaria reported on major roads, railways, airports and agglomerations for the whole of 2008 to the EIONET Central Data Repository for the EC in both R1 and R2[28]. The maps and the NAPs are available on the website of the Ministry of Environment and Water of Bulgaria[29].

The number of inhabitants for each city is available on the website of the National Institute for Statistics and the data to delimit major roads is available from the Central Institute of Road Technologies, National and European Norms and Standards. At the beginning of each year, the Ministry of Regional Development and Public Works defines them while updating the "**Agglomerations** register according to the Law of Protection from Noise in the Environment" (http://www.regag.eu/?l=2).

The information about the **major roads** in Bulgaria with more than 3,000,000 vehicle passages a year is collected after the Total profile traffic counting on the national road network, carried out by the Institute for roads and bridges - a specialized unit within the Road Infrastructure Agency. This happens every five years. The data will next be processed in 2016.

[26] http://epanet.pbe.eea.europa.eu/european_epas/countries/bg

[27] http://eea.government.bg/en/about/directorates.html

[28] http://cdr.eionet.europa.eu/bg/eu/noise/

[29] http://eea.government.bg/bg/dokladi/noise

In Bulgaria there are no **major railways**. According to data collected annually by the National Railway Infrastructure Company, the number of train passages per year train is less than the END threshold of 30,000 train passages annually.

With regard to **major airports**, the Directorate General "Civil Aviation Administration" of the Ministry of Transport, Information Technology and Communication, stated that there are no airports in Bulgaria that fall within the END (i.e. none have more than 50,000 movements annually).

4.3.2 Implementation issues

A number of issues were raised as a result of experiences gained over both Rounds of END implementation.

Table 37 Designation issues - Bulgaria

R1	R2
Lack of required input data	Lack of required input data. Data collection and ensuring data consistency were the main challenges.
Cost of SNM development	Cost of SNM development
Duration of necessary legal procedures	Duration of necessary legal procedures and duration of tendering.

4.4 Noise limits and targets

4.4.1 Objectives and Scope

The environmental noise indicators for Bulgaria are set out in Ordinance № 6 of 26.06.2006, which takes into account the relative degree of annoyance due to environmental noise exposure at different times during the day, the limit values for environmental noise indicators and the methods for assessing environmental noise values and the harmful effects of noise on human health.

According to the Law on Protection from Environmental Noise, "Limit" is the value of the indicator for noise beyond which CAs have to consider and implement measures to reduce noise.

The noise indicators defined in Ordinance № 6 of 26.06.2006 are for day L_{den}, for evening $L_{evening}$, and for night L_{night} and for 24 hours L_{24hr}.

Noise limit values are set for:

- The day (07.00-19.00), evening (19.00-23.00) and night (23.00-07.00)
- L_{night} and L_{24hr} are used for the evaluation of strategic noise mapping results.

Table 38 Noise limit values - territories and development zones in urban areas and outside used in strategic noise mapping – Bulgaria

Territories and development zones in urban areas and outside		Equivalent Level of Noise dB (A)		
		day	evening	night
1	Residential areas and territories	55	50	45
2	Central areas	60	55	50
3	Areas exposed to heavy traffic	60	55	50

Territories and development zones in urban areas and outside		Equivalent Level of Noise dB (A)		
4	Areas exposed to track railway and tram	65	60	55
5	Areas exposed to aircraft noise*	65	65	55
6	Production and storage areas and zones	70	70	70
7	Areas for public and individual recreation	45	40	35
8	Areas for hospitals and sanatoriums	45	35	35
9	Areas for research and training activities	45	40	35
10	Quiet areas outside agglomerations	40	35	35

**Limit for the maximum noise level flyover of aircraft over a certain territory is 85 dB (A).*

4.4.2 Non-binding target values

In Ordinance № 6 of 26.06.2006 (also referred to earlier), other noise limits used for measurement or noise assessment purposes but not used for strategic noise mapping and noise action planning are provided.

Table 39 Noise limit levels - residential premises and public buildings – Bulgaria

Purpose premises		An equivalent level noise, dB (A)		
		day	evening	night
1	Rooms in hospitals and sanatoria, operating rooms.	30	30	30
2	Living rooms, bedrooms in childcare and dormitories, recreation stations, hotel rooms	35	35	30
3	Consulting rooms in hospitals and sanatoriums, conference rooms, visual halls of theatres and cinemas.	40	40	35
4	Classrooms and auditoriums in educational establishments; Bars, restaurants for research activity, reading	40	40	40
5	Workplaces in the administrative buildings.	50	50	50
6	Cafeterias, canteens, lobbies theatres and cinema, clubs; hairdressing and beauty salons, restaurants.	55	55	*55*
7	Commercial halls of shops, halls passengers in stations.	60	60	60

4.4.3 Implementation issues

WHO guidance has not been taken into account.

Issues raised in R1 and R2, together with actions taken to address them are shown in the table below.

Table 40 Noise limits and targets issues: R2 - Bulgaria

Issue	Action
A limit for quiet areas in agglomerations does not exist. It is not clear by how much a noise value should be decreased.	Legislative modifications are being made to address this problem.

4.5 Quiet areas

4.5.1 Overview

No quiet areas have been designated to date. Within agglomerations, quiet areas have been proposed by consultants, but the responsible competent authorities have not as yet designated any quiet areas.

Definition

The Law on Protection from Environmental Noise provides the following definitions:

- "Quiet areas in urban areas" is part of the territory where values of noise performance are higher than the corresponding limit values.
- "Quiet areas outside urban areas" are defined as a territory where noise levels may not exceed certain limits due to transport, industry or from places of entertainment.

Delimitation

The law requires a list to be prepared of zones which be designated as quiet areas. This includes parks and gardens, areas around schools, hospitals etc. It is apparent that the examples are not delimited based on acoustic criteria.

Agglomerations

The Ordinance on the development and content of SNMs and NAPs adopted by Decree no. 217/18.08.2006 specifies that every NAP must include measures to preserve quiet areas.

Open country

Ordinance № 6 of 26.06.2006 only contains limit values for quiet areas in open country.

4.5.2 Implementation issues

A number of issues were raised as a result of experiences over both Rounds.

Table 41 Quiet area issues – Bulgaria (R1 and R2)

Issue	Action
Within agglomerations, quiet areas were proposed by consultants. However, in the relevant legislation, no clear method is provided which requires the competent authority to actually establish quiet areas. Competent authorities can also declare that the agglomeration does not have any quiet areas.	Legislative modifications are foreseen in future.
A limit value to determine quiet areas in agglomerations does not yet exist. It is also not clear in the case of exceedance by how much a noise value should be decreased.	Legislative modifications are foreseen in future.

4.6 Strategic noise mapping

4.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown in the table below.

Table 42 SNMs - Bulgaria

	R1	R2
Agglomerations	3	7 (7[30])
Major airports	-	n/a
Major railways	-	n/a
Major roads	1	1 (1)

**1 SNM for all major roads (89km)*

***1 SNM for all major roads (1044km)*

4.6.2 Data collection

Decree № 217 from 18.08.2006 stipulates that the input and output data of the SNMs in digital and graphic form in accordance with the Bulgarian Geodetic System 2000 SNMs shall be developed in compliance with the Law on Cadastre and the Property Register.

Obtaining data for strategic noise mapping is the responsibility of the consultant from the institutions and local authorities (i.e. city halls).

4.6.3 Strategic noise mapping methods

According to the Ordinance № 54 of 13.12.2010 of the national monitoring system of environmental noise and requirements for internal monitoring and providing information from industrial sources of environmental noise; the Regional Inspectorates for Protection and Control of Public Health create a database in which data collected from all measurements and / or calculations carried out at noise monitoring stations in their territory must prepare a consolidated annual report on the level of noise pollution in urban areas as part of the development of an annual report on the state of health. The number, location and distribution of noise monitoring stations and the frequency of measurements and / or calculations shall be determined by a method approved by the Minister of Health.

Only L_{24hr} and L_{night} are used for strategic noise mapping. The table below identifies the strategic noise mapping methodologies used in Rounds 1 and 2.

[30] First, 9 were reported 9 but 2 of the agglomerations in 2011 were no more under the scope of the Directive and the information were updated to 7

Table 43 Strategic noise mapping methods used in R1 and R2 – Bulgaria

Noise source/type	Method
Road	French NMPB Routes-96
Railway	Dutch SRM II - 1996
Aircraft	international ECAC.CEAC Doc. 29
Industrial	ISO 9613-2

4.6.4 Public accessibility of SNMs

The SNMs and NAPs are available to the public on the website of the Bulgarian Executive Environment Agency[31].

4.6.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 44 Strategic noise mapping issues - Bulgaria

R1	R2
• Absence of common noise level calculation methods • Lack of required input data • Cost of SNM development • Lack of domestic noise experience and expertise • Length of necessary legal procedures	• Lack of required input data. Data collection, data consistency was the main challenge. • Length of necessary legal procedures and tendering. • Absence of common methods for calculation of noise levels • Lack of domestic experience and expertise to address noise issues

[31] available in Bulgarian http://eea.government.bg/bg/dokladi/noise

4.7 Noise action planning

4.7.1 Overview

An overview of NAPs is shown in the table below.

Table 45 NAPs – Bulgaria

	R1	R2
Agglomerations	3	4 (7)
Major airports	n/a	n/a
Major railways	no data	no data
Major roads	1	1

Source: Eionet[32] website and Bulgarian Executive Environment Agency[33]

4.7.2 Methodologies for noise action planning

The Law on Protection from Environmental Noise regulates "the development of NAPs based on the results of enrolment with a view to preventing and reducing environmental noise, especially in cases where exceedance of values set for noise levels can cause harmful effects on human health, or to preserve noise values quality where it is good. NAPs are prepared for the management of environmental noise, including taking steps to reduce it, if necessary. Decree № 217 from 18.08.2006 sets out the methodology that should be used for noise action planning.

4.7.3 Measures

Priorities have been set at local level. NAPs must provide an analysis of the current situation, forecasts and measures to reduce and prevent noise associated with the exceedance of limit values. The measures of the NAP are an integral part of the municipal programme for environmental protection. "Measures" are defined as organisational, economic or technical solutions relating to the prevention and reduction of environmental noise, excluding a specific technology model trademark, patent, type, origin or production. The measures can relate to planning land use systems, the design and planning of traffic and noise reduction through measures for sound-proofing and the control of noise sources.

Table 46 Sofia Airport noise mitigation program, 2006

Activity	EUR
Noise monitoring system	250,000
Noise insulation of 106 primary schools;	50,000
Noise insulation of resident buildings within western part of hygiene protective area (HPA)	350,000
Noise insulation of resident buildings within the eastern part of the HPA	30,000
Noise protection fence on the engine run-up pad	2,500,000
Total	**3,180,000**

[32] http://cdr.eionet.europa.eu/bg/eu/noise

[33] http://eea.government.bg/bg/dokladi/noise

4.7.4 Public consultations

Drafts of NAPs are published on the websites of the CA 30 days before the public consultation is scheduled to take place. The CA notifies the public through the media or by other appropriate means and provides a link to the draft NAP and informs the public about the date, time and place where the public discussion will take place. The public may then present their views in writing no later than 7 days after the date of the public meeting. The opinions expressed during the public consultation or afterwards in writing are then taken into account by the CAs when developing the final version of the NAPs. The CA provides public access to approved SNMs and approved NAPs by making these available online.

The minutes from public consultations organised in accordance with the Law on protection against noise the environment are included in a dedicated chapter in the NAPs.

4.7.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with any subsequent actions taken to address them, and new issues raised during R2.

Table 47 Noise action planning issues - Bulgaria

R1	R2
Plans for implementation of the NAPs were under development in 2010	There are no clear obligations to implement measures to protect residents from noise caused by rail transport and interurban bus transport, such as building noise insulation barriers along/ close to railway lines and bus stations
	The Mayor as the representative of the local authority and responsible for environmental noise levels should have the ability to require noise sources to adopt measures to reduce noise levels around the territory under their responsibility. However, this is not currently the case.
	The main challenges were in aligning the proposed measures in the draft NAP with the existing noise action plan and with local planning strategies

5. CROATIA

5.1 National implementing legislation for END

5.1.1 Legal implementation

The Noise Protection Act (OG 30/09, 55/13, 153/13) transposes the END at national level, supported by a number of ordinances, including Ordinance OG 75/09 on the method of preparation and content of SNMs and NAPs, and Ordinance OG 145/04 establishing noise limit values for the environment in which people live and work.

The most recent addendum to the Noise Protection Act (OG 153/13) defines delivering of the data about SNMs and NAPs (DF tables and corresponding data) to the competent authority, where the records should be kept, and then be reported further on to the European Commission/EEA.

5.1.2 Scope of END implementation – Rounds 1 & 2

Croatia only became a member of the EU in 2013, and was therefore not subject to Round 1 of noise mapping and action planning.

Round 2 (Croatia's *de facto* Round 1) covered 4 agglomerations, and approximately 44 km of major railway lines and 1,270 km of major roads.

Table 48 END coverage – Croatia

Round	Agglomerations	Major airports	Major rail	Major roads
1	n/a	n/a	n/a	n/a
2	4	n/a	44 km	1,270 km

5.2 Competent Authorities and designated administrative bodies

The national Competent Authority is the Ministry of Health. The Ministry is responsible for the collection and reporting of data related to SNMs and NAPs to the European Commission/EEA in collaboration with the Croatian Environment Agency (EIONET NFP). The organisations responsible for the production and approval of noise maps and action plans in Croatia are shown in the table below.

Table 49 Administrative Responsibility for the END - Croatia

Role	Agglomerations	Roads	Railways	Airports
Producing and approving strategic noise maps and action plans	City of Zagreb City of Split City of Rijeka City of Osijek	Croatian Motorways Croatian Roads Motorway Rijeka – Zagreb Motorway Zagreb – Macelj Motorway Bina Istra	Croatian Railways	Croatian Civil Aviation Agency
EC/EEA reporting	Ministry of Health			

5.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

5.3.1 Data collection

The Noise Protection Act (OG 30/09, 55/13, 153/13) transposes the END's definitions of agglomerations, major roads, major railways and major airports. Agglomeration borders are aligned with the administrative borders of cities with more than 100,000 inhabitants. The number of inhabitants for each agglomeration is publicly available from the Croatian bureau of statistics on the basis of the 2011 census of population, households and dwellings.

Data to delimit major roads, major railways and major airports are available from the Croatian Motorways, Croatian Roads, Motorway Rijeka – Zagreb, Motorway Zagreb – Macelj, Motorway Bina Istra, Croatian Railway and Croatian Civil Aviation Agency.

5.3.2 Implementation issues

Croatia's Round 2 reporting was delayed. A summary of issues raised as a result of END implementation in Round 2, together with actions taken to address them are shown in the table below.

Table 50 Designation issues - CROATIA

Issue	Action
Financial: A lack of funds SNMs and NAPs meant responsible authorities generally failed to deliver results on-time.	The competent authority has insisted on development of binding 3-year financial and project plans for delivering strategic noise maps and action plans.
Availability of the input spatial data: Digital terrain and digital surface models are available from the State geodetic administration. Building footprints are available through National cadastre on the national level, while the building heights exists mainly within agglomeration boundary.	The CA has required datasets used for previous Rounds to be updated for Round 3 (to ensure continuity and consistency).
Availability of the input traffic data	Road traffic data mainly exists within the database of the responsible authority, while the Croatian railways has necessary data about railway traffic.
Insufficient collaboration between stakeholders	The competent authority actively promotes collaboration between responsible administrative bodies when developing SNMs and NAPs in agglomerations where multiple major sources must be mapped.
Data reporting	Due to the recent change in the EC reporting mechanism and shift to ENDRM, the competent authority, in collaboration with EIONET NFP, has defined the (new) procedure in the latest addendum to the Noise Protection Act (OG 153/13).

5.4 Noise limits and targets

5.4.1 Scope

Ordinance OG 145/04 establishes maximum noise levels in working and living environments:

- day (07.00-19.00), evening (19.00-23.00) and night (23.00-07.00)
- L_{day}, and L_{night}

Table 51 Summary of limit values for noise – Croatia

Noise zone	Land use	L_{day} and $L_{evening}$ (dB(A))	L_{night} (dB(A))
1.	Hospitals and recovery	50	40
2.	Residential	55	40
3.	Mixed - mainly residential	55	45
4.	Mixed - mainly commercial and business, with housing	65	50
5.	Production with no housing	80 (within the zone) *In line with neighbouring area values at borders*	80 (within the zone) *In line with neighbouring area values at borders*

The Ordinance on the method of preparation and content of noise maps and action plans (OG 75/09) in the process of noise mapping requires maps to indicate where limit values have been exceeded as a basis for the preparation of NAPs. It also requires existing noise limits directly related to the land use documents for the relevant municipality or agglomeration to be used. These are used on conjunction with other parameters determined by the responsible bodies.

5.4.2 Purpose

The purpose of setting noise limit values is to avoid noise nuisance and protect human health and well-being.

5.4.3 Non-binding target values

There are currently no non-binding target values.

Implementation issues

The WHO's health-based assessments were not used in Croatia.

No issues were raised in relation to noise limits and targets.

5.5 Quiet areas

Quiet areas are defined in Article 2 of Noise Protection Act (OG 30/09, 55/13, 153/13), which distinguishes between:

- Quiet area in an agglomeration - a noise protection area, delimited by the competent authority, which is not exposed to a value of L_{den} or of another appropriate noise indicator greater than a certain value laid down in special regulations on relevant limit values of noise
- Quiet area in open country - a noise protection area, delimited by the competent authority, that is undisturbed by noise from traffic, industry or recreational activities.

There is no evidence of quiet areas in agglomerations and in open country in Croatia having been delimited so far. It can be expected that criteria for a "Quiet area in an agglomeration" will be developed during development of the NAP of the agglomerations.

5.6 Strategic noise mapping

5.6.1 Overview

An overview of SNMs produced in Round 2 is provided below.

SNMs have now been developed for all agglomerations with more than 100,000 inhabitants.

The tender for preparation of a SNM and NAP for the major railway has been awarded, and the exercise is currently being carried out – see * in the table below.

The third and final map covering major road outside agglomerations is currently being prepared - see ** in the table below.

Table 52 SNMs – Croatia

	R1	R2
Agglomerations	n/a	4
Major airports	n/a	n/a
Major railways	n/a	1* (44 km)
Major roads	n/a	3** (1,270 km)

5.6.2 Data collection

Data were not collected centrally for strategic noise mapping, and significant efforts were necessary to obtain them.

Some of the data (like building footprint from State Geodetic Administration) were very hard to collect at a national level, with major problems being synchronisation of their collection between different road authorities, and some not being collected at all, for example traffic speed and composition at night.

Table 53 Data collection - Croatia

Nature of data	Responsible body
Major agglomerations	City authorities (excluding roads not managed by them)
Major railways	Croatian railways
Major roads	Relevant responsible administrative bodies (including roads within agglomerations)
Digital terrain and surface models	State geodetic administration
Building footprints	State geodetic administration - national cadastre*

** A **cadastre** is a comprehensive register of the real estate or real property's metes-and-bounds of a country*

5.6.3 Strategic noise mapping methods

SNMs and NAPs for Rounds 2 and 3 in Croatia are to be produced by using "interim" methods provided in Annex II of the END and Recommendations 2003/613/EC.

Table 54 Noise mapping methods used in Round 2 and 3 - Croatia

Noise source/type	Method
Road	French NMPB
Railway	Dutch RMR
Aircraft	International ECAC
Industrial	ISO 9613-2

5.6.4 Public accessibility of SNMs

Depending on the responsible body, SNMs and NAPs are publically available on websites, either through web gis applications or documents in pdf format. Example web GIS applications are:

- Agglomerations:
  - City of Zagreb - https://geoportal.zagreb.hr/Karta (" Katalog slojeva" ➔ "Strateška karta buke")
  - City of Osijek - http://bit.ly/skbos
  - City of Rijeka - http://www.kartebuke.com.hr/pmapper32/map.phtml?config=rijeka
- Major Roads:
  - Croatian Motorways - http://bit.ly/hac_skb
  - Motorway Zagreb – Macelj - NAP - http://azm.hr/obavijesti.asp?oID=10&lang=

5.6.5 Implementation issues

A summary of issues raised as a result of END implementation in Round 2, together with actions taken to address them are shown in the table below.

Table 55 Strategic noise mapping issues during Round 2 – Croatia

Issue	Action
Collection of geospatial data on national level	Improve collaboration with the State Geodetic Administration
Building footprints exist within the national cadastre. However, statuses may not correspond to the real situation (the data have not been updated) with respect to the assessment years of END. There is no national database about building heights and use. There are no regular updates on developments (new buildings, change of building use etc.).	Ongoing issue
Collection of source related data (road traffic data, railway data)	Closer collaboration between the responsible bodies. A binding list of bodies responsible for the collection data for Round 3 is being prepared
Validation of the SNMs (noise levels)	Implementation of an accreditation scheme for noise mapping specialists and acoustics laboratories in accordance with the ISO 17025
Usage of interim noise assessment methods	The default rail noise emission data used for noise mapping has some inaccuracies, causing some noise maps to be corrected to ensure comparability with long-term and noise emission measurements. Development of a national emission catalogue for the railway is an option.

5.7 Noise action planning

5.7.1 Overview

An overview of NAPs is shown in the following table.

NAPs are currently being completed for one agglomeration and one major road - see * in the table below.

A NAP for the major railway is currently being prepared – see ** in table below. Outstanding plans are either in the tendering process or being planned.

Table 56 NAPs – Croatia

	R1	R2
Agglomerations	n/a	1*
Major airports	n/a	n/a
Major railways	n/a	1**
Major roads	n/a	1*

5.7.2 Methodologies for noise action planning

Croatia uses END provisions for action planning, as transposed by Ordinance OG 75/09 and annexes.

No guidelines have been developed at any administrative level.

5.7.3 Measures

Experience of END action planning is very limited as Croatia has only produced plans from Round 2. Development of (Round 2) NAPs will lead to the application of standard technical measures at noise source and traffic and land-use planning. For example, the operator of a particular major road has indicated that no NAPs were prepared previously, but that they are planning the construction of noise barriers on the basis of project documentation using acoustic calculations. In the case of existing highways, priorities have been established in response to complaints raised in correspondence.

5.7.4 Public consultations

Action Plan proposals are made available to the public via the websites of responsible administrative bodies. During public hearings, there has been a commitment to ensuring public access to strategic noise and exceedance maps as a starting point of action planning process.

5.7.5 Implementation issues

Issues raised in Round 2, together with actions taken to address them are shown in the table below.

Table 57 Action planning issues - Croatia

Issue	Action
Lack of financial and human resources within administrative bodies to implement the END Insufficient budget to implement noise action planning tasks (Lack of) Availability of finance to implement measures identified in action plans	No actions taken.

6. CYPRUS

6.1 National implementing legislation for END

6.1.1 Legal implementation

In Cyprus, the END was transposed through Law 224 (1) of 30 July 2004 on the assessment and management of environmental noise, and Act 31 (1) of 17 March 2006 amending, amending law 75 (1) of 29 June 2007.

6.1.2 Scope of END implementation – Rounds 1 & 2

The implementation of the END Directive is based on the application of Law 224 (1) of 30 July 2004 on the assessment and management of environmental noise, and Act 31 (1) of 17 March 2006 amending, amending law 75 (1) of 29 June 2007. Furthermore, subsequent Ministerial Decrees define the major agglomerations, airports and major roads[34][35] and approved the strategic maps developed for the major roads[36].

Law 224 (1) of 30 July 2004 provides for the establishment of noise limits, quiet areas within agglomerations and open country and sets out a timetable for the delimitation of major airports and major roads, the development of SNMs for the major roads and airports (30.06.2007), delimitation of major agglomerations (31.12.2008) and development of all relevant actions plans (18.07.2009). The notification of the list of major airports and roads to the Commission was due to take place by 30.06.2010[37].

R1 of strategic noise mapping and noise action planning in Cyprus covered 231 km of major roads, predominantly part of the road network inside or adjacent to the four largest towns (Nicosia, Larnaka, Limassol and Pafos). A NAP was developed for each of these agglomerations respectively in 2007.

The introduction of definitive thresholds in R2 triggered the development of SNMs for roads with over 3 million vehicles passing and the agglomerations (30.06.2012) and the development of the respective actions plans by 18.07.2013. This round has also assessed noise from industrial activities in both agglomerations.

Thus, as part of R2, SNMs have been developed for two agglomerations (Limassol and Nicosia), having a population in excess of 100,000 persons. Finally, as part of the development of SNMs for agglomerations, the major roads covered over 1,000 km in total.

This is summarised in the table below:

Table 58 END coverage – Croatia

Round	Agglomerations	Major airports	Major rail	Major roads
1	n/a	n/a	n/a	231 km

[34] http://www.moa.gov.cy/moa/environment/environment.nsf/All/F5BED63FCF495482C22578DC0028054B/$file/KDP333-2007.pdf

[35] http://www.moa.gov.cy/moa/environment/environment.nsf/All/F5BED63FCF495482C22578DC0028054B/$file/KDP45-2008.pdf

[36] http://www.moa.gov.cy/moa/environment/environment.nsf/All/F5BED63FCF495482C22578DC0028054B/$file/KDP186-2009.pdf

[37] http://www.moa.gov.cy/moa/environment/environment.nsf/All/684A1F8D92911C63C22578CE003BB0E1?OpenDocument

2	2	n/a*	n/a	> 1,000 km

Table 59 END coverage – Cyprus

Round	Agglomerations	Major airports	Major rail (km)	Major roads (km)
1	N/A	N/A*	N/A	231
2	2	N/A*	N/A	710 (within and outside agglomerations)

*Note *: two major airports (Larnaka and Pafos) were mapped in R1 and R2. However, according to the EEA spreadsheet, there was no formal requirement to map either of these airports since they do not have more than 50,000 movements per year, although in the case of Larnaca, they are close to the threshold.*

6.2 Competent Authorities and designated administrative bodies

The body responsible for implementation of the END in Cyprus is the Ministry of Agriculture, Rural Development and Environment.

6.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

6.3.1 Data collection

Data to help inform the designation and delimitation of sites was already available in 2005. No specific data collection problems were identified in R2.

6.3.2 Implementation issues

Table 60 Designation issues – Cyprus

R1	R2
Reporting road start and end nodes (x, y) as there is not yet an electronic GIS system to have the major roads as shape files	No issues.

6.4 Noise limits and targets

Even though Law 224 (1) of 30 July 2004 provides for the establishment of noise limits, to date, no such limits have been set. The Department of Environment will propose noise limits in consultation with the Legal Service in order to prepare the legal framework and will follow the regular procedure for approval.

6.4.1 Noise limit values

There are no noise limit values in force in Cyprus. As part of the SNMs developed for R1, possible limits of L_{den}=70dB(A) and L_{night}=60dB(A) for roads were considered but no action has yet been taken.

As part of the SNM and NAP developed for the airport of Larnaca[38], the following scenarios for possible limits were examined:

- For the 2008–2012 period: (criterion A) L_{den}≤70 dB (A) and L_{night}≤60 dB (A)
- After the 2012 period: L_{den}≤65 dB (A) and L_{night}≤55 dB (A).

However, these proposals have not yet been adopted (as of April 2016).

6.4.2 Non-binding trigger thresholds

There are no trigger thresholds in force in Cyprus.

6.4.3 Methods for establishing noise limit values

Law 224 (1) of 30 July 2004 as amended thereafter defines the methods for establishing noise limit values for L_{den} and Lnight indicators on the basis of ISO 1996-2 standard: 1987. The Law stipulates that measurements for the purpose of Strategic noise mapping should take place 4 (±0.2) m above ground. The proposed methodology for road traffic noise is the French method «NMPB−Routes−96 (SETRA−CERTU−LCPC−CSTB)». For air traffic noise, the proposed method is ECAC.CEAC Doc. 29 "Report on Standard Method of Computing Noise Contours around Civil Airports", 1997. Railway noise mapping is not applicable since Cyprus does not have any major railways where the END thresholds have been reached.

6.5 Quiet areas

6.5.1 Overview

Law 224 (1) of 30 July 2004 defines two types of quiet areas, in agglomerations and in open country. Quiet areas in agglomerations are areas that are not exposed to noise levels above a certain limit for the indicator L_{den} that should be set by law. However, no such limit has been set to this point.

In relation to quiet areas in open country, the law states that these should be areas that are not affected by noise from traffic, industrial or leisure activities.

Delimitation

At this stage, there are no quiet areas delimited in Cyprus. As part of R1 the authorities noted that since they did not have to prepare SNMs for agglomerations they were not able to identify quiet areas. The development of SNMs of R2led – as part of the NAPs - to proposals for the development of a quiet area in Nicosia, only.

Protection

As indicated above, no quiet areas have been delimited and no protection measures have been adopted.

Agglomerations

No quiet areas have been delimited in agglomerations.

[38] Vogiatzis, K., (2012), Airport environmental noise mapping and land use management as an environmental protection action policy tool. The case of the Larnaka International Airport (Cyprus), Science of the Total Environment 424 (2012) 162–173

Open country

No quiet areas have been delimited in open country.

6.5.2 Implementation issues

The Even though scope is provided in the relevant Law to delineate quiet areas, no such areas have yet been designated.

6.6 Strategic noise mapping

6.6.1 Overview

An overview of the position in respect of strategic noise mapping.

Table 61 SNMs – Cyprus

Round	Agglomerations	Major airports	Major railways	Major roads
1	0	0(*)	0	1
2	2	0 (*)	0	1

** Note: in respect of airports, it should be noted that although mapping has been undertaken in two airports on a voluntary basis, the airports are not yet formally within the END's scope due to aircraft movements being below the thresholds.*

6.6.2 Data collection

No specific guidelines have been laid down at national level. Data were gathered in paper and electronic formats in cooperation with relevant government departments and local authorities.

For R2, the data collection and mapping built on digital terrain models (DTM) with the use of a Geographical Information System (GIS) for the two agglomerations and the road network was developed by the consultants responsible for the study. Data from the Land and Surveys Department, in situ survey and satellite data were combined to determine building blocks, relevant land uses, sensitive uses (e.g. schools, churches, health centres) and estimates of the population affected. Relevant road traffic data from the Department of Public Works, the Department of Town Planning and Housing and the Local Authorities was also used. Statistical data on the 2011 census was collected from the Statistical Service.

Noise data was collected on the basis of 24h noise measurements for the various indicators, including L_{den}, L_{day}, $L_{evening}$, L_{night}, L10(18h) and L_{eq} (8-20hrs). Specifically, 85 24h noise measurements (50 in Nicosia and 35 in Limassol) were undertaken with the use of mobile noise measurement stations. These measurements were also compared against the results from the theoretical model.

Overall, R2 SNMs covered a much greater road network length and population than in R1, as shown in the following table.

Table 62 Coverage of SNMs by Limassol and Nicosia SNMs

Round	Lemessos			Nicosia		
	Road length (km)	Area covered (Km2)	Population covered	Road length (km)	Area covered (Km2)	Population covered
1 (2007)	70	16.5	129,800	117	42.6	170,034
2 (2013-14)	1,101	67.5	187,214	1,495	97.9	243,254

Source: Presentation of external consultants responsible for the two studies

In addition, in 2010, SNMs were developed for two international airports (Larnaka and Pafos) – even though they do not exceed the 50,000 movements/year limit threshold for the END. These airports were mapped voluntarily. In the case of Larnaka, the number of aircraft movements per year was very close to the END minimum threshold[39]. Since there are airport expansion plans, there was an interest in undertaking noise mapping among the public authorities and private operators that have recently taken over ownership. Hence, some work has been done in order to assess noise levels at these airports. Aircraft traffic data were used together with 24hs measurements at different locations around the airports with the use of mobile noise measurement stations. Furthermore, alternative future scenarios for air traffic were developed for the two airports (2018 for Larnaka and 2020 for Pafos). This reflects the transfer to private ownership and the possibility of future expansion.

6.6.3 Strategic noise mapping methods

The 2007 Good Practice Guide has been used as well as "State of the art report on Strategic Noise Mapping (EEA/ETC-LUSI, 2005)", Environmental Noise Data Reporting Mechanism Handbook (2007) and the "Report Network Delivery Guide".

The consultant that produced the noise maps used a combination of 24h noise measurements for the various indicators, including L_{den}, L_{day}, $L_{evening}$, L_{night}, L10(18h) and L_{eq}(8-20hrs).

6.6.4 Public accessibility

The presentation of SNMs to the public is envisaged, based on national guidelines.

The SNMs developed as part of R1 and R2 are currently accessible to the public via the website of the Department of Environment[40]. The SNMs for the two airports of Larnaca and Pafos – with the respective studies - are also available[41] and the most recently developed noise maps are expected to be made available once the relevant studies have been completed.

[39] See Table 1, Aircraft movements and passengers at Larnaka Int. airport (2004–2008), http://www.cesruc.org/uploads/soft/130308/1-13030Q55016.pdf

[40] www.moa.gov.cy/moa/environment/environment.nsf/0/1fefe293f3754b37c2257948003df5a7?OpenDocument&ExpandSection=1#_Section1

[41] www.moa.gov.cy/moa/environment/environment.nsf/0/49a83895fbef6b43c2257995003e282a?OpenDocument&ExpandSection=1#_Section1

6.6.5 Implementation issues

Table 63 Strategic noise mapping issues - Cyprus

R1	R2
A lack of sufficient information "in electronic format". Cyprus is working on this in cooperation with relevant government departments	There is significantly more information currently available as a result of the studies already completed or in the completion process. However, there is no infrastructure developed and no noise monitoring system in place. Any future SNMs will require new measurements.

6.7 Noise action planning

6.7.1 Overview

The table below presents an overview of the NAPs produced in Cyprus in Round 1 and 2.

Table 64 NAPs – Cyprus

Round	Agglomerations	Major airports	Major railways	Major roads
1	0 (2)	0	no data	no data
2	0 (2)	2	no data	no data

6.7.2 Methodologies for noise action planning

During R1 there were no national guidelines for drawing up and implementing NAPs. Maps from 2006 were used as the basis for developing the 2008 NAPs. By using these maps, the authorities were able to determine which areas suffered from the greatest noise problems. The exceedance of noise limit values was used as a basis for establishing NAP priorities.

Health-based assessments were not referred to in establishing noise limit values. In some cases, complaints from residents in particular areas were used as the basis for deciding whether NAPs would be developed for those areas. Priorities were set at the local level.

6.7.3 Measures

The proposed noise reduction measures in R1 NAPs for major roads included installation of noise barriers along the sensitive users (schools and universities), application of stricter regulations on reducing noise of vehicles, exploitation of traffic routes to improve traffic flow, reduction of speed in critical ways, intervention on infrastructure by purification of the technical characteristics, reorganisation of the studied urban fabric region and special sound-absorbing construction of buildings.

The proposed **noise reduction measures** in R2 NAPs included: traffic planning, noise barriers and introduction of other transport means like tram and electric buses. The main criteria for selecting measures were: population exposure, implementation costs, and compatibility with other legislation.

The NAPs for the two airports – prepared on a voluntary basis - also included the establishment of a special phone hotline through which citizens will be able to acquire information and submit complaints.

6.7.4 Public consultations

Law 224 (1) requires that the NAPs are subject to public consultation. Before the adoption of R2 NAPs, the Department of Environment carried out information days in Nicosia and Limassol and uploaded all the relevant information onto its website to allow for electronic comments by the public. The public was also consulted on proposals for R1 NAPs, again through information days.

The earlier NAPs of R1 and for the two airports were made also available to the public through the website of the Department of Environment.

6.7.5 Implementation issues

Table 65 Noise action planning issues - Cyprus

R1	R2
NAPs should be revised at the minimum every eight years rather than every five years as now Responsible authorities used 100-150 man hours for drawing up NAPs, with an estimated cost for their implementation of 16-19 million Euros. A lack of adequate budget to follow through on the NAP was a concern. Inter-departmental inconsistencies	The same noise barriers identified in R1 were proposed in R2. The implementation of other noise measures such as improving existing roads or the introduction of other transport modes (trams, electric buses) fall under the responsibility of other departments, thus there is a need of coordination by the Department of Environment. A lack of adequate budget to follow through on the NAP was again a concern.

7. CZECH REPUBLIC

7.1 National implementing legislation for END

7.1.1 Legal implementation

The END's requirements have been transposed by several distinct laws, the most important of which are:

- Law 258/200 (Coll.) on the protection of public health (as amended by Law 392/2000 Coll. and Law 222/2006 Coll.)
- Regulation 523/2006 on noise limits, Strategic noise mapping, Noise action planning.

Although in the views of some stakeholders, this approach has created considerable legal complexity and made it harder for public bodies to implement and administer the relevant provisions of the END, the Competent Authority noted that there is a distinction between separating the strategic approach under the (END) and operational statutory supervision in public health safety against environmental noise which is the subject of a separate Regulation (Regulation 272/2011).

In planning and implementing the Directive, the Czech authorities referred to the 2007 Good Practice Guide (GPG) for Strategic noise mapping and the Production of Associated Data on Noise Exposure, presentation of Strategic noise mapping to the public, Environmental Noise Data Reporting Mechanism Handbook (2007) as well as the Reporting Network Delivery Guide.

7.1.2 Scope of END implementation – Rounds 1 & 2

Table 66 END coverage – Czech Republic

Round	Agglomerations	Major airports	Major rail	Major roads
1	3[42]	1	300 km	1,370 km
2	7	1	1,202 km	3,521 km

7.2 Competent Authorities and designated administrative bodies

The main bodies responsible for implementing the legislation are the Ministry of Health (and affiliated agencies), the Ministry of Transport (and affiliated agencies), and regional authorities.

The production of SNMs has been assigned to several professional commercial organisations that were selected by means of a public tender.

[42] Brno, Ostrava, Prague

Table 67 Administrative Responsibility for the END in the Czech Republic

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Institute of Public Health Ostrava (ZUOVA)*			
Approving SNMs	Ministry of Health			
Preparing NAPs	Ministry of Transport** Regional authorities	Ministry of Transport** Regional authorities ***	Ministry of Transport	Ministry of Transport
EC/EEA reporting	Ministry of Health			

* *With private contractors*

** *I. Class road*

*** *II. and III. Class roads*

7.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

7.3.1 Data collection

Data from various sources was used in both rounds to develop SNMs. A digital terrain model as well as part of the data on buildings was extracted from the map layer ZABAGED (ČUZK- State Administration of Land Surveying and Cadastre) system. Most of the data on the location and height of buildings was obtained from local municipalities. In the case of main roads and railways, the height of buildings was calculated based on the number of stories. Population data, and data on the location of educational facilities was obtained from the Czech statistical office (ČSU). Data on roads was obtained from ZABAGED and the Directorate of roads and motorways (ŘSD), which was also the source of data on traffic intensity and its composition. Data on the location of railways and train traffic was obtained from the Railway administration (SŽDC). Airport parameters and flight data was provided by the Praha-Ruzyně Airport (LKPR). Data on healthcare facilities was provided by the Ministry of Health. Data accuracy was checked with the help of aerial photos (ortofoto maps provided as WMS by CUZK) and field inspections.

As of 2010, no complex digital maps of the rail network existed, but the methods used in the preparation of data for SNMs could be utilised to transform existing data into GIS format. The software programmes CadnaA and LimA were used to address data gaps regarding the terrain along the tracks. The use of GIS is thought to be extremely important in creating SNMs of the required quality.

7.3.2 Implementation Issues

The issues raised in the R1 legal implementation review and in R2 are shown in the table below.

Table 68 Designation issues – Czech Republic (R1 and R2)

R1	R2
Problem with address centroid accuracy	Problem in addressing centroid accuracy.
Problem with emission data acquisition from industry.	Problem with emissions data acquisition from industry.
Train emission data were not available.	Train emissions data were not available.
Need to strengthen the precision of digital data about the terrain, building location and road and railway position.	Bad precision of digital data about the terrain, building location and road and railway position. It was improved by checking against the "ortofoto" maps.
Need for data validation of road surface and its acoustical properties.	Need for data validation of road surface and its acoustical properties.
Location of noise barriers and their properties.	Location of noise barriers and their properties.

7.4 Noise limits and targets

7.4.1 Objectives and Scope

Limit values for noise indicators (trigger limits) are set for the purpose of preparing NAPs for noise protection. Based on the limit values, problematic areas are identified along with proposed measures for reducing the noise load from individual sources. The measures adopted must relate to compliance with environmental noise limits defined in Government *Regulation 272/2011 Coll.: On health protection against adverse effects of noise and vibration.*

Table 69 Noise limit values – Czech Republic

Noise source	Noise limit values	
	Day dB (A)	Night dB (A)
Road traffic	70	60
Rail traffic	70	65
Air traffic	60	50
Industry	50	40

Source: Article 2(3) of Regulation 523/2006 (Coll.)

For the purpose of monitoring noise in the outdoor environment and operational statutory supervision, noise parameters and limits are specified in *Government Regulation no. 272/2011 Coll.* According to this Regulation, an A-weighted equivalent sound pressure level for the reference time interval by day and night is the determining variable for noise in the outdoor environment.

Permissible values are set for different territorial categories. The default value for the external environment is set at 50 dB in accordance with the regulations. This is used as a determining factor for all noise sources equivalent sound pressure level (mean level) intended for the reference time interval day and night. These limits are obligatory and enforced through the threat of penalties.

If, in extreme cases, the use or operation of a sound source is not in compliance with the permissible values of the determining parameter, then the owner of that source is allowed to operate only with permission by the CA for health protection. Temporary permits for operating such a source can be issued by the CA if the owner or the operator demonstrates that the noise will be reduced to the extent possible.

With regard to long-term exposure of noise emitted by road traffic, limit values are set for the reference period day (from 6.00 to 22.00 hours) and night (from 22.00 to 06.00 hours the following day). Three types of protected external zones are recognised. Specific limits are set for class III roads and class III local roads; for motorways, class I & II roads and class I& II local roads; as well as for roads where traffic noise dominates noise from other transportation lines (railway and tramway transport, transport on class III roads).

Noise limits in protected outdoor areas under Czech legislation:

A. Environmental exposure limits for noise from road traffic on Class III roads and class III local roads:

1. Protected outdoor space of healthcare facility structures with wards, including spas (2 m in front of a facade)
    a. Day - $L_{Aeq,p,d}$ = 50 dB;
    b. Night - $L_{Aeq,p,n}$ = 40 dB;
2. Protected free outdoor area of healthcare facilities with wards, including spas
    a. Day - $L_{Aeq,p,d}$ = 50 dB;
    b. Night - $L_{Aeq,p,n}$ = 50 dB;
3. Protected free outdoor area of other structures
    a. Day - $L_{Aeq,p,d}$ = 55 dB;
    b. Night - $L_{Aeq,p,n}$ = 55 dB;
4. Protected outdoor space of other protected outdoor space (2 m in front of a facade)
    a. Day - $L_{Aeq,p,d}$ = 55 dB;
    b. Night - $L_{Aeq,p,n}$ = 45 dB;

B. Environmental exposure limits for noise from road traffic on highways, class I & II roads and class I & II local roads.

1. Protected outdoor space of healthcare facility structures with wards, including spas (2 m in front of a facade)
    a. Day - $L_{Aeq,p,d}$ = 55 dB;
    b. Night - $L_{Aeq,p,n}$ = 45 dB;
2. Protected free outdoor area of healthcare facilities with wards, including spas
    a. Day - $L_{Aeq,p,d}$ = 55 dB;
    b. Night - $L_{Aeq,p,n}$ = 55 dB;
3. Protected free outdoor area of other structures
    a. Day - $L_{Aeq,p,d}$ = 60 dB;
    b. Night - $L_{Aeq,p,n}$ = 60 dB;

4. Protected outdoor space of other protected outdoor space (2 m in front of a facade)
    a. Day - $L_{Aeq,p,d}$ = 60 dB;

    b. Night - $L_{Aeq,p,n}$ = 50 dB;

C. Environmental exposure limits for old noise load, traffic noise on highways, class I, II & III roads and local roads, with the exception of traffic on private roads.

The limits of the so-called old noise load on the all roads is equal to the equivalent noise level that was in place until 01.01.2001 ("old" roads). In the case that noise exposure exceeds the "regular" limits according clause A and B above and does not exceed the level of 70/60 dB in daytime/night time, this exposure i.e. limit can be temporarily tolerated, until such time as it increases by up to 2 dB. If noise increases beyond this limit, then the old noise load can no longer be applied and only the "regular" limits are valid.

1. NOTE: The limits shown above are also valid for railways with the exception of night limits, which are adjusted up by +5dB correction increments.

7.5 Quiet areas

7.5.1 Overview

Quiet areas in open country should be determined by the Ministry of Environment. Quiet areas in agglomerations should be defined by individual regional authorities. The requirements for quiet areas in open country have not yet been established by the Ministry of Environment.

No quiet areas were designated in the context of preparing NAPs to date.

There are no legally-specified noise limits for quiet areas.

7.5.2 Implementation Issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 70 Quiet area issues: Czech Republic

R1	R2
The criteria based on DEFRA 2006 "Research into quiet areas, recommendations for identification" were presented and disseminated to the NAP CA	Some criteria for open country have now been proposed, but have not yet been legally implemented: • luxury: L_{day} & L_{night} < 40 • comfortable: L_{day} < 50, L_{night} < 40 • good: L_{day} < 55, L_{night} < 45 • acceptable: L_{day} < 60, L_{night} < 50 • unfavourable: L_{day} > 60, L_{night} > 50
Lack of legally specified noise limits for quiet areas, the quietness in agglomerations is relative and should be processed individually	Legal instruments at national level are still lacking to create and protect quiet areas in nature

7.6 Strategic noise mapping

7.6.1 Overview

An overview of the number of SNMs that were originally envisaged, meant to be reported to the EC and which have actually been reported is now presented.

Table 71 SNMs – Czech Republic

	R1	R2
Agglomerations	22	62 (62)
Major airports	2	2 (2)
Major railways	2	2 (2) (1,202 km)
Major roads	2	26 (26) (3,521 km)

The Ministry of Health[43] has overall responsibility for strategic noise mapping but is assisted by a range of public and private sectors organisations.

Table 72 R1 SNM preparation – Czech Republic

Organisation	NM / Role
ZUOVA	Railway network
	Ostrava agglomeration
	Compilation of overall SNMs
ZUPU*	Roads in several regions (7)
Private organisations	Prague Airport, roads in several regions (6), Prague and Brno agglomerations

**ZUPU was joined with ZUOVA in 2010*

Table 73 People exposed to noise above L_{den} and L_{night} limits in 2006 – Czech Republic

Noise source	Limit value (L_{den})	People exposed to noise above L_{den} limit	Limit value (L_{night})	People exposed to noise above L_{den} limit
Road	70	226,700	60	278,800
Rail	70	14,800	65	600
Industry	50	652	40	1,406
Air	60		50	500

[43] Law 258 of 2000 (Coll.) on public health protection.

7.6.2 Data collection

The Ministry of Health was responsible for all data collection. The data collected were given to single SNM contractors.

The data required to carry out noise mapping was obtained from the following sources:

- Traffic intensity data from the Road and Motorway Directorate (RSD)
- Maps from the State Administration of Land Surveying and Cadastre (ČÚZK);
- Number of people in buildings from the Czech Statistical Office (ČSÚ).
- Land cover data from the Czech Environmental Information Agency (CENIA)
- Railway data form the Railway Infrastructure Administration (SŽDC)
- Airport data from the airport Praha Ruzyně (LKPR)
- Public transport data from individual municipalities
- Industrial noise data for IPPC sources from single Regional Authorities

Table 74 Strategic noise mapping – data availability and collection methods – Czech Republic

R1	R2
Spatial databases obtained from photogrammetry	Same approach adopted
Noise emission data from noise sources obtained by measurement, roads and railways data as mentioned above.	As above
Inhabitant data obtained from the census of the Czech Statistical Office.	As above

7.6.3 Strategic noise mapping methods

For calculation of SNM of roads the French method (NMPB-Routes-96 – SETRA-CERTU-LCPC-CSTB) was adopted in accordance with the Good Practice Guide for Strategic noise mapping (2006 version). Several existing data sources have been used when modelling the vicinity of the relevant roads.

For railway noise, the Dutch RMR2 rail noise method has been used. The RMR2 method was used for tram noise too. For industrial noise, ISO 9613-2 'Acoustics – Abatement of sound propagation outdoors, Part 2: General method of calculation' has been used.

The calculations were conducted in the CADNA A (Dataakustik) and LIMA (Stapelfeldt) programmes. Output included maps in the scale of 1:10 000 with noise exposure contours expressed as L_{den} and L_{night} using a colour coding scale.

The approach to produce the SNMs was the same in R1 and R2.

7.6.4 Prague

The SNM for the agglomeration of Prague was developed by Akustika Praha using data from local government and the Czech Statistical Office. A large number of data sources were used to compile data on road traffic, railway, and air traffic noise. For noise from industrial production, IPPC data have been used. For railway, road

transport, and air traffic noise the Dutch rail noise, French road noise and ECAC.CEAC air traffic noise methods were used. The RMR2 method was used for tram noise.

For industrial noise, ISO 9613-2 'Acoustics – Abatement of sound propagation outdoors, Part 2: General method of calculation' was used.

The programmes used for calculation and GIS were LimA C and B and GIS Kristyna.

The outputs were presented in maps with a scale of 1:35,000 displaying L_{den} and L_{night} contours.

7.6.5 Brno

The SNM for the agglomeration of Brno was developed by Akustika Praha using data provided by local government and the Czech Statistical Office. A large number of data sources were used to compile data on road traffic, railway, trams and air traffic noise. Information on industrial production was provided by local government. The same calculation methodologies were used as those used for noise exposure calculations in Prague. The final output was a map with a scale of 1:25,000.

7.6.6 Ostrava

SNM for the agglomeration of Ostrava were developed by ZUOVA. While maps were provided by the State Administration of Land Surveying and Cadastre (CUZK), the study team opted for using maps provided by the local government in Ostrava. This was complemented with data from the Czech Statistical Office. A large number of data sources were used to compile data on road traffic, railway, trams and air traffic noise. Information on industrial production was provided by local government using their IPPC register. The same calculation methodologies were used as those used for noise exposure calculations in Prague and Brno. The software used was LimA, ArcView, GIS Kristyna. The output is presented as maps with a scale of 1:30,000 and 1: 10,000 displaying L_{den} and L_{night} contours.

7.6.7 Strategic noise mapping methods

The END specified the interim computing methods for both the R1 and R2 of strategic noise mapping that have been used. Details were already described above.

7.6.8 Public accessibility of SNMs

Czech legislation[44] obliges the Ministry of Health to make SNMs available to the public in paper format and on its website.[45] At this stage, SNMs in paper format are available for inspection at the Ministry's Prague office. SNMs are also available online at:

http://www.geoportal.cenia.cz and http://hlukovemapy.mzcr.cz.

For R2 new map presentation has been prepared. Now (in April 2016) it is available on the address

https://eregpublicsecure2.ksrzis.cz/Registr/shm/ but the address will change soon. The text part will be available on the mzcr.cz web page.

[44] Paragraph 4 of Regulation 523/2006 Coll. on Noise Mapping

[45] http://www.mzcr.cz/Verejne/Pages/23-zverejnovani-udaju-o-shm-dle-vyhlasky-c-5232006-sb.html

7.6.9 Implementation Issues

A number of issues were raised as a result of R1, a summary of which is shown below. A number of further implementation issues were raised during R2.

Table 75 Strategic noise mapping issues – Czech Republic

R1	R2
Lack of precision on number of inhabitants per building	Issue remained problematic
Compatibility of datasets, e.g. from the Czech Statistical Office (CSU)) and the State Administration of Land Surveying and Cadastre (CUZK)	Delays in R2 were expected as funding yet to be allocated, and the need to comply with public procurement rules to engage private companies to compensate for a lack of internal resources means their appointment will take up to 12 months. Delay in SNM implementation due to slow public tendering processes. The complete set of SNMs are expected to be ready only by 30.06.2016.
Traffic intensity datasets for the reference year required by END (2006) had to be recalculated as national traffic intensity is surveyed in 5-year intervals (2005, 2010, etc.). The same problem was expected in 2011 (for R2)	
There was a challenge in integrating a wide variety of input data. Some data had to be manually prepared and adjusted.	

7.7 Noise action planning

7.7.1 Overview

Table 76 NAPs – Czech Republic

	R1	R2*
Agglomerations	260 (3 agglomerations)	0 (7 agglomerations)
Major airports	16	0 (1)
Major railways	5	0
Major roads	175	0

* *NAPs for R2 will be finished until the end of 2016*

The vast majority of R1 NAPs were adopted by local government bodies and the Ministry of Transport (or agencies falling under the Ministry's supervision, such as the Road and Motorway Directorate). In some cases, their preparation was subcontracted to commercial organisations.

7.7.2 Methodologies for noise action planning

The legislation (Annex III of Regulation 523 of 2006 Coll.) provides a brief overview of the desired content of NAPs, but no detailed requirements.

Guidelines on noise action planning were developed by the Centre for Transport Research in Brno (CDV), but their use is not compulsory.

NAPs were driven by the outcome of strategic noise mapping which were used to identify "hot spots" where noise limits were exceeded.

Priorities in the NAPs were set at national as well as regional levels.

When adopting measures, noise abatement was one of several criteria used, with transport effectiveness and safety being considered as well.

No changes have been made in the methodology between Rounds 1 and 2.

The national CA identified lack of common European guidelines for the development of NAPs as a problem since it has proved very challenging to develop robust NAPs. Guidance would be especially welcome in respect of the development of methods for undertaking cost-benefit assessment and to assess the costs of the implementation of NAP measures.

7.7.3 Measures

An overview of the types of measures adopted in NAPs is provided below. It should be noted that little information is available at this stage in respect of R2 implementation, since due to delays in public tendering processes getting underway, the R2 SNMs have not yet been completed, and therefore noise action planning is taking place too late in the process for information to be included in this country report.

Table 77 Noise reduction measures in R1 and R2 NAPs – Czech Republic

	R1	R2
Traffic planning	Yes	No info
Land-use planning	Yes	No info
Technical measures at noise source	Yes	No info
Economic measures	No	No info
Insulation	Yes	No info
Selection of quieter sources	Yes	No info
Reduction of sound transmission	Yes	No info
Regulation	Yes	No info
Incentives	No	No info

Table 78 R1 and R2 NAP measures – key selection criteria - Czech Republic

	R1	R2
Population exposure	2	1
Ease of implementation	2	3
Costs of implementation	2	2
Compatibility with other legislation	5	5
Noise source in the case of exceedance	2	2

Legend: 1 – very important criteria 5 – criteria of minimal importance. Based on discussions with national Competent Authority and wider stakeholders.

Stakeholders interviewed suggested that R1 NAPs may, in some cases, have included measures that had been planned regardless of the END, and noise abatement was not the main reason behind their adoption. For example, some infrastructure construction projects had been adopted for road safety reasons but where these projects also contribute to noise abatement, they have also been listed in NAPs. Thus, some measures contained in NAPs may not have been adopted in response to noise limits being exceeded, but for other reasons.

Since noise action planning for the R2 NAPs have not yet been adopted at all, it is at this stage impossible to form an overall judgment of the extent and effectiveness of anti-noise measures implemented on the ground.

Table 79 NAP cost estimates (EUR million)

	Measures*	Cost estimates (EUR million)
R1 (up to 2012)	12	37,000
R2 (after 2012)	No data**	No data**

Source: ZUPU

** Previous and planned expenditure over a 5 – 10-year horizon*

***The R2 NAPs are still under preparation, therefore no detailed information is available yet on measures and their costs.*

It can be noted that since the R2 NAPs are late, there is no data or information yet available with regard to R2 NAPs.

7.7.4 Public consultations

Public consultation was carried out prior to finalising NAPs. Consultation methods included notices being placed on boards at public authority offices as well as Internet presentations. In addition, some information was published in the media.

All the comments received from the public related to both Prague Airport (around 300) and noise action planning for the Prague agglomeration. Other NAPs received zero comments.

A summary of some of the comments received and a brief account of the manner in which they were incorporated into NAPs is available from the website of the Ministry of Transport.[46] This allows the public to check whether their comments have been taken up in the NAPs. However, this site does not seem to include all the NAPs currently in place across the country. NAPs were published on official notice boards and on websites of the regions. If there were any comments, they were discussed.

7.7.5 Implementation Issues

A number of issues were raised as a result of R1 and R2, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

[4646] http://www.mdcr.cz/cs/Strategie/Akcni_plany/akcni_plany.htm

Table 80 Noise action planning issues – Czech Republic

R1	R2
The period between finalising SNMs and completing NAPs was insufficient (12 months).	
The lack of more precise specifications as to what NAPs should contain	The CA reiterated the need for the EC to develop further guidance on noise action planning.
The lack of an impact assessment of the costs and benefits of measures adopted	No info at this stage in R2 since NAPs are delayed in CZ
It was a challenge working with input data. It will be easier producing NAPs with noise level assigned to every building in NAP.	
• Lack of financial resources • Lack of interest by CA • Problems with obtaining correct input data (incomplete, incorrect, wrong format)	Major delays in submission of R2 NAPs. Delays in R2 can be explained by the knock-on delays from noise mapping, specifically due to: • Lack of financial resources • Lack of interest among CAs • Problems with obtaining correct input data (incomplete, incorrect, wrong format) Currently, authorities are discussing how to improve the data situation for subsequent Rounds.
	The request for statistical data on the costs of SNMs and NAPs development and implementation, human resources, etc. should be collated by the Commission at the beginning of each single round of SNM. This would be useful for the purposes of monitoring but also evaluation.

8. DENMARK

8.1 National implementing legislation for END

8.1.1 Legal implementation

The Noise Directive was implemented based on the Environmental Protection Act by issuing Executive Order no. 766 of 7 July 2004: Notice of mapping of environmental noise and noise action planning.[47]

In 2011, Executive Order no. 1309 of 21 December 2011 on mapping of environmental noise and preparation of noise action was issued. The new order defines the scope of the survey for the second phase of the Noise Directive.[48]

At least two additional pieces of legislation also set out requirements in respect of environmental noise:

- The **Environmental Protection Act** empowers the Environmental Ministry to set quality standards for allowable noise level - guiding as well as binding rules.[49]

- The **Act of Planning**, § 15a, prohibits the planning authorities from laying out noise affected areas for noise-sensitive applications unless the plan provides for the establishment of shielding measures etc., that can secure the future use against noise nuisance.[50]

Both acts provide a statutory basis for a number of guideline documents regulating noise pollution. Building provisions set in-door noise limit values for new houses at 33 dB.[51]

Prior to the Directive, Denmark had already adopted a Road Noise Strategy in 2003, which runs until 2020 and already triggered the development of municipal noise mitigation plans and the adoption of noise-reducing asphalt. The Road Noise Strategy was evaluated and revised in 2010. The evaluation showed that most government initiatives had been implemented or were being implemented. However, the number of affected homes was still high, as 785,000 homes were affected by road noise above the recommended limit value – almost one in every three homes.

One issue raised by the Commission with Denmark is the inconsistent relation between Strategic noise mapping reports and NAPs. Denmark proposes a solution based on a geographical assignment using GIS for linking the municipalities to the NAP.

8.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Denmark included 1 agglomeration, 3 airport(s), and 1,043 km of major roads and 444 km of railway.

The introduction of definitive thresholds in R2 led to 3 *additional* agglomerations, and a total of 894 km of major railway lines and 1,043 km (same as in R1) of major roads being covered.

[47] https://www.retsinformation.dk/Forms/R0710.aspx?id=12753

[48] https://www.retsinformation.dk/Forms/R0710.aspx?id=139549

[49] https://www.retsinformation.dk/Forms/r0710.aspx?id=132218

[50] https://www.retsinformation.dk/Forms/r0710.aspx?id=144425

[51] IV with competent authority

Table 81 END coverage – Denmark

Round	Agglomerations	Major airports	Major railways	Major roads
1	1	3	444 km	1043 km
2	4	3	894 km	1043 km

8.2 Competent Authorities and designated administrative bodies

The **Danish Environmental Protection Agency** (Miljøstyrelsen) under the Ministry on Environment has the **overall responsibility for both the SNMs and the NAPs**. There are in addition a number of other organisations that are involved in END implementation for different transport infrastructure types, as summarised in the following table:

Table 82 Administrative Responsibility for the END – Denmark

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities*	Cross-ministerial Road-Noise Group jointly with the Road Directorate Major roads Ministry of Transport & Road Directorate	Ministry of Transport The responsible traffic association	Environmental Protection Agency (Copenhagen airport) Municipalities – wherever smaller regional airports were included within agglomerations
Approving SNMs	Municipalities			
Preparing NAPs				
Approving NAPs	Environmental Protection Agency			
EC/EEA reporting	Danish Environmental Protection Agency (Miljøstyrelsen) under the Ministry of Environment			

In case of agglomerations, The Environmental Protection Agency reviews the noise action plans with regard to minimum requirements mentioned in annex V of the Directive and sends an acknowledgment of receipt. However, the Agency has no competence to instruct municipalities or any of the other authorities involved.

The Danish Environmental Protection Agency is moreover responsible for coordinating and publishing the SNMs.

Further guidance exists in the form of an extensive handbook[52] with directions on mapping noise and preparing NAPs. This as well as another booklet[53] are mainly intended for municipalities.

[52] http://www2.mst.dk/Udgiv/publikationer/2006/87-7052-146-8/pdf/87-7052-146-8.pdf

[53] http://mst.dk/media/mst/66261/styr_paa_stoejen.pdf

8.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

8.3.1 Data collection

According to the first implementation report, there was enough data and information available for the 2005 designation of sites and no specific problems were encountered when increasing the scope in 2008.

8.3.2 Implementation issues

Issues raised in R1, together with actions taken to address them, and new issues in R2 are shown in the table below.

Table 83 Designation issues – R1

R1	R2
Municipalities expressed concern that focus on a few bypass roads in strategic noise mapping missed the roads with major noise problems in densely populated city centres.	Extended road coverage for strategic noise mapping in R2.
An examination of the municipal roads in Denmark revealed that almost every municipality had one or a few short sections of road with traffic above the Environmental Noise Directive criteria, and that the most of the traffic were neither related to city centres nor to the network of regional roads.	Major roads were mapped as a coherent network of regional or national roads, administered by the Ministry of Transport. The EC and European Environmental Agency were notified of this decision 21 June 2012.
	Some road data used in the initial calculations at national level should have been excluded since roads designated as "major roads" were found to be outside the END threshold of passenger journeys. Some of the designated roads were found to have less traffic than had been expected and should not have been mapped.

8.4 Noise limits and targets

8.4.1 Objectives and Scope

The non-binding guidance limit values were last reviewed in 1994 in the Environmental Protection Agency's guideline 5/1994 on noise from airfields. The limit values are presented in the table below.

Table 84 Noise limit values in Denmark for airports[54]

Type of area	Airports	General airfields
Residential areas and noise-sensitive buildings for public purposes (schools, hospitals, nursing homes, and similar)	55 dB	45 dB[1]
Scattered buildings in open country	60 dB	50 dB
Professions (hotels, offices, and similar)	60 dB	60 dB
Recreational areas with overnight residence (summerhouses, allotment gardens, camping sites, and similar)	50 dB	45 dB
Other recreational areas without overnight residence	55 dB	50 dB

If the county council considers the general airfield as being of regional importance in a regional planning context, the guidance limit value is 50 dB. The maximum noise limit values expressed in terms of L_{max} apply between 10 p.m. and 7 a.m. for built-up and recreational areas, 70 dB for general airfields and 80 dB for airports and airbases. The limit values and L_{max} indicated in the table will continue to be applied in connection with the regulation of noise from airfields and airports and associated planning.

There are no general noise limits for **railway noise** in Denmark. Rather, noise limits exist for the construction of new lines or new construction of dwellings along existing lines. However, it is possible to expand rail capacity along existing without paying attention to noise limits.[55] The noise limits that apply in the former case are[56] (dwellings, areas for staying out of doors): 64 dB[57].

There are also requirements for both the maximum noise level and vibration level of the individual dwellings. The recommended limit for the maximum level is 85 dB, and limit vibrations is 75 dB KB-weighted acceleration level.

The noise limits for **road traffic** noise are[58]:

- Recreational areas in the open country (areas for holiday cottages, camping sites, green areas, etc.): 53 dB
- Recreational areas near or in cities (parks, allotment gardens, city camping, etc.): 58 dB
- Dwelling areas (dwellings, areas for staying out of doors): 58 dB
- Public purposes (hospitals, institutions, schools, universities, etc.): 58 dB
- Commercial purposes (hotels, offices, etc.): 63 dB

[54] http://eng.mst.dk/topics/noise/recommended-noise-limits/noise-zones/airport-and-airfield-noise-zone/

[55] Interview with Danish Rail Network

[56] http://eng.mst.dk/topics/noise/recommended-noise-limits/noise-zones/railway-noise-zone/

[57] According to the railway authority, this is the only limit value used when upgrading or building new railway lines

[58] http://eng.mst.dk/topics/noise/recommended-noise-limits/noise-zones/road-traffic-noise-zone/

Table 85 Limit values for noise from installations - examples[59]

Land-use type	Noise limit values	
	Day dB (A)	Night dB (A)
Industry	40-70 dB (depending on location)	35-70 dB (depending on location)
Wind turbines	3744 dB (depending on location and wind speed)	37-44 dB (depending on location and wind speed)

Methods for establishing noise limit values

Since 2007, L_{den} guidance limit values have been used for traffic noise from road and rail.[60] There are no limit values expressed in terms of L_{night}, but limit values for the maximum value expressed in $L_{max.}$ For the regulation of noise from companies the unit used is L_{Aeq} as the averaging period for noise generated by companies is 8 hours, 1 hour and half an hour respectively during daytime (7 a.m.-6 p.m.), evening (6 p.m.-10 p.m.) and night (10 p.m.-7 a.m.). Health based assessments were used when establishing the noise limit values.

In conjunction with the adoption of the *Order on strategic noise mapping and noise action plans*, Denmark has revised the guidelines on road and rail noise, and from now on noise is expressed in terms of L_{den}. This metric will be used for both strategic noise mapping and planning and in further regulation of these types of noise. With regard to business-generated noise, L_{den} will be applied in planning (optional) and Strategic noise mapping while the regulation of noise from businesses is expected to continue to be based on L_{Aeq} in each of the day, evening and night periods. For planning purposes, it is expected that guidance limit values will be worked out for business-generated noise to be expressed in terms of L_{den}.

Non-binding target values

Irrespective of the Directive, the Danish government in 1993 adopted the goal to reduce the number of residences exposed to severe noise nuisance to 50,000 by 2010. This target has not been achieved.[61] The Danish Road-Noise Group calculated that this target could only be achieved with an investment of DKK 7 billion which is not realistic for the foreseeable future.

The Environmental Protection Agency has set recommended limit values for noise from road traffic in connection with planning and projecting of new residential areas along busy roads. These are laid down under Section 14 of the Environmental Protection Act. New constructions and major rebuilding along roads that lead to a noise level of more than 58 dB L_{den} for individual buildings are to be insulated against the extraneous noise so that the noise level indoors in the dwelling rooms does not exceed 33 dB L_{den}. No limit values have been established in respect of the existing housing stock. No recommended limit values have been established either for the construction of new roads. The Road Directorate has also issued road regulations that recommend that the

[59] http://eng.mst.dk/topics/noise/recommended-noise-limits/noise-zones/

[60] http://mst.dk/virksomhed-myndighed/stoej/stoejgraenser/

[61] http://eng.mst.dk/media/mst/69033/Road%20traffic%20noise%20strategy%20UK%20version.pdf

road boards endeavour to achieve the lowest possible noise levels along new roads, i.e. 58 dB L_{den} in the case of all-year residences and 53 dB L_{den} for holiday homes.[62]

8.4.2 Implementation issues

In relation to noise limit values, one of the main problems highlighted by interviewees is that there is very little enforcement activity if maximum binding noise limit values are exceeded. This was the case in both Rounds.

8.5 Quiet areas

8.5.1 Overview

L_{den} is used to define quiet areas within agglomerations. Another non-acoustic criterion was that the areas had to be publicly accessible. Quiet areas are defined within the municipality NAPs. Before the END, Denmark also sought to preserve certain natural areas for their quietness.

8.5.2 Implementation issues

No issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 86 Quiet area issues

Issue	Action
Only limited standards set for quiet areas in END, according to Copenhagen municipality. Could be more ambitious.	To be decided

8.6 Strategic noise mapping

8.6.1 Overview

An overview of the number of SNMs produced in Rounds 1 and 2 is shown below, showing the effect that introducing the definitive thresholds had on the number of SNMs that were required under the Directive.

Table 87 SNMs - Denmark

	R1	R2
Agglomerations	1	17 (17)
Major airports	3	3 (3)
Major railways	2 (444 km)	4 (4) (894 km)
Major roads	2 (1043 km)	3 (3) (1043 km)

[62] http://eng.mst.dk/media/mst/69033/Road%20traffic%20noise%20strategy%20UK%20version.pdf

8.6.2 Data collection

The Danish Road Directorate is in charge of collecting road traffic data and estimating the noise exposure from state roads, while 17 municipalities are responsible for collecting data for the municipal roads, and the Danish rail collects rail data. The new and more close-meshed mapping used in the Road-Noise Strategy as a basis for the calculation of scenarios does not provide the opportunity to calculate the individual contribution from state, county and municipal roads to the total noise nuisance. This is first and foremost because some of the dwellings exposed to noise nuisance are exposed to road noise from several types of road. Noise does not respect state, county and municipal road demarcations. There is no corresponding mapping for county roads but the Environmental Protection Agency has carried out a rough estimate on the basis of previous mapping exercises and estimates the county contribution to be in the range between 5 and 10 per cent of the total noise exposure. It is therefore estimated that 85% of the dwellings affected by noise are exposed to road noise from municipal roads.[63]

Valid data such as traffic counts, topography etc. have been available for the assessment for most authorities

8.6.3 Strategic noise mapping methods

Different procedures to obtain data were employed by different public authorities. Many public authorities used central registers of buildings and inhabitants to link inhabitants to buildings, while the SNMs used average inhabitant densities to make this calculation. Prior to the END, Danish Strategic noise mapping only calculated noise exposure as LAeq, 24h i.e. as 24-hour equivalent values.[64] In connection with implementing the Directive, national guidelines were adopted and L_{den} and L_{night} were used for the preparation of the SNMs. The guidelines do not prescribe the GIS formats to be used. This implies that the different map formats needed to be translated into one standard to make them compatible which caused some delays. For the next round, only the shp file format will be specified. The guidelines are regarded as clear and very useful by the Copenhagen municipality.

The guidelines no. 4/2006 specify that Nord2000 has to be used as a noise calculation method for mapping of road and rail noise.[65] Initially developed from 1996-2001, the method includes source models for road and rail traffic in third octave bands from 25 Hz to 10 kHz. The propagation model can be applied for a variety of weather conditions, allowing a precise yearly average to be determined. Complicated terrain is handled by a concise procedure, so the interpretation of terrain shapes by skilled personnel that earlier was necessary is now abandoned, and the method can be applied to automated Strategic noise mapping without loss of accuracy. The team responsible for Nord2000 took part in the European Harmonoise project, where the Nord2000 model formed a basis for the development of the Harmonoise Engineering model. Several of the findings from this project have been subsequently introduced in an update of Nord2000 and the data from both projects are assumed to be comparable.

It has not been decided yet whether to use the same methodology in Rounds 3 and 4. Guidance will be updated accordingly.

[63] http://eng.mst.dk/media/mst/69033/Road%20traffic%20noise%20strategy%20UK%20version.pdf

[64] http://eng.mst.dk/media/mst/69033/Road%20traffic%20noise%20strategy%20UK%20version.pdf

[65] http://eng.mst.dk/topics/noise/noise-mapping-and-action-plans/

8.6.4 Public accessibility of SNMs

With regard to public accessibility to SNMs and graphical presentations of SNMs, SNMs have been published online and are available in Danish from the following website: http://noise.mst.dk/. According to the Environmental Protection Agency, in R1, public demand was high and positive feedback has been received from individuals and, for example, from architects using the SNMs in planning for quiet neighbourhoods. Promotional material from the EPA was also sent to municipalities.

8.6.5 Implementation issues

A number of issues were raised as a result of R1, and a number of further issues were raised during R2, as summarised in the following table.

Table 88 Strategic noise mapping issues

R1	R2
The long period of time required for data computations and calculations Technical problems with various GIS-formats being used by different public authorities Technical challenges in publishing SNMs online in a readily accessible format. Nord2000 was a technical challenge in R1 for the Copenhagen municipality.	No actions taken.
	In R2, the technical challenges with regards to Nord2000 have been small.

In terms of steps taken to address these implementation challenges, the Environmental Protection Agency in 2011 published a revised statutory order no. 1309 on Mapping of Environmental Noise and Preparation for NAPs which makes ESRI Shape (SHP) or MapInfo Interchange Format (MIF) mandatory for GIS formats.[66]

[66] https://www.retsinformation.dk/Forms/R0710.aspx?id=139549, according to competent authority

8.7 Noise action planning

8.7.1 Overview

An overview of NAPs in Denmark is shown in the following table.

Table 89 NAPs – Denmark

	R1	R2
Agglomerations	17	14 (17)
Major airports	3	3 (3)
Major railways	2	4 (4)
Major roads	2	3 (3)

Source: Danish CA

In addition to NAPs, the Danish Planning Act is a very important resource for municipal and other planners.[67]

8.7.2 Methodologies for noise action planning

Guidelines have been adopted at the national level and the SNMs were used as a basis in developing the NAPs. The specifications for NAPs include a summary of the SNMs. The municipalities and other traffic authorities are free to choose any criteria in order to prioritise actions. The Ministry of Environment recommends for municipal planning, environmental and road sections, and potentially health sections, to cooperate in this regard. The plans thus devised should be used in conjunction with the traffic and environment plans to feed into the spatial plan for the respective municipalities. The municipal NAPs should be presented at a public hearing and be discussed in the municipal councils.[68] The exceedance of Danish noise limit values was used as a basis for establishing priorities for the NAPs. Priorities have been set at both the national and the local level. Denmark considers five years to be an appropriate time period for the revision of the NAPs. The Environmental Protection Agency indicated that evaluation of NAPs could be streamlined with the evaluation of pre-existing noise measures.

8.7.3 Measures

No specific measures were identified in the 2011 implementation report. However, the research found that examples of the types of measures identified in Denmark and implemented in Rounds 1: Five noise partnership demonstration projects financed by the Ministry of the Environment. For these projects in the municipalities of Allerød, Aarhus, Copenhagen and Frederiksberg (two projects), 4 million DKK were set aside. Along with resident financing, DKK 13 million were used to finance noise protection from 2005 to 2007, benefitting at least 500 residents in 250 homes.[69] With regards to noise stemming from construction activities, the Danish Building Act provides that new housing is not built with noise nuisances exceeding 55 dB. New residential areas cannot be laid out where noise from road traffic exceeds 55 dB.

[67] Interview with Danish Road Directorate

[68] http://eng.mst.dk/topics/noise/noise-mapping-and-action-plans/

[69] Report available in Danish: http://eng.mst.dk/media/mst/66256/stoej_magasin_feb08.pdf

State efforts to reduce **road noise** have focused on three areas:

- Noise reduction along existing roads
- Noise reduction in connection with new constructions/widening of roads
- Research, development and communication.

Prior to the END, from 1992-2001, the Danish Road Directorate spent DKK 212 billion on noise-abating measures along state roads.[70] New road construction projects already allocate significant amounts to noise reduction. For example, 10% out of the overall budget for the extension of a motorway around Copenhagen (DKK 190 million) had been allocated to such measures.

Below is a list of state initiatives part of the road traffic noise strategy 2010-2014:[71]

Table 90 – List of noise mitigating initiatives

No.	Initiative
1	Noise protection at existing state roads. New initiative. In the green transportation agreement from 2009, DKK 400 million have been earmarked for noise protection at existing state roads and tracks, towards 2014. [Danish Ministry of Transport]
2	Action in the EU for increased vehicle and tire requirements. Continued initiative. There is a large potential gain by switching to low noise tires [Danish Transport Authority]
3	Information concerning the choice of low noise tires. Continued initiative. Can be implemented when labelling of tires enters into force. [Danish Transport Authority]
4	High noise protection at new state road constructions. Continued initiative. Has been the practice for many years [Danish Road Directorate]
5	Noise reducing asphalt on state roads. Continued initiative. Low noise asphalt (thin-layer coating) are increasingly becoming standard on state roads since 2003 [Danish Road Directorate]
6	Low noise asphalt – research and dissemination. Continued initiative. The development of low noise asphalt and dissemination of knowledge will continue [Danish Road Directorate]
7	Noise considerations regarding public procurement of cars and driving services. New initiative. [Danish Environmental Protection Agency]
8	Reduced speed. Guide with good examples. Adjusted effort. In some cases, there are poor communication between municipality and police in the reduction of speed for the sake of noise. A guide to improve the framework for dialogue [Danish Environmental Protection Agency, Danish Ministry of Justice]
9	Noise barriers, research and dissemination of visual identity and power. Noise barriers have been used for years. Efforts must be maintained and further developed. [Danish Road Directorate]
10	Noise in public housing. New initiative. In collaboration with the National Building Fund, a campaign has been launched on how their funds can be used for noise abatement in public housing, as part of renovation projects. [Danish Environmental Protection Agency, the National Building Fund, Danish Ministry of Social Affairs]
11	Communication with municipalities on effective means, quiet areas. Continued initiative. The evaluation shows that municipalities have a good knowledge of effective means to reduce noise. This continued initiative maintains that. [Danish Road Directorate, Danish Environmental Protection Agency]

[70] http://eng.mst.dk/media/mst/69033/Road%20traffic%20noise%20strategy%20UK%20version.pdf

[71] http://eng.mst.dk/media/mst/69034/State%20initiatives%20in%20road%20traffic%20noise%20strategy%202010-14.pdf

No.	Initiative
12	NAPs, case studies and possible networking. New initiative. NAPs form the basis for a noise action. Good examples of NAPs will be disseminated and networking among municipalities will be promoted. [Danish Environmental Protection Agency]
13	SNM of Denmark. New initiative. The Danish SNM on mst.dk will be continuously updated and cover more noise affected residences as the Strategic noise mapping of the four largest cities are completed in 2012. [Danish Environmental Protection Agency]

With regard to **noise from railways**, Rail Net Denmark along with the Danish Environmental Protection Agency has initiated noise protection projects[72], including installing 47 km of acoustic screening and soundproofing 4,000 homes since 1986. Until the project came to an end in 2014, DKK 600 million had been spent. Out of that amount, roughly DKK 20 million were spent on tackling noise at source.[73] The project focused on dwellings that are exposed to a noise level of above 64 db. The Environmental Protection Agency mandates that in case of any new rail construction projects that would result in dwelling being exposed to noise levels above 64 dB, Rail Net Denmark needs to cover 100% of the costs of either soundproofing those houses or installing noise screens.[74] The project successfully came to an end once all dwellings above L_{den} 64 dB either were protected by a noise screen or received or were insulated.

8.7.4 Public consultations

In R1, all NAPs were published and in a number of cases, responses were solicited from the public as part of a public consultation process. The beginning of this process started with a public hearing. In guidance prepared by the Environment Protection Agency on strategic noise mapping and noise action planning, municipalities and implementing authorities were encouraged to involve the public in the process.

According to the Danish Road Directorate, public consultations are hard to carry out at national level in practice snice the Road Directorate potentially needs to consult with stakeholders located across major roads in the whole country. It was seen as easier for municipalities to engage with local stakeholders during consultations. The Danish Railway Authority only received a few comments on their NAP which were incorporated in the publication.

8.7.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 91 Noise action planning issues

R1	R2
Delays in strategic noise mapping led to delays in Noise action planning. Problem: The Environmental Protection Agency lacks the legal means to force municipalities to devise NAPs.	No action foreseen.

[72] http://eng.mst.dk/media/mst/69031/COWI%20Feature%20noise%20control%20along%20main%20railways.pdf

[73] Interview with the Danish Rail Network

[74] Interview with the Danish Rail Net

R1	R2
Administrative changes due to a municipal reform which was carried out on 1st January 2007. This led to a substantial decrease in the number of municipalities, but meant additional work for those remaining.	
	The Environmental Protection Agency stated that they had written to different municipalities several times to stress the importance of finalising the NAPs. Three small ones did not submit on time which meant that the entire END implementation deadline was not met. The three action plans are expected to be approved by the municipal councils in spring 2016 Subsequently the Environmental Protection Agency will send the final summary for Round 2 to the EU Commission.

9. ESTONIA

9.1 National implementing legislation for END

9.1.1 Legal implementation

The END has been transposed by sections 130-136, 142 and 151 of the *Ambient Air Protection Act* (Välisõhu kaitse seadus (RT I 2004, 43, 298)) and by *Regulation No. 87* of the Minister of Social Affairs of 29 June 2005 "The minimum requirements of SNM and NAP designed to reduce noise" (Sotsiaalministri 29. juuni 2005. a määrus nr 87 "Välisõhu strateegilise mürakaardi ja välisõhus leviva müra vähendamise tegevuskava sisule esitatavad miinimumnõuded" (RTL, 14.07.2005, 78, 1092).[75]

9.1.2 Scope of END implementation – Rounds 1 & 2

R1 of Strategic noise mapping and Noise action planning in Estonia covered 1 agglomeration, no airports, and approximately 11 km of major roads and no railway. The reintroduction of definitive thresholds in R2 led to 1 *additional* agglomeration, and approximately 27 km of major railway lines and 158 km[76] of major roads being covered in total.

Table 92 END coverage - Estonia

Round	Agglomerations	Major airports	Major rail	Major roads
1	1	0	0 km	11 km
2	2	0	27 km	158 km

9.2 Competent Authorities and designated administrative bodies

Table 93 Administrative Responsibility for the END - Estonia

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Tallinn and Tartu City Government	Estonian Road Administration	Estonian railway	n/a
Approving SNMs	The Health Board, but we will change the system and then the administrative bodies will approve themselves and the bodies, who will make the SNMs and will be the consultants for the NAPs, must be accredited as noise measurement bodies			
Preparing NAPs	Tallinn and Tartu City Government	Estonian Road Administration	Estonian railway	
Approving NAPs	The Health Board, but we will change the system and then the administrative bodies will approve themselves and the bodies, who will make the SNMs and will be the consultants for the NAPs, must be accredited as noise measurement bodies			
EC/EEA reporting	Ministry of Environment			

[75] Information on noise mapping legislation can be found at https://www.riigiteataja.ee/ert/act.jsp?id=13202035, and https://www.riigiteataja.ee/ert/act.jsp?id=917329.

[76] Initially 245 km envisaged. Only sections exceeding 3 million vehicles per year included.

These arrangements did not change between R1 and R2. While in theory the flight administration would be in charge of strategic noise mapping for **airports**, in practice no such mapping was carried out due to the minor importance of air traffic in Estonia.[77] At Tallinn airport, a permanent noise monitoring system is in place, however. Regarding **railways**, the responsible authority will only become active once they reach over 30 000 trains per year, and would then submit these numbers to the City Environmental Department. Currently, they are not active.

According to the CA, it is not sufficiently clearly defined by the Directive whether the CA should only play supervisory role or be actively engaged in SNMs and NAPs as well as abatement measures.

9.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

The Good Practice Guide was used in some instances.

Stakeholders in Estonia disagreed as to whether a threshold of 3 million movements should be used or not in Round 2. Under the Road NAP 2009-2013, only roads with more than 6 million vehicles were included.

9.4 Noise limits and targets

9.4.1 Objectives and Scope

Based on the Ambient Air Protection Act and the Public Health Act, the main act to provide binding noise limits in Estonia is Regulation No 42 of the Minister of Social Affairs from 4 March 2002 "Standard noise levels for residential and recreational areas, dwellings and buildings with joint use, and the methods of measuring noise". Regulation No 42 applies to the following sources of noise, vehicle-, flight-, and air transport); industrial enterprises; commercial- and services' enterprises, sports fields and entertainment venues; and construction works.

Table 94 Limit values for noise from traffic - Estonia

	Day dB (A)	Night dB (A)
Recreational	55	50
Residential	60	55
Mixed	65	55
Industrial	75	65

[77] According to the competent authority

Table 95 Limit values for noise from industry Estonia

	Day dB (A)	Night dB (A)
Recreational	55	40
Residential	60	45
Mixed	65	50
Industrial	60	45

More specific noise limits are also provided in:

- Government of the Republic Regulation No 108 from 12 April 2007 "Requirements of occupational health and –safety for the noise-influenced occupational environment, noise limit levels of occupational environment and conditions of measuring noise"
- Regulation No 122 of the Minister of Environment from 22 September 2004 "The limit values of emissions, pollutant emissions, smokiness and noise-levels in fumes of a motor vehicle"
- Regulation No 87 of the Minister of Economic Affairs and Communication from 4 August 2005 "Requirements for noise, measuring of noise and marking of noise caused by the devices used in outdoor environment".

The Health Protection Inspectorate exercises supervision over ambient air noise levels and has the right to:

- Demand information and documents from persons generating noise and use the results of measurements or technical devices for recording noise levels
- Issue an order to restrict or terminate the operation of a stationary source of pollution if the noise levels exceed the limit or critical ambient noise levels (failure to comply can result in a penalty with the upper limit of € 639)
- Conduct tests to verify noise levels.

The Health Protection Inspectorate also has the right to impose sanctions in case of violation of limit levels either on the grounds of violating the Ambient Air Protection Act or the Public Health Act. If the sanctions are applied under the Public Health Act the fine for legal persons is € 3,196. If the sanctions are applied under the Ambient Air Protection Act the fine is € 1,917.

In order to prevent the exceedance of the standard levels of ambient noise, local authorities have the right to restrict the movement of motor vehicles within their territory (Section 138 of the Ambient Air Protection Act).

9.4.2 Implementation issues

Some issues with regard to the scope of roads included – threshold of 6 million vehicles per year not directly applicable to Estonian categorisation.

9.5 Quiet areas

9.5.1 Overview

24 quiet areas were established during R1 as part of the NAP for Tallinn. In R2, an additional 20 areas were established for Tartu.

Delimitation

The criteria L_{night} and L_{den} were used for the delimitation of quiet areas. Another non-acoustic criterion was recreational area larger than 3 hectares. There is no common methodology for defining quiet areas in Estonia.

Agglomerations

The only quiet areas designated in Estonia lie within the agglomerations of Tallinn and Tartu and were devised in the NAPs of these cities.

Open country

During the preparation of the current NAP, the Estonian Road Administration did not identify any quiet areas along main roads or received any requests from local authorities to take any quiet areas into consideration.

9.5.2 Implementation issues

Quiet areas are not clearly defined in Estonian legislation. Nevertheless, no issues were raised as a result of END implementation.

9.6 Strategic noise mapping

9.6.1 Overview

Several guidance notes were used for Strategic noise mapping in Estonia: "2007 Good Practice Guide for Strategic noise mapping", "Reporting Strategic noise mapping information to the public", "State of the art report on Strategic noise mapping", and "Environmental Noise Data Reporting Mechanism Handbook".

An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 96 SNMs - Estonia

	R1	R2
Agglomerations	1	2 (2)
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	1	1 (1) (158 km)

No separate SNMs were produced for railways or airports because they are linked to the agglomeration SNMs.[78] The airport of Tallinn has its own continuous noise monitoring system.[79]

9.6.2 Data collection

GIS overlays were used for gathering data. Both L_{night} and L_{den} were used for Strategic noise mapping, as well as L_{de}, L_{Aeq}, L_{pAeqT}, L_{pAmax}. Five years is considered to be an appropriate time interval between revisions of SNMs by the Estonian authorities.

The Health Protection Inspectorate as the CA and the Ministry of environment, and locally, the Tallinn City Government. From 2016 onwards, municipalities are obliged to produce local SNMs.[80] The environmental investigation foundation at the Ministry of Finance funded strategic noise mapping based on revenue from environmental taxes.[81]

The completed SNMs of the City of Tallinn, the SNM of road-cuts, which vehicle passages exceed six million a year, and the SNM of the Old City Harbour in Tallinn are made available online.[82]

9.6.3 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 97 Strategic noise mapping issues - Estonia

R1	R2
Several problems with collecting data for strategic noise mapping. There were particular problems with the data regarding the numbers of inhabitants in dwellings, and sound power levels of industrial sources.	It is important to update the digital topographic maps, which are the base for noise modelling, with new buildings and specify existing information for building parameters. This will be addressed in round 3.
The authorities reported problems arising from the range of different noise computational methods and a lack of Strategic noise mapping software. There were problems in the assignment of noise exposure levels to population.	There is a lack of information about the building use which has to be collected and the number of residents in buildings. This will be addressed in round 3.
The CA stated that it was unclear what kind of ports should be included in the strategic noise mapping.	Necessary to separate data for vehicles and specify the data about traffic load in streets. Separate data for car and truck traffic and their variability in day and night time should be added. This will be addressed in round 3.
The Health Inspectorate rejected the SNM for Tallinn, although it was submitted to the Commission nevertheless.	Not an issue in Round 2.

[78] According to the competent authority

[79] According to the competent authority

[80] According to the competent authority

[81] According to the competent authority

[82] http://www.tervisekaitse.ee/?page=237 and http://www.tervisekaitse.ee/?mid=175 (for the roads)

9.7 Noise action planning

9.7.1 Overview

An overview of NAPs is shown in the following table.

Table 98 NAPs - Estonia

	R1	R2
Agglomerations	1	2 (2)
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	1	1 (1)

Source: CA

No separate NAPs were produced for railways or airports because they are linked to the agglomeration NAPs.[83]

9.7.2 Methodologies for noise action planning

National guidelines for drawing up NAPs are available online in Estonian.[84] The 2006 maps were used as a basis for developing the two NAPs in 2008. Other criteria included public demand and acoustic insulation. Both of the NAPs were prepared in order to fulfil the requirements of article 8(1) of END.

According to the Road Administration's NAP 2014-2018, there are 177 dwellings where the night time noise limit values are exceeded and measures required (based on SNM 2012). For reasons of cost-effectiveness, the dwellings housing a larger number of residents are prioritised. With the noise reduction measures over the period of 2014-2018 approximately 527 people will be experiencing noise reduction.

The NAP on Roads includes an evaluation of how the construction of noise barriers will reduce noise. The implementation of Noise Action Plans will be evaluated by the number of dwellings that will no longer be in the area of where the noise limit value is exceeded. Evaluation of the implementation will be carried out on 2018, when the Action Plan will be revised.

9.7.3 Measures

The City of Tallinn NAP specifies measures including traffic planning, land-use planning, technical measures at the source, insulation, selection of quieter sources, reduction of sound transmission, and regulation. In most cases the measures are not accompanied by cost estimates or implementation deadlines. Sources of financing are not specified in the NAPs. While there is no binding obligation to integrate the measures of an NAP in land use plans, the NAP of Tallinn has also a special section of measures, referred as "Considering environmental noise in new land-use plans". This provides a list of measures that could be especially relevant to different land-use plans, e.g. on new land use plans not posing a danger to quiet areas. In 2013, Tallinn

[83] According to the competent authority

[84] http://www.riigiteataja.ee/ert/act.jsp?id=13164685 and http://www.riigiteataja.ee/ert/act.jsp?id=917329

also introduced free public transport to its citizens, a measure which could potentially reduce noise.

Because the implementation of the NAP overlapped with the economic recession, mainly previously used administrative measurements like the preparation and establishment of part plans were carried out. Technical measurements (like noise barriers) have not been implemented. The following table summarises noise management actions resulting from the City of Tallinn NAP and their cost, where available:

Table 99 Tallinn City NAP cost of measures

Action	Cost, EUR
Establish plan of green areas	0
Establish plan „Streets and light traffic roads"	0
Noise-related actions: 1) requirements to part plans; 2) check defensive measures when certificate of occupancy is accepted	0
Considering with silent areas and their protection in detail planning	0
Whit new part plans prefer public transport and bicycle transport	0
Keep existing greenery, add new greenery	0
Reconstruct park Kalamaja	500 000
Encourage use of public transport: month of environmentally friendly movement, car free day	30 000
Rails together brazing	134 000
Changing the school windows	-
Buying new trains	-
Set up public transport lanes	-
Set up bicycle paths	-
Vehicle movement restriction, traffic redirect, heavy goods vehicle traffic forbidding	-
Mark down speed limits	0
Solving noise complaints	0

The Road Administration's NAP recommends the construction of certain types of noise barriers as a key measure. The NAP 2009-2013 identified six places where noise barriers should be erected. However, only one out of six noise barriers was in fact built during the period of 2009-2013 due to a lack of national budget available. At the same time, more than 16 km of new noise barriers were built in the context of other road construction and renovation projects. Some noise reduction may have also been achieved by reducing speed limits.

9.7.4 Public consultations

Section 12 of Regulation No 87 specifies that:

- Approved SNMs and NAPs shall be made available to the public and disseminated on the internet, ensuring free access to environmental information;
- The compilers of the NAPs must: notify the public and provide them with the possibility to participate in the preparation and overview of all phases of the NAP; ensure that the opinion of public is taken into account; and ensure that the public is informed of the decisions made. The deadlines of the NAP process must enable the public to participate in all the phases of the NAP.

The NAP of Roads was on public display from 1-15 October 2008 in the offices of two local governments, in the office and on the website of Road Administration. On 15 October 2008, public consultations were supposed to be held in two locations. One of them was cancelled due to the lack of participants and the other one went ahead with only limited participation. No written comments were submitted with regard to the NAP of Roads.

The NAP of Tallinn was on public display from 3-16 February 2009, after having been announced in one nationally distributed newspaper and on the website of the City of Tallinn. From 16-18 February 2008, three public consultations were held. Participation was quite limited, two of the consultations were attended by four citizens and the other was attended by only one citizen. Several letters with proposals were also submitted during the public display of the NAP. The NAP of Tallinn includes the minutes of the public consultations as well as a table listing the proposals made and the answers provided. Out of approximately twenty proposals, only one led to an amendment of the NAP[85].

For the Road Administration's NAP 2014-2018, public consultation was organised through their website as well as letters sent out to all local authorities whose territory was covered by SNMs. According to the Road Administration, the low participation rate in consultations with the public represents a major problem.

9.7.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 100 Noise action planning issues - Estonia

R1	R2
There was a delay in strategic noise mapping and developing NAPs of roughly one year (two companies were involved; amount of work was underestimated).[86]	No longer an issue.

In both rounds, there was very low participation in public consultation events so it was suggested to simply make documents publicly available in the future rather than organising hearings, which were poorly attended. However, this would not meet the spirit of the Directive, of involving the public in consultation processes so as to improve the quality of NAPs.

[85] Ibid

[86] According to competent authority

10. FINLAND

10.1 National implementing legislation for END

10.1.1 Legal implementation and relevant legislation

The transposition of the Environmental Noise Directive (2002/49/EC) is based on amendment of a law (459/2004) to the Environmental Protection Act (86/2000, 527/2014). The detailed legal provisions on the assessment and management of environmental noise (e.g. indicators, contents of strategic mapping and NAPs, timetables for different tasks) were transposed into Finnish law by Government Decree (801/2004) issued under the Environmental Protection Act (EPA).[87]

Besides, there are several pieces of separate legislation which affect END implementation in Finland.

The noise abatement NAPs produced for airports and industry under the END may overlap with the environmental permit system already established in Finland in accordance with the EPA. Under the Act, a notification must be submitted on any activity or event that causes noise or vibration if there is reason to suppose that the noise or vibration will be particularly disruptive.[88]

Public road planning, design, construction and maintenance are regulated by the Road Act (503/2005). The Act requires any development and maintenance of the public road network to promote the implementation of the national land use guidelines, and also to adhere to national goals set for the urban structure and the environment in land use planning. Attention also has to be paid to ensure that damage caused by the road network to the environment is minimised.

In 2006, the Finnish Government adopted a resolution on noise abatement.[89,90] This resolution, which applies exclusively to environmental noise, sets out the general objectives of and targets on noise abatement, and measures for reducing noise emissions and their harmful impacts. The resolution also emphasises closer cooperation between different authorities. The resolution is relevant for the implementation of the END as it sets the overall goal for noise reduction. The very aim of the resolution is a reduction in noise emissions and the prevention of the spread of noise, resulting in fewer people being exposed to noise than is the case now. It specifically sets out that by 2020 the number of people living in areas where average daytime noise emissions exceed 55 dB (L_{Aeq} 7-22) should be at least 20% lower than in 2003.[91]

10.1.2 Scope of END implementation – R1 & 2

R1 of strategic noise mapping and noise action planning included 1 agglomeration, 2 airports, 96 km of railways and approximately 750 km of major roads.

[87] Milieu, TNO and RPA (2010) Final Report on Task 1 Review of the Implementation of Directive 2002/49/EC on Environmental Noise

[88] Ibid.

[89] Government resolution on noise abatement. Reports of the Ministry of the Environment 7en | 2007.

[90] Finnish Ministry of the Environment, Helsinki via Milieu, TNO and RPA (2010) Final Report on Task 1 Review of the Implementation of Directive 2002/49/EC on Environmental Noise

[91] Milieu, TNO and RPA (2010) Final Report on Task 1 Review of the Implementation of Directive 2002/49/EC on Environmental Noise

The introduction of definitive thresholds in R2 led to the inclusion of an additional 6 agglomerations, and approximately a total of 2,100 km of major roads. The total length of railways included in R2 is still to be confirmed.

Table 101 END coverage – Finland

Round	Agglomerations	Major airports	Major railways	Major roads
1	1[92]	2[93]	96 km	645 km
2	7[94]	3[95]	2,330 km	2,243 km

10.2 Competent Authorities and designated administrative bodies

The Centres for Economic Development, Transport and the Environment (ELY Centres) coordinate the implementation of the END, providing support and advice to the cities and agencies involved. The ELY Centres operate on behalf of the Ministry of the Environment, legally responsible for the collection of data related to SNMs and NAPs. The authorities responsible for preparing and approving the SNMs as well as the NAPs are the Cities of Helsinki, Espoo/ Kauniainen, Lahti, Oulu, Tampere, Turku, and Vantaa, the Finnish Transport Agency and Trafi (the Finnish Transport Safety Agency).

Table 102 Administrative Responsibility for the END - Finland

<table>
<tr><th>Role/Activity</th><th>Agglomerations</th><th>Roads</th><th>Railways</th><th>Airports</th></tr>
<tr><td>Data collection</td><td>The Centres for Economic Development, Transport and the Environment (ELY Centres)</td><td>The Centres for Economic Development, Transport and the Environment (ELY Centres)</td><td>The Centres for Economic Development, Transport and the Environment (ELY Centres)</td><td>The Centres for Economic Development, Transport and the Environment (ELY Centres)</td></tr>
<tr><td>Preparing SNMs</td><td>Municipalities</td><td colspan="3">Finnish Transport Agency</td></tr>
<tr><td>Approving SNMs</td><td rowspan="3">Finnish Transport Agency</td><td rowspan="3">Finnish Transport Agency</td><td rowspan="3">Finnish Transport Agency</td><td rowspan="3">Trafi (Finnish Transport Safety Agency)</td></tr>
<tr><td>Preparing NAPs</td></tr>
<tr><td>Approving NAPs</td></tr>
<tr><td>EC/EEA reporting</td><td colspan="4">Uusimaa ELY Centre (Ministry of the Environment)</td></tr>
</table>

[92] Helsinki

[93] Helsinki-Vantaa, Helsinki-Malmö

[94] Helsinki, Tampere, Oulu, Espoo- Kauniainen, Lahti, Turku, Vantaa

[95] Helsinki-Vantaa, Helsinki-Malmö, Turku Airport

10.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

10.3.1 Data collection

The Uusimaa ELY Centre has overall responsibility for collecting and reporting data to the EEA through the Reportnet system within EIONET. Individual municipalities are responsible for collecting data in respect of agglomerations, while the Finnish Transport Agency and the Finavia are responsible for road and railways, and for airports respectively. The data has been delivered and is readily available for both Rounds.

10.3.2 Implementation issues

A number of issues were raised with regard to designation, a summary of which is shown below.

R1	R2
According to the implementation report for R1, road traffic data collection was challenged by the lower limit for traffic flow, which sometimes resulted in strange results. Nevertheless, Finland decided to stick to the lower limit for traffic flow for reasons of comparability of results for different areas.	No specific implementation issues have been reported for R2.
For aircraft noise, problems were encountered with regard to i) small airports inside agglomerations, ii) major airports near the boundary of an agglomeration, iii) civil and military airports.	

10.4 Noise limits and targets

10.4.1 Objectives and Scope

Finland does not legally enforce noise limit values. Instead there is a Government Decision on General Guideline Values for Noise Levels (993/1992) which was enacted under the Noise Abatement Act (382/1987).

By 2020 the Government's Guideline Values for Noise Levels (GVNL) must be met in present residential areas, in the vicinity of educational and care institutions, and in play-grounds. Daytime noise levels must not exceed 55 dB (L_{Aeq} 7-22). At night-time the value is 50 dB (L_{Aeq} 22-7). If this is not possible in all existing residential areas, noise abatement measures will be taken to restrict maximum daytime and night-time noise levels to 60 dB and 55 dB respectively. It is envisaged that noise abatement actions will initially be targeted at residential areas where the average daily noise levels exceed 65 dB.[96]

The Government Decision on GVNL concerns daytime and night-time. It is applied in the planning of land use, traffic and transport, and construction work and in permit procedures for construction work. They are also applied in environmental permit procedures. The GVNL are divided into outdoor and indoor noise values.

[96] Milieu, TNO and RPA (2010) Final Report on Task 1 Review of the Implementation of Directive 2002/49/EC on Environmental Noise

The table below outline non-binding target values for noise in Finland.

Table 103 - END Guideline noise values in Finland under Decision (993/1992)

Noise source	Noise limit values		Categories to which recommended noise values are applied
	L_{den}	L_{night}	
Road-traffic	58	51	Residential areas, recreational areas in built areas and areas in their proximity, and areas serving nursing or educational institutions
	58	46	New residential areas and areas serving nursing institutions
	48	41	Holiday settlements, camping sites, nature conservation areas
Rail-traffic	63	52	Residential areas, recreational areas in built areas and areas in their proximity, and areas serving nursing or educational institutions
	63	47	New residential areas and areas serving nursing institutions
	53	42	Holiday settlements, camping sites, nature conservation areas
Aircraft around airports	55	50	Residential areas, recreational areas in built areas and areas in their proximity, and areas serving nursing or educational institutions
	45	40	Holiday settlements, camping sites, nature conservation areas
Industrial activity sites	58	51	Residential areas, recreational areas in built areas and areas in their proximity, and areas serving nursing or educational institutions
	58	46	New residential areas and areas serving nursing institutions
	48	41	Holiday settlements, camping sites, nature conservation areas

The following legislation includes provisions on noise emissions:

- Road Traffic Act (267/1981), the Vehicles Act (1090/2002)
- Decree of the Ministry of Transport and Communications on the Construction and Equipment of Motor Vehicles and Trailers (1248/2002)
- Decree of the Ministry of Transport and Communications on the Construction and Equipment of Tractors, Power-driven Work Machines and Off-road Vehicles, their Trailers and Equipment (1251/2002)
- Decree of the Ministry of Transport and Communications on the Construction and Equipment of Two- and Three-wheeled Motor Vehicles and Four Wheelers gives (1250/2002)
- Decree on Noise Emission Levels for Equipment for Outdoor Use (621/2001)
- Act on the Safety and Emission Requirements of Recreational Craft (621/2005)
- Decree on the Safety and Noise Emissions of Recreational Craft and Personal Watercraft and Noise and Exhaust Emissions for Recreational Craft and Personal Watercraft Engines (748/2005)

10.4.2 Implementation issues

None reported.

10.5 Quiet areas

10.5.1 Overview

Finland has no designated quiet areas under the END. However quiet areas are likely to be included for Round 3.

10.5.2 Implementation issues

No issues were highlighted in either Round.

10.6 Strategic noise mapping

10.6.1 Overview

The table below shows the SNMs produced in Finland for Rounds 1 and 2.

Table 104 SNMs – Finland

	R1	R2
Agglomerations	1	7 (7)
Major airports	2	3 (3)
Major railways	1	8 (8) (2,330 km)
Major roads	1	8 (8) (2,243 km)

Source: the ELY Centres

For R1, Helsinki was the only agglomeration producing SNMs. For R2, the following cities have produced SNMs: The City of Helsinki, City of Tampere, City of Oulu, City of Espoo/ Kauniainen, City of Lahti, City of Turku, and the City of Vantaa. The airports Helsinki-Vantaa, Helsinki-Malmö produced SNMs for Rounds 1 and 2, and Turku Airport has produced SNMs for R2.

10.6.2 Data collection

For R1 data collection the Finnish authorities used various methods, including GIS for linking inhabitants to buildings. Movement, performance, and radar data were used for aircraft noise. There were no major challenges reported although some minor issues occurred with regards to noise barriers and numbers of people. The authorities used multiple guidelines, including the '2007 Good Practice Guide for Strategic noise mapping'; 'Presenting Strategic noise mapping information to the public'; 'Environmental Noise Data Reporting Mechanism Handbook'; and the 'Report Network Delivery Guide'.[97] The same methods continued to be used for R2.

Finland – including its cities/municipalities – has a long tradition of collecting noise data. The Uusimaa ELY Centre is the national coordinating body in Finland. The Centre is responsible for a range of regional implementation and development tasks on behalf of the central government, and END implementation is one of these tasks. The Centre provides guidance and Q&A sessions for the cities and authorities that are in charge of the actual data collection on the ground.

For R1 a SNM was prepared for the agglomeration of Helsinki, which included data on the noise caused by Helsinki-Vantaa and Helsinki-Malmö airports as well as data on the noise of highways and railways within the city area. The Finnish Road and Rail Administrations (today merged into the Finnish Transport Agency) conducted their own SNMs simultaneously with the city of Helsinki.

[97] Milieu, TNO and RPA (2010) Final Report on Task 1 Review of the Implementation of Directive 2002/49/EC on Environmental Noise

For R2, an additional six agglomerations were covered (Tampere, Oulu, Espoo/Kauniainen, Lahti, Turku and Vantaa. Finavia also covered Turku Airport.

No issues were reported on **data availability** (Rounds 1 and 2). Data collection had previously been carried out, independently of the END, by the stakeholders involved.

There is national guidance for strategic noise mapping. For both Rounds 1 and 2, L_{night} and L_{den} were used. Also the indicators L_{Aeq}(1.5m,07-22h) and L_{Aeq}(1.5m,22-07h) have been used. Exposure to noise in Finland is assessed by calculating SNMs and the population of residential buildings within specific noise zones. For both Rounds, calculations were made using the Nordic calculation models for road and rail traffic noise as well as the calculation model for air traffic noise. Road traffic noise was calculated for major highways, and the main and collector streets within the city area. Rail traffic noise was calculated for main railway lines, the metro light rail lines and tram traffic.

10.6.3 Public accessibility of SNMs

Summary information on the SNMs for the seven cities and three airports are available online via the respective municipality/authority. For R2, there have been very few enquiries from the public (approx. 10-20) and very limited participation in consultations. There is a general lack of interest from the public. In particular, Finland is a sparsely populated country and noise pollution is confined to a select few areas.

10.6.4 Implementation issues

According to the R1 Implementation Report, a number of implementation issues were brought up during R1. These are summarised in the Table below, along with new issues raised in R2.

Table 105 - Strategic noise mapping issues - Finland

R1	R2
Stakeholders indicated that there is a sense of disproportionally between the technical and administrative action demanded and the actual benefits for noise assessment and management. Regarding noise calculation methods and technologies, the Finnish respondents indicated that any EU level methodology must be compatible with the resources, programming and calculation capacities available. It has been noted in Finland that most of the detailed calculation methods have been tested only for small areas, not appropriate for the Finnish case. Five years was considered a rather short time interval between revisions of SNMs.	Five years is considered a rather short time interval between revisions of SNMs. Seven to 10 years could be more efficient use of national resources as there tends to be no or only minor changes noted during the five-year intervals.

10.7 Noise action planning

10.7.1 Overview

The table below shows the SNMs and NAPs for Finland for Rounds 1 and 2 respectively.

Table 106 NAPs - Finland

	R1	R2
Agglomerations	1	7 (7)
Major airports	2	3 (3)
Major railways	1 (96 km)	8 (8) (375 km)
Major roads	1 (approx. 750 km)	8 (8) (approx. 2,100 km)

Source: ELY Centres

10.7.2 Methodologies for noise action planning

Guidelines were established at national level though the ELY Centres for drawing up and implementing NAPs. These were also used for R2. The Centres also provided general support and functioned as a forum for discussion and for advice. The 2006 maps were used as a basis for developing the NAPs in 2008: the NAPs are based on 'the most urgent areas' identified in the SNMs. Similarly, for R2, the 2012 SNMs were used for the subsequent NAPs. Other key criteria used for the two Rounds were health-based assessments and Finnish guideline values.

For aircraft noise there were a number of additional criteria, namely i) air traffic safety and capacity management, ii) land-use planning, and iii) population near but outside the area of the noise limit values.

10.7.3 Measures

For R1, NAPs were prepared for the City of Helsinki, Helsinki-Vantaa airport, and the busiest highways and railroads.

For R2, NAPs have been prepared for an additional six agglomerations, the busiest highways and railroads and additional airports.

Generally, a key challenge for implementation of measures covered in the NAPs – for all the NAPs prepared – is obtaining the necessary financial resources. As a result, the measures presented tend to focus more on the building of noise barriers, activities to encourage reduction in traffic such as by promoting public transport (rail) over private transport.

For the biggest agglomeration's – Helsinki's – NAP, the long-term goals for noise abatement have been presented up until the year 2020 and cover:

- Protecting people living in areas of high noise level (over 65dB);
- Targeting the actions for noise abatement in areas where multiple people have been exposed to ambient noise;
- Protecting citizens so that the noise level inside their homes does not exceed the guideline levels set by the Council of State;

- Lowering the noise level in other susceptible locations, in addition to habitation;
- Preserving relatively silent areas;
- Ensuring that noise level in recreation areas remains low enough;
- Encouraging taking noise abatement into account in community planning; and
- Establishing an extensive selection of means for noise abatement.

10.7.4 Public consultations

For R1, no information was provided on public consultations for the NAPs for the City of Helsinki. Regarding the NAP for Helsinki-Vantaa airport, a public consultation was undertaken simultaneously with the environmental permit application. Participants heard 21 statements from the authorities and 220 opinions from the citizens were given on the environmental permit application. All statements and opinions were observed in the NAP hearing process. A consultation on Helsinki-Malmö airport NAP was considered unnecessary because of the existing environmental permit (15.2.2008) and the fact that a noise control plan had already been implemented by then. The competent authority confirmed that public consultations have been undertaken as part of R2. According to the competent authority, there have been very few enquiries from the public (approx. 10-20) and very limited participation in the consultations. There is a general lack of interest from the public. In particular, Finland is a sparsely populated country and noise pollution is centralised to a select few areas.

10.7.5 Implementation issues

A number of implementation issues have been brought up. These are summarised in the table below.

Table 107 Noise action planning issues - Finland

R1	R2
Finnish respondents indicated that strategic noise mapping should be clearly defined as a strategic activity aimed at enabling further choice, greater precision and the selection of effective measures at subsequent and more detailed stages. They felt that the examples of actions provided in Annex V were unhelpful and should be included elsewhere (in Guidance).	
Finnish respondents noted that the period of one year between finalising SNMs and developing NAPs was too short and that communicating the methodology to the public was problematic. Seven years was proposed as an appropriate time interval between revisions of NAPs.	
	A key challenge for implementation is securing the financial resources for measures on *existing* infrastructure. With a lack of resources, NAPs tend to focus on (future) planning rather than existing infrastructure.

11. FRANCE

11.1 National implementing legislation for END

11.1.1 Legal implementation

Directive 2002/49/CE was transposed in France through a number of different pieces of legislation, namely:

- Decree n°2006-361 of 24 March 2006[98] and the Order of 4 April 2006[99] regarding the establishment of SNMs and NAPs (termed "prevention plans" in the French context have been).
- The decree of 3 April 2006 establishing the list of airports mentioned in Article I of R 147-5-1 of the Urban Planning Code.
- Circular 7 June 2007 on the implementation of the policy for combatting noise. These provisions are transcribed in Articles L 572-1 to 572-11 and R 572-11 to 572-1 of the Environmental Code.
- Circular 10 May 2011 on the organization and financing of the SNMs and NAPs respectively due in June 2012 and July 2013 –, DGPR-DGITM. http://www.cete-est.developpement-durable.gouv.fr/a-textes-reglementaires-r1460.html
- Methodological note for the production of SNMs of major terrestrial transportation infrastructures for round, May 2011. http://www.cete-est.equipement.gouv.fr/b-methodologie-r1461.html

The purpose of Decree n°2006-361 is to stop or limit noises emissions or vibrations that present a hazard for people's health or for the environment. It applies specifically to the prevention of sound nuisances (neighbour disturbance,), urban development and building houses near to transport infrastructure, as well as the protection from environmental noise pollution for those living in proximity to airports. The Decree provides for strengthening enforcement and mitigation measures against noise nuisance. The legal provisions for major airports were directly transposed into the Urban Planning Code (Article R.147-5-1).

Organisational arrangements for ensuring coordination between relevant actors in the development of SNMs were specified in the circular of 7 June 2007 of the Ministry of Ecology, Development and Sustainable Planning. This also provides guidelines for the methodology for preparing NAPs.

Prior to transposition, Law n°92-1444 of 31 December 1992 regarding the combatting of environmental noise already regulated noise levels in areas not addressed through sector-specific regulations.

11.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in France included 24 agglomerations, 9 airport(s), 983 km of railway and 12624 km of major roads. The introduction of definitive thresholds in R2 led to 34 *additional* agglomerations, and an

[98] http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000006053526

[99] Arrêté du 4 avril 2006 relatif à l'établissement des cartes de bruit et des plans de prévention du bruit dans l'environnement http://www.developpement-durable.gouv.fr/IMG/pdf/Arrete_du_4_avril_2006_sur_l_elaboration_des_cartes_de_bruit_et_des_PPBE.pdf

increase of circa 671% (+6300 km) in major railway lines. Major roads increased of circa 98 % (+12348 km).

Table 108 END coverage – France

Round	Agglomerations	Major airports	Major rail	Major roads
1	24	9	983 km	12,624 km
2	58	9	7,283 km	24,972 km

Source: EIONET country fiche, France, June 2014.

11.2 Competent Authorities and designated administrative bodies

In France, there is a largely decentralised approach to carrying out strategic noise mapping and noise action planning. This consists of state representatives in the Departments *("Préfet de département")* responsible for the designation of sites, the preparation of SNMs and the drafting of actions plans for major roads and railways and elected municipal bodies for the designation of sites, the preparation of SNMs and the drafting of NAPs for agglomerations. The overall approach to implementation and the role of different competent bodies is now summarised:

Table 109 Administrative Responsibility for the END – France

Role/Activity	Agglomerations	Roads	Railways	Airports
Data collection				French Ministry for Ecology, Energy, Sustainable Development and Energy
Preparing SNMs	Departmental territorial directorates (DDT) – working on behalf of the prefecture (préfet de département) Local authorities (communes and établissements publics à caractère industriel et commercial (EPCI)**	Départements (regional)* Local authorities (communes and établissements publics à caractère industriel et commercial (EPCI)** Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).	Departmental territorial directorates (DDT) – working on behalf of the prefecture (préfet de département) Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).	Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing NAPs	Departmental territorial directorates (DDT) – working on behalf of the prefecture (préfet de département) Local authorities (communes and établissements publics à caractère industriel et commercial (EPCI)**	Départements (regional)* Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).	Departmental territorial directorates (DDT) – working on behalf of the prefecture (préfet de département) Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).	Infrastructure managers (e.g. RATP for the rail network, state airport authorities, motorway authorities).
EC/EEA reporting	French Ministry for Ecology, Energy, Sustainable Development and Energy			

** There are 96 departments in metropolitan France (note – working in coordination with responsible national authorities)*

*** 729 local authorities and EPCIare involved.*

11.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

11.3.1 Data collection

In major agglomerations, data was generally available but was not centralised whereas in smaller agglomerations, data was not always available and had to be collected. Modelling estimates were used whenever actual data was unavailable. Since 1995, French roads have been classified by five noise level categories, with areas on the edge of roads flagged as "affected areas" where sensitive buildings, such as schools, hospitals and dwellings, need extra acoustic protection. These noise "hotspots" are required to be carefully monitored by the authorities.

11.3.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 110 Designation issues - France

R1	R2
Local authorities experienced difficulty in collecting data on roads, leading to estimates being provided by the State ministry based on previous data.	The same difficulties were encountered for R2, especially for roads with a low volume of traffic.
Data collection in major agglomerations has been slow. Data were available but not centralised, whereas in smaller agglomerations, data were not always available and had to be collected. Estimates were used when actual data was unavailable.	Same as for R1 with problems for small communities in agglomerations.
	Data collection for major rail infrastructures was accelerated by a centralised database from "SNCF réseaux" the public body in charge of

R1	R2
	rail infrastructure.

11.4 Noise limits and targets

11.4.1 Objectives and scope

In the following table, mandatory limit values for noise are specified. These were adopted through the order of 4 April 2006 regarding the establishment of SNMs and NAPs.

Table 111 Noise limit values – France, 2010

	Day dB (A)	Night dB (A)	Comments
Road traffic *	68	62	Motorways, national roads and High-Speed Railways (TGV)
Rail traffic *	73	65	All conventional national railways falling under scope of the END.
Aircraft around airports	55		All airports falling under scope of the END.
Industrial activity site	71	60	All industrial installations falling under scope of END

* *Based on L_{aeq} instead of L_{den}, limit values for Roads and TGV = 70dB (day) and 65dB (night); Conventional trains = 73dB (day) and 68dB (night)*

No specific enforcement system is foreseen if the above limit values are exceeded, but these limit values must be taken into account during the design and commissioning of new railways, roads or during industrial works.

11.4.2 Methods for establishing noise limit values

The Noise Observatory *(l'Observatoire du bruit)* based its limit values on the classification of roads and noise "hotspots". Current L_{den} limit values are based on previous L_{aeq} limit values. Furthermore, the Noise Observatory overlaid noise "hotspot" maps drawn up since 1995 and END SNMs to identify whether the earlier hotspots remained hotspots. This was then fed back to the French Ministry to help inform the debate on limit values

11.4.3 Implementation issues

No issues were raised as a result of END implementation in R1. In R2, no specific issues relating to limit values were raised.

11.5 Quiet areas

11.5.1 Overview

Quiet areas (*les zones calmes*) are defined in Article L.572-6 of the decree of 24 March 2006 amending the Environmental Code and the Town Planning Code did not impose a method to identify quiet zones. The definition of quiet areas in French law is defined in a way that is quite flexible as: "Outdoor spaces with low noise exposure, in which the authority that establishes the plan wishes to control the evolution of this exposure given the human activities practiced or planned". However, in the views of some stakeholders, this definition is not sufficiently clear.

Major delays were experienced in R1 in the identification and creation of quiet areas in France. This was attributed in earlier literature to different understandings as to what constitutes a quiet area and a lack of consensus as to how this should be defined[100]. In particular, stakeholders have debated whether this should only be based on noise exposure levels or whether it is necessary to take into account other criteria. However, quiet areas are implicitly identified in noise maps themselves. Whereas red indicates the noisiest zones, green in the maps indicates the quietest areas within a noise map.

Although a good practice document was developed in 2008 (described later in this section), in Round 2, delays in defining quiet areas have persisted. The national CA and other French stakeholders were not able to provide any data and information on quiet areas, although the EEA 2014 Noise in Europe report suggests that there is one quiet area in Lyon, no further information or weblink was provided.

Delimitation

The detailed criteria for the definition and delimitation of quiet areas are not specified in the French national regulations transposing the END. Rather, these are left to the discretion of the responsible CA in charge of developing the NAP *(Plan de Prévention du Bruit dans l'Environnement (PPBE)).*

Under Article L.572-6 of the Environmental Code does not impose a single method to identify and designate quiet areas. Rather, each municipality is able to determine appropriate methods and means under the responsibility of the prefect.

Acoustic criteria alone are insufficient to meet the definition of a "quiet area". CAs are therefore required to select criteria to help them to define quiet areas, such as specifying noise limit values or other non-acoustic measures.

In order to help CAs to better define quiet areas, a National Guide (*Guide national pour la définition et la création des zones calmes - synthèse du référentiel national)*[101] was developed in 2008. This provides a definition and suggested criteria for the creation of quiet areas. It also serves as a "national synthesis repository" for information about good practices in respect of quiet areas. The guidance document states that the process of identifying quiet areas in urban areas needs to take into account the lack of quiet in most urban areas and the importance of preserving acoustic quality in an urban environment wherever this is good. It is suggested that the selection of quiet areas should be based on "multiple criteria, notably acoustic character, the uses and functionality of the area with a focus on preserving quiet within the urban soundscape in places of leisure".

[100] See http://www.journaldelenvironnement.net/article/la-creation-des-zones-calmes-prend-du-retard,10226

[101] http://www.developpement-durable.gouv.fr/IMG/pdf/Referentiel_national_pour_la_definition_et_la_creation_des_zones_calmes_-_2008-2.pdf

According to the 2014 EEA's "Good practice guide on quiet areas", only selected competent authorities have developed criteria for the selection of quiet areas. In Lyons, for instance, the criteria are noise mapping results and "accessibility". However, it is not defined what these criteria actually mean. Implementation issues

Issues raised in R1 and R2, together with actions taken to address them are shown in the table below.

Table 112 Noise limits and targets issues – France

Issue - R1	Issue - R2
A National Guide was developed in 2008 on quiet areas. This provides a definition for the creation of quiet areas. The purpose of the development of guidance was also to help build up a "national repository of practices on quiet areas".	The French national competent authority stated that during R2, awareness-raising actions on quiet areas have taken place. The 2008 guidance document on quiet areas (and supporting toolboxes) have been disseminated. However, responsible CAs have still experienced difficulties in actually creating quiet areas.
Since no uniform national methodology was put in place in Round 1, differences in the definition of quiet areas between localities arose.	There has been a lack of budget for more concrete measures to be taken relating to the designation and subsequent protection of quiet areas.

11.6 Strategic noise mapping

11.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 113 SNMs - France

	Agglomerations	Major airports	Major railways	Major roads
R1	No data	9	88	2,168
R2	Roads (57)	8	176 (7,283 km)	3,978 (24,972 km)

Note – source EEA country report, EEA database of submitted NAPs. No bottom-up data provided by the national competent authority, although requested.

All 96 French départements are involved in the implementation of the END. In addition, at the level of the commune, a further 729 competent authorities are involved in noise mapping (according to an EEA country fiche on France from June 2014). However, there was some discrepancy in the numbers since the interviewee estimated 1200). The French CA commented that the numbers in the table represent a number of sets. Each set includes 5 different maps: L_{den}, L_{night}, the threshold on L_{den}, the threshold on L_{night} and noise classification.

In both Rounds 1 and 2, there have been problems in terms of the percentage completion of noise maps, especially for agglomerations where a decentralised approach has been adopted. According to the French national competent authority, some communes have not prepared noise maps in R1 or R2. This was attributed to a lack of budget and in some cases, an unwillingness to pay for noise mapping out of the municipal budget in smaller communes, when there was no dedicated state budget made available (unlike for noise mapping of major roads and other transport infrastructure outside agglomerations, which is paid for by the state.

By mid-2015, the position in respect of data completeness for SNMs was as follows:

Table 114 SNM data completeness

Round 1	Round 2
73% of noise maps approved	20% of noise maps approved

Source: interview with national competent authority, June 2015.

The situation has subsequently improved. The French CA has now taken steps to ensure that for those agglomerations where individual municipalities have refused to produce noise maps and action plans to adopt a "substitution" approach whereby the CA will pay for the SNM or NAP to be produced (albeit late). Funding support has been extended to those communes within municipalities that have recently entered within the scope of the directive due to the transition to the definitive threshold of the END, but where budget was either not available or the municipalities concerned (*communes)* refused to dedicate budget to noise mapping from their general budgets.

The estimated cost for the French state of producing these documents in the nearly 500 *communes* where they are presently missing during 2016 and 2017 is estimated to be 2 million euros. Approximately half of the SNMs and NAPs will be available by the end of 2016 and in late 2017 for the other 50%.

11.6.2 Data collection methods

For R1, data were largely provided by the IGN (National Geographic Institute) and presented in GIS form. There were delays caused by the need to collect data from different CAs.

Estimates of the number of exposed persons were quite difficult to obtain as the national population census is undertaken by household and not mapped in detail. The adopted method led to an over-estimation of the number of exposed people in R1. Since there is no mandatory method laid down in the END, this method was used by several cities, but not by all of them. Noise data from shipping traffic along inland waters has been included in agglomeration maps.

11.6.3 Strategic noise mapping methods

Only the minimum requirements in the Directive, L_{den} and L_{night} indicators, have been used for strategic noise mapping.

Several documents have been produced on strategic noise mapping methodologies for roads and railways by the SETRA (Service for Technical Studies for Roads and Motorways) and the CETE (Centre of Technical Studies on Equipment), for airports by the Civil Aviation Department, and for agglomerations by the CERTU (Centre for Studies on Networks, Transports, Town-planning and Constructions).

According to the Decree of 4 April 2006 on the establishment of SNMs and noise prevention plans in the environment, the measurement methods used in strategic noise mapping must comply with a number of French national standards, as well as international standards (aircraft noise).

The decree states that the methods of calculation must be consistent with the following international standards:

1 For industrial noise: ISO 9613-2: "Acoustics - Attenuation of sound during propagation outdoors, Part 2: General method of calculation

2 For aircraft noise: document of the European Civil Aviation Conference ECAC Doc. 29 " Report on Standard Method of Computing Noise Contours around Civil Airports

„, 1997, using the segmentation technique referred to in section 7.5 of ECAC Doc. 29;

3 For noise emitted by road and rail traffic: standard NF S 31-133:2007 or NMPB 2008 as soon as it was implemented in software: "Acoustics - Noise land transport - Calculation of the attenuation of sound during propagation outdoors environment, including meteorological effects."

In addition, the decree makes reference to the need for mapping to comply with the following French national standards:

- NF S 31-110 "Description and measurement of environmental noise - General Basic quantities and assessment methods";
- NF S 31-010 "Description and measurement of environmental noise - Specific measurement methods for other noise sources ";
- NF S 31085 " Description and measurement noise due to traffic ";
- NF S 31-088 "Measurement of noise due to rail traffic for its characterization for rail noise".

Looking ahead, France will in common with other EU countries be making the transition to the use of CNOSSOS common assessment methods.

11.6.4 Public accessibility of SNMs

Some transport infrastructure maps have been published by public authorities on their websites and are accessible to the public. Examples are the Préfecture of Bas-Rhin[102].

Making SNMs publically available is easier for roads and railways because different governments departments are responsible and where the French State was responsible for the development of SNMs and NAPs, these have tended to be adopted and published on a more timely basis than is the case for agglomerations (where municipalities are responsible). The publication of SNMs can only take place once they have been approved by the electoral body of the local authority in charge. It can therefore take considerable time before SNMs are published. Some local authorities have produced and published their SNMs however, and they are available on their website: e.g. *Communauté de Rennes*[103]:

CARTELIE is an application developed by the Ministry of Ecology, Development and Sustainable Development (MESD) to facilitate the publication of maps on the Internet relating to local geographical information and national standards. R1 maps for major roads[104] and major railways[105] were published for France as a whole on the MESD website. In R2, there were delays in the publication and availability of SNMs, especially for agglomerations.

Noise maps for major roads are produced at a departmental level and have typically been published. An example of a noise map published at departmental level is

[102] http://www.bas-rhin.gouv.fr/Politiques-publiques/Environnement-prevention-inondation-et-prevention-risques-technologiques/Bruit-des-transports/Bruit-des-transports-terrestres-dans-l-environnement/Cartes-de-bruit-strategiques-echeance-2012

[103] http://metropole.rennes.fr/politiques-publiques/environnement-economie-recherche/l-environnement/le-plan-bruit/

[104] http://cartelie.application.developpement-durable.gouv.Fr/cartelie/voir.do?carte=Reporting2007route&service=CEREMA

[105] http://cartelie.application.developpement-durable.gouv.Fr/cartelie/voir.do?carte=Reporting2007fer&service=CEREMA

available from the following website: http://www.territoire-de-belfort.gouv.fr/Politiques-publiques/Environnement/Bruit/Les-cartes-strategiques-du-bruit-des-infrastructures-routieres-du-Territoire-de-Belfort. This relates to the A36 *autoroute* and the main road RN1019.

For agglomerations, in R1, individual regions and communes have published noise maps and made these available online. In R2, however, there have been major delays in making SNMs publicly available. As noted earlier, the French government has recently recognised that there are nearly 500 *communes* where neither a SNM nor a NAP has yet been finalised, adopted and published. These will only be produced during 2016 and 2017 which means that they will be published several years late. Moreover, a further significant problem is that under the French approach to implementation, in an agglomeration where there are multiple noise maps being produced, the SNM for the agglomeration as a whole cannot be considered complete until all SNMs have been submitted and approved. This has therefore meant that even if the majority of SNMs are available, their publication has been highly fragmented and frequently delayed.

The role of NGOs / the not for profit sector and public sector organisations in raising awareness about environmental noise related issues should also be noted in France. For example, the Centre for Information and Documentation on Noise (CIDB - http://www.bruit.fr/) is a resource centre and information dissemination dedicated to promoting the quality of our sound environment. Information is available via its website that provides access to noise maps and to action plans. Consult www.bruit.fr/boite-a-outils-des-acteurs-du-bruit/cartes-de-bruit-et-ppbe/

Since France has implemented the END in a strongly decentralised way, the picture in terms of noise maps and action plans is quite fragmented. Therefore, organisations that bring this information together in an accessible way, such as the CIDB mentioned above, are quite useful. For example, the CIDB website brings together some (though not all) of the noise maps for large agglomerations[106].

The noise observatory in Paris (http://www.bruitparif.fr/en), which focuses on noise in the Ile de Paris region, fulfils a similar role. It was mentioned during the interviews that gaining access to noise maps is highly fragmented in France. For instance, in Paris, there are very many separate noise maps rather than a single noise map covering the whole Paris agglomeration.

11.6.5 Implementation issues

A number of issues were raised as a result of R1 relating to noise mapping, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 115 Strategic noise mapping issues - France

R1	R2
Multiple-exposure in agglomerations was not taken into account. However, multi-exposure maps are not required in the END	Still valid
Industrial installations in agglomerations were mapped from numerous small sources at the edge of sites, resulting in local authorities having to redo industrial SNMs in agglomerations	Still valid

[106] See for instance www.bruit.fr/boite-a-outils-des-acteurs-du-bruit/cartes-de-bruit-et-ppbe/exemples-de-cartes-publiees/cartes-strategiques-du-bruit-dans-les-grandes-agglomerations.html.

R1	R2
A concern as to whether the future use of an EU-wide common assessment methodology would be better than the existing national approach, which was considered to be superior.	Transition to CNOSSOS from R4.
	Although individual noise maps are accessible, access is highly fragmented since there are a large number of noise maps overall. It is difficult to obtain an overview. However, NGOs/ not-for-profits have helped to bring together links to noise maps from a wide range of sources though portals which provide an overview[107].

11.7 Noise action planning

11.7.1 Overview

An overview of the number of NAPs submitted in France in R1 and R2 is shown in the following table.

Table 116 NAPs – France

	R1	R2
Agglomerations	57	19
Major airports	9	9
Major railways	29	53
Major roads	253	129

Source: First implementation review fiche and the EEA. For roads, data was provided directly by the French national CA. Note – this only relates to data that has been accepted as complete by the French national authorities and published rather than the number of NAPs expected.

The figures in table above relating to agglomerations refer to the number of NAPs produced. In many instances, several NAPs have been produced for one agglomeration. Hence, the number of NAPs for R1 agglomerations is higher than the total number of agglomerations within END scope.

There have however been considerable delays in the development of NAPs in both Rounds 1 and 2, with many NAPs not formally approved by the responsible authorities. This is shown in the following table, which is an estimate provided by the national competent authority in respect of the position on data completeness for NAPs in mid-2015:

Round 1	Round 2
20% of noise action plans approved	10% of noise action plans approved

Source: interview with national competent authority, June 2015.

[107] www.bruit.fr/boite-a-outils-des-acteurs-du-bruit/cartes-de-bruit-et-ppbe/exemples-de-cartes-publiees/cartes-strategiques-du-bruit-dans-les-grandes-agglomerations.html.

In July 2016, additional data was provided by the Competent Authorities, according to which only 4 (Round 1) and an additional 3 (Round 2) agglomerations have published *all* their NAPs – a total of 7.

The interview with the national CA with overall responsibility for END implementation and reporting to the EC in France identified possible explanatory factors as to the lack of data completeness, such as the fact that within agglomerations, a very fragmented approach has been adopted to noise mapping and some communes have refused to produce a noise map, leading to considerable delays in noise mapping and action planning processes.

A lack of budget at local level was also cited by the CA as a reason for delays in NAP development for agglomerations. There was also concern among some CAs at the local level that if they published a NAP, and identified expenditure measures, they would not have the budget to follow through and actually implement measures. The CA confirmed that whilst significant national investment has been made in noise abatement and mitigation for major roads and through a national insulation scheme for airports, a problem is that municipalities do not have funding for noise mitigation.

An example of the type of problems encountered in respect of the timely submission of END reporting data in France was the case of **major roads**. In R1, in France, 253 NAPs were meant to be produced for major roads, including 96 that were due from the state. Of this total, 157 have so far been submitted (62%). Of the total 253, a total of 97 were due to be produced by the French state covering state roads. Of these, 87 have already been submitted (i.e. circa 90%). This demonstrates that there is a specific problem in relation to highways and smaller, departmental roads where other administrative bodies such as county councils are responsible for producing NAPs, which accounts for the remainder of the road NAPs due to be submitted. As with noise mapping, delays are partly attributable to budgetary availability at a non-State level.

In relation to **agglomerations**, part of the reason for the delays is that in urban areas of France, there are often a number of different NAPs produced by different CAs. Therefore, a given city is only considered to have completed their obligations in respect of the finalisation and adoption of NAPs when all the different urban areas that collectively make up a large town or city have adopted and published their NAP. So even in a situation within an agglomeration where 90% of municipalities have published their NAP, since all the NAPs have not yet been completed, this means that the city concerned has not met their overall reporting requirements to the French national CA. Many French cities are in this situation. For example, the agglomeration of Lille (1 million people) has conducted and approved its overall NAP but since the NAPs for some urban districts within the Lille conurbation have not published their NAP, the overall NAP has not yet been published. Consequently, Lille is not reflected in the statistics. According to the French national CA, several cities are in the same situation.

The French CA has also taken steps in 2016 to compel municipalities that have taken several years to produce a NAP to actually publish the NAP, since otherwise this cannot be considered as completed from an END reporting perspective. The CA is also launching "Round 3" (Review and if necessary the revision of R2 documents for 2017 and 2018).

11.7.2 Methodologies for noise action planning

At the request of the Ministry of Ecology and Sustainable Development, *Guidance for the development of NAPs*[108] was produced by ADEME *(l'Agence de l'Environnement et de la Maîtrise de l'Énergie) i*n 2008.

Before the adoption of the END, French noise policy was already centred on the development of Prevention Plans for Noise in the Environment (PPBE), which was a mechanism through which the state services could put in place anti-noise measures and draw up draft NAPs. However, a key difference was that actions and measures did not have to be based on SNMs. A bill of 23 July 2008 from the Directorate General on Risk Prevention and the Directorate General on Infrastructures, Transports and Sea sets out the methodology for Noise action planning and states explicitly that the 2006 SNMs used by the Directorate for Infrastructure Development in the Departments (which is in charge of Noise action planning on behalf of the *Préfet*) should form the basis for Noise action planning.

11.7.3 Measures

Among the main selection criteria for selecting measures were prioritising measures in areas affected by high population exposure and the level of implementation costs.

Among the noise abatement measures identified in R1 NAPs in France were traffic planning, land-use planning, technical measures at noise source, insulation, the reduction of sound transmissions and incentive measures (to encourage investment in insulation). In R2, broadly similar types of measures were being supported in the sample of PBBE consulted by the study team. There was however in the case of major roads a greater emphasis on quiet road surfaces where a nationally funded scheme has been supported. In terms of expenditure, *EUR50m on noise mitigation for roads is made available annually from the state budget and a further EUR50m from the collectivités i.e. EUR100m per year.* It was also noted by the national CA that some measures pre-exist the adoption of the END. For instance, a soundproofing aid assistance system is provided in the noise French law since 30 December 1992. There were problems in ensuring sustainable funding for insulation in the early years so it has in practice been implemented since the late 1990s only and using the state budget. It was noted however that "the directive has greatly increased the volume of aid for noise insulation".

Another key development was that in 2003, the French government created the TNSA, which is tax that has been paid since 1 January 2005 by airlines under the "polluter pays" principle. This has raised significant funding to reinvest in noise insulation and other measures to mitigate noise. Another criterion for taking action at the national level is the noise exceedance level.

11.7.4 Public consultations

The 2006 decree transposing the END states that public consultations should take place on the same basis as normal public consultations for impact assessments (as defined in Law "Bouchardot" of 12 July 1983).

There were delays during R1 in public consultations getting underway, although the role of public consultation was foreseen in the 2006 decree and is built into the approval process for NAPs. Depending on the type of NAP, consultation is organised by the state services (in the case of major roads and infrastructure outside agglomerations) and by local authorities (agglomerations).

[108] http://www.developpement-durable.gouv.fr/IMG/pdf/Guide_pour_l_elaboration_des_PPBE_-_ADEME_-_2008-2.pdf

In R2, public consultation often took place later than expected, in 2014 and extending into 2015, with many R2 NAPs consequently not finalised until 2015, compared with the 2013 deadline.

The general approach to consultation relating to Noise action planning in France is as follows:

- Following the preparation of a draft NAP, a statutory public consultation takes place over a 2-month period.
- Responses can be submitted either electronically or in writing.

An example of public consultation in France is now provided:

Public consultation in the Isère region in France

In order to inform the finalisation of the draft NAP for the Isère region for the 2013-2018 period, a public consultation was organised. This focused on national major roads infrastructure (roads, motorways) passing through the Isère region and in respect of major railways.

The public consultation[109] ran for a 2-month period from 15th September to 15th November 2014. Residents were able to reply either electronically or by mail but only one commune and three residents responded to the 8-week consultation. Following this consultation, the regional authority carried out a synthesis assessment of the consultation responses. Managers of transport infrastructure mentioned in the NAPs provided a response to the public consultation feedback received. The final document was by approved by the prefect on May 25, 2015 and accompanied by a supporting note setting out the consultation results.

Example of a public consultation from the Alpes-Maritimes area - http://www.alpes-maritimes.gouv.fr/Actualites/Breves/Consultation-publique-sur-le-plan-de-prevention-du-bruit-de-l-autoroute

Although many public consultations in France have already been finalised, not all R2 public consultations have yet been completed. For instance, in the area of major roads, the public consultation period for the *Plan de Prévention du Bruit dans l'Environnement du réseau autoroutier concédé dans les Alpes-Maritimes* ran from May 11th to July 11th 2015.

11.7.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with any subsequent actions taken to address them, and new issues raised during R2.

Table 117 Noise action planning issues - France

R1	R2
Guidance was sought on the contextual format of the plans (whether the PPBE should be presented under a text format or an electronic format for instance).	The length of time between the submission of SNMs and the development of NAPs was problematic in many regions. Public consultation was still ongoing in mid-2015 in some *départements* and *régions* whereas the NAPs should have been published before the end of 2013.

[109] http://www.isere.gouv.fr/Politiques-publiques/Environnement/Bruit/Directive-europeenne-du-bruit-dans-l-environnement/Plans-de-prevention-du-bruit-dans-l-environnement-en-Isere

Coordination of various responsible bodies	
Multi-exposure measurement	The challenge of assessing the cumulative effects of noise across different sources has not been addressed. Although not required in the END, some CAs would like to be able to do this to engage with citizens more.
PPBE are currently not synchronised with the revision of road classification, which also takes place every 5 years. Once these are synchronised, CAs will then be able to ensure complementarity in revising documents relating to road noise levels.	Now synchronised.

12. GERMANY

12.1 National implementing legislation for END

12.1.1 Legal implementation

The END is implemented at federal level through the Law for the Implementation of the EU Guidelines on the Evaluation and Abatement of Environmental Noise (*Gesetz zur Umsetzung der EG-Richtlinie über die Bewertung und Bekämpfung von Umgebungslärm*). The law came into force on 30th June 2005[110] and has been incorporated into para. 47a-47f of the Federal Emissions Protection Law (*Bundesimmissionsschutzgesetz (BImSchG)*). The Federal Ordinance on Strategic Noise Mapping, which came into force on 16th March 2006 (*34. BImSchV, Verordnung für die Lärmkartierung*)[111], sets out technical requirements and establishes European L_{den} (day-evening-night noise indicators for overall annoyance) and L_{night} (night-time noise indicator for sleep disturbance) as the basis for Strategic noise mapping.

This Ordinance is complemented by non-binding Technical Guidelines for Strategic Noise Mapping (*Hinweise für die Lärmkartierung*)[112] and Noise Action Planning (*Hinweise für die Lärmaktionsplanung*)[113] produced by the Federation of Federal States' working group on emissions protection, as well as guidelines drafted by individual Federal States (Länder).

12.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Germany included 40 agglomerations, 8 airport(s), and approximately 17,000 km of major roads and 7,400 km of major railways.

The introduction of definitive thresholds in R2 led to 48 *additional* agglomerations and 14 *additional* airports being covered as well as an increase in coverage of major railway lines to 16,795 km and major roads to 48,587 km.

Table 118 END coverage – Germany

Round	Agglomerations[114]	Major airportsError! Bookmark not defined.	Major rail[115]	Major roads[116]
1	40	8*	7,400 km	17,000 km
2	88	22*	16,795 km[117]	48,587 km[118]

** numbers include NAPs produced for districts bordering airports, EEA data for 11 airports in R2*

[110] In: Federal Law Gazette vol. 2005, chapter I, pp. 1794 ff.

[111] In: Federal Law Gazette vol. 2006, chapter I, pp. 516 ff.

[112] http://www.umweltbundesamt.de/sites/default/files/medien/pdfs/LAI-Hinweise_Kartierung.pdf

[113] http://www.lai-immissionsschutz.de/servlet/is/20170/LAI-Hinweise.pdf?command=downloadContent&filename=LAI-Hinweise.pdf

[114] As reported to the EC.

[115] In: http://www.eba.bund.de/DE/Service/FAQs/Laerm/faq_laerm_node.html

[116] http://www.lai-immissionsschutz.de/servlet/is/20170/LAI-Hinweise.pdf?command=downloadContent&filename=LAI-Hinweise.pdf

[117] EIONET data analysis

[118] EIONET data analysis

12.2 Competent Authorities and designated administrative bodies

Strategic noise mapping as well as noise action planning for agglomerations and roads prevalently is a responsibility of the municipal authorities. Some federal states however carry out the mapping of main roads and airports in order to support the municipalities. Others such as the federal state of Hesse carry out strategic noise mapping as well as noise action planning state-wide for these noise sources without municipality involvement. Strategic noise mapping of railways falls within the competence of the Federal railway authority (*Eisenbahn-Bundesamt*) and is carried out on a national level.

Federal State authorities are each responsible for collating maps and reporting to the Federal Ministry of the Environment, Conservation and Reactor Safety (*Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit)*, which in turn is responsible for providing completed SNMs as part of the reporting process to the European Commission.

Table 119 Administrative Responsibility for the END in Germany

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing & approving SNMs	Municipalities and Federal States	Municipalities and Federal States	Federal Railway Authority and Federal States	Federal States
Preparing NAPs	Municipalities, regional authorities and/or Federal States	Municipalities, regional authorities and/or Federal States	Municipalities, regional authorities and/or Federal States	
Approving NAPs	Authority responsible for preparing the NAP	Authority responsible for preparing the NAP	Authority responsible for preparing the NAP	
EC/EEA reporting	Federal Ministry of the Environment, Conservation and Reactor Safety Federal States			

The large number of responsible administrative authorities involved in strategic noise mapping and noise action planning, reflects the federal state structure and the decentralised arrangements extending to the municipality level. As an example, the number of responsible authorities in the Federal State of Bavaria for noise action planning are summarised in the following table.

Table 120 Responsible administrative authorities for the END in Bavaria (Noise action planning)

	R1	R2
Municipalities incl. agglomerations	77	294
Federal State of Bavaria	9	9

According to a German Acoustics Association[119], this decentralised approach quite often meant that administrative entities lacked competence, i. e. rural communities adjacent to a major road or railway line lacking the possibilities to implement source-related measures. However, a recent revision of the corresponding law now obliges the German Railway Agency EBA to design the NAP for major railway lines.

An implementation issue highlighted by a German Acoustics Association is that the designation of CAs on a decentralised level lead to some responsible authorities lacking the competence to impose measures in their vicinity – this has since been revised, however.

11.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

12.2.1 Data collection

Data to delimitate major roads, railways, airports and agglomerations according to the definitions of END was available for both Rounds and were provided from the Federal states.

Under the directive of BImSchG (Bundes-Immissionsschutzgesetz), agglomerations are defined as areas with more than 100,000 residents and a population density of more than 1,000 residents per square kilometre. The Federal states mainly used the municipal borders to define agglomerations. Some agglomerations were also defined by functional or urban relation.

Major roads under the directive of BImSchG are national and state roads with a traffic volume of 3 million motor vehicles per year.

12.2.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 121 Designation issues - Germany

R1	R2
Lack of clarity on the use of administrative and political boundaries or population thresholds and density.	To achieve community understanding the authorities are encouraged to communicate the compulsory mapping coverage to the public.
Lack of political willingness at regional level and among local authorities at municipality level to classify which areas crossed national borders as agglomerations.	For agglomerations it is recommended to extend the mapping to the requirements of the NAP. This implicates the mapping of the main road network as a minimum.
Much frequented municipal roads were excluded from the NAP in the first round, which led to an incomprehensive mapping outside of agglomerations. This was difficult to explain to the communities that also experienced noise problems and averted a regional observation of road network structures.	Within R2 of noise action planning, municipalities often recalculated the SNMs and added noise relevant local roads falling into END scope (more than 3 million cars/year). This led to more comprehensive mapping outside of agglomerations.
Indistinct information in the END regarding noise sources other than the main sources. This led to incomplete collection of data	Indistinct information in the END regarding noise sources other than the main sources

[119] Noise Control Association of the German Acoustical Society

R1	R2
and lack of understanding in the community.	remains an issue.

12.3 Noise limits and targets

12.3.1 Objectives and Scope

12.3.2 Purpose

The primary aim of noise related regulations as constituted in para. 1 BImSchG is to provide precautions against harmful effects on the environment and humans. This includes health risks as well as considerable disadvantages and nuisances. To ensure compliance, adherence with limit values is verified in advance. Therefore, exceedance of noise limits is prevented by the provisions in the planning stage of a development. In case of airports, only passive noise reduction measures are applied.

There are three broad sets of noise limit values in Germany. These cover:

- Installations
- Road and railway traffic
- Aircraft and airports

12.3.3 Installations

Noise emitting from installations is regulated by the *Federal Emission Control Act* (BImSchG) and the associated Technical Instruction on Noise Abatement (*Technische Anleitung zum Schutz gegen Lärm (TA Lärm*[120]), as per § 48 BImSchG). The TA Lärm sets noise limit values, but is normally not legally binding as an administrative provision. However, the Federal Administrative Court has established in its rulings that technical administrative provisions that further detail the related legislation are generally legally binding not only for administrative bodies but also for the national courts[121]. Values are generally applicable indicators, but deviations are permissible in individual cases.

Table 122 Limit values for noise from installations - Germany

Land-use type	Noise limit values	
	Day dB (A)	Night dB (A)
Industrial	70	70
Commercial	65	50
"Core areas", villages and mixed areas	60	45
General residential areas and small residential estate	55	40
Pure residential	50	35

[120] In: Official Ministry Gazette No. 26 of 28 August 1998 pp. 503 ff.

[121] Whyl-judgement, in: Official Collection of the Federal Administrative Court's decisions, BVerwGE 72, 300, 320.

Spa districts, next to hospitals and nursing institutions	45	35

12.3.4 Road and railway traffic

The noise limits stipulated in the *Traffic Noise Protection Ordinance (Verkehrslärmschutzverordnung, 16 BImSchV)*[122][123] must be observed during construction of, or essential changes to, public roads and railways for local and long-distance transport.

Table 123 Limit values for noise from road and rail traffic - Germany

Land-use type	Noise limit values	
	Day dB (A)	Night dB (A)
Next to hospitals, schools, rehabilitation centres and retirement homes	57	47
Pure and general residential areas and small residential estate areas	59	49
In "core areas", villages and mixed areas	64	54
Commercial	69	59

12.3.5 Airplanes and airports

The Act on Aircraft Noise (*Fluglärmgesetz/FluLärmG*)[124] sets out day and night protection zones (areas surrounding an airport, where certain noise levels are exceeded). In such zones, noise remediation must be provided and, if not sufficient, certain forms of land use are prohibited, such as the building of hospitals, retirement homes, rest homes and similar facilities. In some cases, the owner of an effected property must be compensated.

Table 124 Limit values for noise from airports - Germany

	Civil		Military	
	New build or extended dB(A)	Existing dB(A)	New build or extended dB(A)	Existing dB(A)
Day-Protection zone				
1: L_{Aeq} day =	60	65	63	68
2: L_{Aeq} day =	55	60	58	63
Night-protection zone				
L_{Aeq} Night =	50	55	50	55
L_{Amax} =	6 times 53	6 times 57	6 times 53	6 times 57

[122] In: Federal Law Gazette vol. 1990, chapter 1, pp. 1036 ff.

[123] 16BImSchV, Verordnung zur Änderung der 16. Verordnung des Bundesimmissionsschutzgesetzes _April_2014

[124] In: Federal Law Gazette vol. 2007, chapter 1, pp. 2551 ff.

12.3.6 Non-binding target values

Neither the BImSchG nor the 34. BImSchV establish legally binding trigger thresholds for NAPs, although para. 4 of the latter states that SNMs[125] must graphically depict noise values, the exceedance of which can trigger a requirement for noise action planning and mitigation measures.

The German Federal Environmental Agency (*Umweltbundesamt/UBA*) recommends non-binding trigger thresholds for NAPs.[126]

Table 125 Umweltbundesamt non-binding trigger thresholds for NAPs - Germany

Objectives	Time frame	L_{den} dB (A)	L_{night} dB (A)
Avoidance of health hazard	Short-term	65	55
Reduction of substantial noise disturbance	Medium-term	55	45
Avoidance of substantial noise disturbance	Long-term	50	40

The Federal States of Brandenburg, Saxony and Schleswig-Holstein provide municipalities within their jurisdiction with threshold and orientation values similar to the UBA's short- and medium-term recommendation. Other Federal States operate with higher trigger thresholds that do not completely eliminate the possibility of substantial noise disturbance and health hazards.

12.3.7 Implementation issues

Germany has a very detailed sectoral legal regime for noise. This includes:

- Bundes-Immissionsschutzgesetz, including requirements for protection against harmful effects on the environment, e.g. noise from industry and trade installations, municipal roads and railways
- Verkehrslärmschutzverordnung (16. BImSchV) specifying emission limit values for construction and extension of municipal roads and railways
- Verkehrswege-Schallschutzmaßnahmenverordnung (24. BImSchV) including requirements to the nature and extent of noise protection measures
- Noise abatement programme for existing state roads since 1978
- Noise abatement programme for existing state railways since 1998
- Act on Aircraft Noise
- Regulation on data collection and calculation procedures for determination of noise protection areas (1. FlugLSV)
- Schallschutzverordnung (Directive for noise protection)
- Technische Anleitung zum Schutz gegen Lärm - TA Lärm including emissions limit values for industry and trade installations

[125] The BMU reported to the European Commission noise limit values for noise maps (Art. 5 subsection 4 END). However, these values were not incorporated in the LAI' s non-binding technical guidelines for noise mapping.

[126] German Federal Environmental Agency: http://www.umweltbundesamt.de/themen/verkehr-laerm/umgebungslaermrichtlinie/laermaktionsplanung

In 2010, noise abatement programmes at a federal level were increased to € 50 million for existing federal highways and to € 100 million for federal railways. Additionally, in the framework of the "economic stimulus package two" (Konjunkturpaket II) the Bund (federal level) made another € 3.5 billion available which could, inter alia, be invested in noise management measures.

12.4 Quiet areas

12.4.1 Overview

Quiet areas are solely defined for agglomerations within the framework of noise action planning, with various approaches being used on definition and delimitation. In a R1 survey, 30 % of the municipalities confirmed they had identified quiet areas. No data is yet available in the framework of NAP production for R2. The table below shows selected major agglomerations where quiet areas are identified or have already been established.

Table 126 Quiet areas in selected major cities

Agglomeration	Number of quiet areas	Determination between
Berlin	11 37	- quiet areas (according to END) and - inner city recreational areas (smaller areas, quieter than surroundings)
Bremen	> 20 > 30 > 90	- quiet regional zone - quiet agglomeration zone - city oasis
Hamburg	52	Quiet areas in the future to be determined between especially quiet regional zone / quiet agglomeration zone / inner city space / quiet axis / city oasis
Munich	11 17 17	Recommendations on the establishment of quiet areas as follows: - quiet areas - inner city recreational areas - landscaped recreation areas

Definition

There is no legal definition of quiet areas, but Para. 47a of the BImSchG stating environmental noise provision also applies to quiet areas in agglomerations and rural areas as defined by the END.

Non-binding Technical Guidelines for Noise action planning "*Hinweise für die Lärmaktionsplanung*" indicate that the determinant factor as to whether an area can be defined as a quiet area is that the area is not exposed to noise from traffic, industrial, commercial or leisure activities. The area's location alone is insufficient to be deemed a quiet area. The extent to which there are economic activities taking place in the area needs to be taken into account. The competent municipality also needs to determine that the area is covered by a NAP. Whether an area contains buildings is irrelevant.

Among the criteria for being defined as a *quiet area in the countryside* are large-scale areas that are not exposed to anthropogenic noise, except for noise due to forestry and agricultural use. Mapped areas judged not to be noisy are also potential quiet areas, as well as areas with sound levels below L_{den} = 40 dB (A). Quiet areas in the countryside are not usually defined since relevant areas are not covered by the END mapping targets.

Quiet areas in agglomerations are characterised as quiet landscape areas, and generally represent naturally preserved spaces or those used by forestry and agriculture. Various approaches are adopted in order to define quiet areas in agglomerations as presented in the following section.

Delimitation

The Technical Guidelines for Strategic Noise Mapping leave the determination of quiet areas under NAP development to the discretion of the CAs. Usually, threshold values in between L_{den} 50 and 55 dB(A) are applied. Many cities also use a differential value e.g. 6 dB(A) to distinguish the border and inner centre of a quiet area. In some cases, a minimum area size is determined and more often quiet areas are further categorised based on noise levels, location, size and accessibility.

12.4.2 Implementation Issues

No issues were raised as a result of END implementation in R1 as the focus was on NAP production rather than quiet areas. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 127 Quiet area implementation issues: R2

Issue	Action
Definition of quiet areas as well as the legal consequences are unclear. Depth of Strategic noise mapping is insufficient to identify quiet areas on the basis of the noise level values.	Some federal states have identified quiet areas by the means of reverse strategic noise mapping thus identifying areas with low noise levels to assist municipalities in establishing quiet areas. Consideration on planning requirements to allow for adequate protection.

12.5 Strategic noise mapping

12.5.1 Overview

An overview of SNMs produced in Rounds 1 and 2 as reported to the EC is shown below.

Table 128 SNMs - Germany (as reported to the EC[127])

	R1	R2
Agglomerations	35	72 (88)
Major airports	8	13 (22)
Major railways	4	1* (16,795 km)
Major roads	9	14 (48,587 km)

** Maps of 16 federal states combined in one map from Federal Railway Authority.*

[127] http://cdr.eionet.europa.eu/de/eu/noise/df8/coluk47sq (as of 2012) and http://cdr.eionet.europa.eu/de/eu/noise/df8/colvi7k8q (updated 2014)

12.5.2 Data collection

Para. 3 of the BImSchV empowers CAs to order data required for strategic noise mapping free of charge from authorities and natural and legal persons who run certain noise emitting facilities, for example railways, transport companies, civil airports, and harbours.

During R1, many Federal State bodies used GIS technology to collect, compile and conflate data. E.g. Bremen and Bayern also engaged external consultants to carry out data collection. Mecklenburg-West Pomerania stores data in a different format allowing easy access to it by the municipalities.

During R2, in some states, e.g. in Baden-Württemberg, external consultants were assigned to improve the database. In North Rhine-Westphalia, a state wide database was held available consolidating several data sources: Geobasis. NRW supplied data on buildings and topography and Straßen. NRW provided details on road traffic and noise protection structures.

Overall, the method of data collection of R1 was maintained in R2.

12.5.3 Strategic noise mapping methods

The legal regime for Strategic noise mapping is based on:

- Para 4 of 34. BImSchV, which states that SNMs must:
  - Comply with the minimum requirements set out in Annex 4 of the END
  - Be developed separately for every type of noise on the basis of L_{den} and L_{night}
- Para. 4 of the 34. BImSchV regulates the noise levels to be graphically depicted with noise contours in the SNMs and the corresponding colours, according to DIN 18005[128].

Major noise sources, area categories, cities, villages, rural areas and urban areas and land use must be graphically depicted.

A SNM must also:

- Provide information on existing or planned naps, and include a table showing the areas exposed to noise.
- Depict the exceedance of a trigger threshold for potential or actual Noise action planning.

Provisional calculation methods can be found in para. 5 of the 34. BImSchV in connection with published calculation methods of the competent ministries. Complementing the 34. BImSchV, the Federal States working group for emission protection (LAI) has developed non-binding technical guidelines "*Hinweise zur Lärmkartierung*"[129].

[128] DIN 18005 part 2, September 1991, published by the Beuth Verlag GmbH, 10772 Berlin and archived in the German Patent and Trade Mark Office in Munich.

[129] http://www.mufv.rlp.de/fileadmin/img/inhalte/laerm/neu_LAI-Hinweise-Laermaktionsplanung.pdf

As the END does not provide harmonised calculation methods for noise indicators, national procedures are used, based on the Provisional Calculation Methods defined in 2006[130]:

12.5.4 Public accessibility of SNMs

The German Federal Railway Authority, the Federal States and the agglomerations have published digital SNMs. The R1 maps were provided in the previous legal implementation review. Information sources relating to Round 2 implementation are usually provided through interactive noise maps on the official internet sites of the federal state agencies[131] as well as the internet site of the Federal Railway Authorities for noise maps relating to railway noise[132].

12.5.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

The main effort – about 90 % - in meeting the strategic noise mapping requirements consisted of the acquisition, processing and preparation of a vast amount of input data. This led some federal states to support small municipalities by conducting Strategic noise mapping through a central department. In R2 larger cities that had already experience from the previous round where able to resolve issues easier.

Table 129 Strategic noise mapping issues - Germany

R1	R2
Generating sufficient data to provide valid estimates of individuals exposed to noise	Road traffic census 2010 to be conducted in a timely manner to generate reliable data for R2 in 2011
Generating data for graphical depictions of houses, schools and hospitals exposed to noise and exceedance of trigger thresholds	Recommendation to the municipalities to start collating data early in the process of R2.
Differing quality of input data	Achieve assurance for easy access to geographical data through federal guidelines and support from the CAs.
Varying data sources let to mismatching noise levels along adjoining mapping areas	Access to population data to be available through a central department to ensure data protection.
Lack of human and technical resources	

[130] Provisional Calculation Methods for Environmental Noise from Roads (VBUS)
Provisional Calculation Methods for Environmental Noise from Railways (VBUsch)
Provisional Calculation Methods for Environmental Noise at Airports (VBUF)
Provisional Calculation Methods for Environmental Noise from Industry and Commerce (VBUI)

[131] E.g. Brandenburg: http://udo.lubw.baden-wuerttemberg.de/public/pages/map/default/index.xhtml

[132] http://laermkartierung1.eisenbahn-bundesamt.de/mb3/app.php/application/eba

12.6 Noise action planning

12.6.1 Overview

An overview of NAPs reported to the EC is shown in the table below.

Table 130 NAPs – Germany (as reported to the EC[133])

	R1	R2
Agglomerations	40	88
Major airports	3	22
Major railways*	196	324
Major roads	678	1,801

12.6.2 Methodologies for noise action planning

The "Hinweise zur Lärmkartierung" (National Guidelines for Noise Action Planning), developed by the Bund-Lander working group on emissions protection, are non-binding recommendations. Brandenburg, Hamburg, Hesse, North-Rhine Westphalia, Saarland and Schleswig-Holstein have developed supplementary guidelines.

CAs at the regional level introduced noise trigger thresholds to the SNMs. If these are exceeded, noise action planning *could* take place in order to reduce noise to below the threshold limits. The recommended trigger thresholds are specified further above.

All the CAs that have implemented a NAP did so on the basis of existing SNMs. The trigger thresholds of the SNMs were used by many authorities as trigger mechanisms. For example, Brandenburg, Rhineland-Palatinate, Saxony and Saxony-Anhalt all developed their own trigger mechanisms.

The FluLärmG makes the noise limit values for the surrounding of airports contained in NAPs legally binding (Para. 14). According to this provision, noise action planning on aircraft noise must take into account noise limit values for protection zones as defined in para. 2 of the FluLärmG. The Law for the Improvement of the Protection from Aircraft Noise in Surrounding Areas (Gesetz zur Verbesserung des Schutzes vor Fluglärm in der Umgebung von Flugplätzen)[134] that came into force on 7th June 2007 contains related transitional provisions.

12.6.3 Measures

Noise protection measures included in the R2 NAPs by municipalities and the Federal States range from traffic planning, land-use planning, the selection of quiet sources, the reduction of noise transmission, technical measures at the noise source, economic measures, isolation, to the regulation and using stimulating measures. NAPs have also facilitated the imposition of speed limits on main roads, for example in Berlin.

[133] Noise Maps: http://cdr.eionet.europa.eu/de/eu/noise/df8/coluk47sq (as of 2012) and http://cdr.eionet.europa.eu/de/eu/noise/df8/colvi7k8q (as of update 2014)
Action Plans: http://cdr.eionet.europa.eu/de/eu/noise/df7/ (round 1) and http://cdr.eionet.europa.eu/de/eu/noise/df10/colvlp2wg/ (round 2)

[134] In: Bundesgesetzblatt vol. 2007 chapter 1, pp. 986 ff.

Substantive measures to mitigate noise have included the installation of sound-insulating windows, sound-insulating walls, speed limits and low noise surfacing on roads.

The key criteria for prioritising noise reducing measures are:

- The number of individuals exposed to noise
- Compatibility with related national laws on noise
- Implementation costs.

With regard to funding the implementation of the measures included in NAPs, the budget for the federal noise abatement programmes for existing federal highways was increased to € 50 million per year. The budget for existing railways of the federal railways was in 2014 raised to € 130 million per year. In the framework of the second stimulus package (Konjunkturpaket II), the Federal state provided € 3.5 billion in 2009 and 2010 from investments in infrastructure. This money could be invested in noise protection measures on municipal roads. For state roads the annual funding for preventative noise as well as noise remediation measures ranges from € 120 to 220 million per year.

In various regions, government grants and subsidies are tied to the existence of a NAP. In the Free State of Saxony more than € 15 million have been invested for measures for noise abatement at municipal roads where the harmful values of 65 dB (A) during the day or 55 dB (A) at night are exceeded. In addition to the replacement of noisy pavements by quieter road surfaces, the construction of noise barriers and the replacement of the existing pavement by open-void (low-noise) asphalt has been funded in pilot projects in Chemnitz and Dresden.

Financial support for municipalities is also available through state and federal funds such as:

- Federal redevelopment funds
- City traffic funds for municipal roads and promotion of public transport
- low interest funding for investments in improved transport infrastructure and noise protection measures.

The state North Rhine-Westphalia provides an online search tool for municipalities to identify applicable funding: *http://www.laermschutz.nrw.de/Foerderprogramme*.

12.6.4 Public consultations

Depending on the size of the municipality, public involvement was handled differently. Online publication is viewed as preferable given limited financial and human resources, especially in the municipalities. A comprehensive way of participating was to invite the residents and other interested parties to take part in action groups to make suggestions to the proposed NAP. Public involvement was initiated through:

- Online-participation
- Public gatherings or presentations
- Printed and online information material
- Publication in official journals
- Public city council and committee meetings
- Action days
- Idea competitions

In summary, the indefinite regulation on how to perform public consultation allowed the municipalities to adapt to their individual possibilities and situation.

12.6.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with any subsequent actions taken to address them, and new issues raised during R2.

Table 131 Noise action planning issues - Germany

R1	R2
The (too short) one-year interval between strategic noise mapping and noise action planning.	Considering the possibility to consign noise action planning to the Federal Railway Authority.
Delays in the provision of railway data.	Implementation of actions from the NAP is not regulated satisfactorily in the existing legislation. • No current obligation for noise remediation exists for existing roads and railways, therefore noise remediation is dependent on available budgetary resources. • Existing regulations direct toward emission thresholds and leave no scope for additional management measures. • The preconditions for noise protection through structural measures along state roads are due to high noise limits usually not met.
Lack of binding guidelines and noise limit values triggering NAPs.	Larger cities that had already experience from the previous round where able to resolve issues easier
Municipalities' lack of human resources and experience in carrying out noise action planning.	Responsible authorities still have only limited possibilities to develop measures for state roads, main railway lines and airports and define in an NAP.
Different authorities being responsible for Noise action planning and the implementation	Due to the lack of financing NAPs contain mainly traffic-related measures like tempo

R1	R2
of noise reduction method.	30, ban on heavy through traffic and improvement of traffic flow (e.g. NAP Berlin).
Lack of financing for implementation of NAPs. Lack of financial instruments to support noise reduction measures after phase-out of Germany's Stimulus Package II.	Lack of coordination between noise and air NAPs thus impeding the combination of both plans.
A lack of uniform calculation methods for traffic noise.	Measurements concerning airports could not be implemented in the actions plans due to missing options to restrict the approved operation of the airport.
Time allowed to prepare NAP after finalising them mapping too short.	
Protecting quiet areas.	

13. GREECE

13.1 National implementing legislation for END

The END was correctly transposed into Greek law by Ministerial Decision 13586/724 (Official Gazette 384/B/28.3.2006[135]) on Measures, Conditions and Methods for the Assessment and Management of Environmental Noise. This Decision was published in the Official Gazette after the deadline indicated in Article 14 of the END. Since then there have been two additional Ministerial Decisions. Ministerial Decision 211773/2012 (on the setting of indicators and maximum permitted levels of environmental noise from the operation of transportation projects, technical specifications for the acoustic studies for the calculation and installation of noise barriers, specifications for environmental noise monitoring programmes and other provisions[136]) replaced an earlier Ministerial Decision[137] addressing the same aspects and the earlier (1992) Ministerial Decision[138] applicable to that point.

Additional Greek legislation on environmental noise is shown in the table below.

Table 132 Key Legislation for the Abatement of Environmental Noise - Greece

Reference	Scope/Description
1178/81 - Off. Gaz. 291/A/5-10-81	Presidential Decree stipulating the measurement and control of noise emanating from airplanes
1650/86 - Off. Gaz. 150/A/16-10-86	Law for environmental protection - Article 14, Noise Prevention
3046/304 - Off. Gaz. 58/D/3-2-89	Urban Planning Decision - Building Code - Article 12 noise insulation noise prevention, auditory comfort Parameters - auditory comfort categories - noise insulation and prevention criteria
330/90 - Off. Gaz. 131/A/27-09-90	Presidential Decree on the transposition of EEC Directive 89/629/EEC on the limitation of noise emission from civil subsonic jet airplanes
17252/92 - Off. Gaz. 395/B/19-6-92	Decision of Ministry for the Environment, Physical Planning and Public Works on definition of indicators and maximum permissible noise limits emanating from road traffic and transport works
28340/2440/92 - Off. Gaz. 532/B/18-8-92	Joint Ministerial Decision on prevention of noise pollution from motorcycles, in compliance with Directives 78/1015/EEC, 87/56/EEC and 89/235/EEC. Acceptable noise levels, EU-type approvals, measurement patterns, etc.
19567/1725 - Off. Gaz. 442/B/ 18-06-93	Ministerial Decision on noise from motorcycles (noise levels and exhausts)
25006/2234 - Off. Gaz.	Joint Ministerial Decision about the acceptable noise level of vehicles - compliance with provisions of 92/97/EEC - Article 2: from

[135] Υ.Α. 13586/724/2006 (ΦΕΚ 384/Β`/28.3.2006) Καθορισμός μέτρων, όρων και μεθόδων για την αξιολόγηση και τη διαχείριση του θορύβου στο περιβάλλον, σε συμμόρφωση με τις διατάξεις της οδηγίας 2002/49/ΕΚ «σχετικά με την αξιολόγηση και τη διαχείριση του περιβαλλοντικού θορύβου» του Συμβουλίου της 25-6-2002.

[136] Υ.Α. οικ. 211773/2012 - Καθορισμός δεικτών αξιολόγησης και ανώτατων επιτρεπόμενων ορίων δεικτών περιβαλλοντικού θορύβου που προέρχεται από τη λειτουργία συγκοινωνιακών έργων, τεχνικές προδιαγραφές ειδικών ακουστικών μελετών υπολογισμού και εφαρμογής (ΕΑΜΥΕ) αντιθορυβικών πετασμάτων, προδιαγραφές προγραμμάτων παρακολούθησης περιβαλλοντικού θορύβου και άλλες διατάξεις

[137] Υ.Α. οικ. 210474/2012 (ΦΕΚ 204/Β`/9.2.2012) Καθορισμός δεικτών αξιολόγησης και ανώτατων επιτρεπόμενων ορίων δεικτών περιβαλλοντικού θορύβου που προέρχεται από τη λειτουργία συγκοινωνιακών έργων (σύμφωνα με την οδηγία 2002/49/ΕΚ)

[138] Υ.Α. οικοθεν 17252/1992 (ΦΕΚ 395/Β`/19.6.1992) Καθορισμός δεικτών και ανωτάτων επιτρεπομένων ορίων θορύβου που προέρχεται από την κυκλοφορία σε οδικά και συγκοινωνιακά έργα

Reference	Scope/Description
523/B/13-7-93	1.10.96 prohibition of traffic) - Reformation of the Decision G20/81567/898/1988 Off. Gaz. 403B
3/96 - Off. Gaz. 15/B/12-1-96	Police Ordinance about the observance of public tranquillity
29087/2295 - Off. Gaz. 79/B/7-2-97	Modification of the Joint Ministerial Decision 25006/2234 - Off. Gaz. 523/B/97 about acceptable noise levels on cars - compliance with provisions of 70/157/EEC about rapprochement of the legislation of Member States
34245/2779 - Off. Gaz. 1050/B/ 27-11-97	Ministerial Decision on adaptation of Greek law to Directive 96/20/EC adapting to technical progress Council Directive 70/157/EEC relating to the permissible sound level and the exhaust system of motor vehicles
2696/99 - Off. Gaz. 57/A	Law on the introduction of Greek Highway Code (Article 15 on pollutants, noise, etc.)
7034/1298 - Off. Gaz. 368/B/24-3-2000	Joint Ministerial Decision about the minimum distances of recreational activities
211773/2012 – Official Gaz. 367/B`/27.4.2012	Ministerial Decision setting indicators and maximum permitted levels of environmental noise from the operation of transportation projects, technical specifications for the acoustic studies for the calculation and installation of noise barriers, specifications for environmental noise monitoring programs and other provisions

Source: www.minenv.gr/1/12/122/12202/e1220212.htm and www.elinyae.gr/el/keywords.jsp?keyword=1946

13.1.1 Legal implementation

The Ministry of Reconstruction of Production, Environment and Energy, Directorate for Climate Change and Atmospheric Quality is responsible for environmental noise.

According to Article 4 of the 2006 Ministerial Decision, for the purposes of the implementation of the Decision, a five-strong Technical Inter-Ministerial Working Group (TIWG) was set up, and tasked with:

- Developing recommendations and delegating responsibility for strategic noise mapping and noise action planning to the Directorate of Atmospheric Pollution and Noise
- Submitting opinions on any issue arising in the process of implementing the 2006 Ministerial Decision
- Providing the necessary technical support on issue of collaboration with other EU Member States and third parties[139].

However, the TIWG convened only once. In practice, the implementation of the Directive has been the responsibility of the Unit responsible for Noise, Vibrations and Radiation within the Ministry (1 full-time employee), supported by external consultants (private and academic, including the Laboratory of Transportation Environmental Acoustics (L.T.E.A.) of the University of Thessaly) that have been responsible for the various strategic noise mapping and actions plan studies.

[139]Greek Ministry of Environment, Physical Planning & Public Works (2006): Press Release 27 February 2006, http://www.minenv.gr/download/2006-02-27.odigia.2002.49.gia.perivalontiko.thorivo.doc (accessed on 17 June 2009).

13.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Greece included 2 agglomerations, 1 airport, and approximately 75 km of major roads. The introduction of definitive thresholds in R2 led to the inclusion of 13 *additional* urban agglomerations within the scope of the END[140]. There was again 1 major airport during R2, around 50km of urban and interurban railway in Athens and Thessaloniki and 135 km of major roads. It should be noted that as part of the agglomerations of Heraklion (Crete) and Corfu, there were also targeted studies made for the respective international airports which represent the main source of environmental noise.

Table 133 END coverage – Greece

Round	Agglomerations	Major airports	Major rail	Major roads
1	2	1	6 km	75 km
2	13[141]	1	50 km[142]	135 km[143]

13.2 Competent Authorities and designated administrative bodies

The Noise, Vibration & Radiation Department at the Ministry of Environment & Energy is the Competent Authority.

13.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

13.3.1 Data collection

There was sufficient data for the designation and delimitation of sites for reporting in 2005 (although communication of these to the Commission was late).

In R2, out of a total of 1,034 municipalities, Greece has only two agglomerations with populations greater than 250,000, and six with populations greater than 100,000. However, some additional agglomerations that were below the limits were also included and consequently the total of agglomerations covered is 13.

13.3.2 Implementation issues

Table 134 Designation issues

R1	R2
A lack of digital maps Low prioritisation of environmental noise Lack of expertise among the relevant authorities with regard to strategic noise mapping, noise mitigation and management. Uploading of data onto the CIRCA web	Digital maps have been fully developed as part of R2 making use of maps from the cadastre. Environmental noise issues are considered a priority although this was not the case in relation to the two most important infrastructures (Athens Airport and Attiki Highway).

[140] The respective studies for some of these agglomerations have yet to be finalized or approved.

[141] Attiki region (broken down to 6 agglomerations), Thessaloniki (2 agglomerations), Neapoli, Giannena, Kavala, Patras, Volos, Larisa, Heraklion, Chania, Ioannina, Corfu, Agrinio, Serres

[142] Covered by Athens and Thessaloniki agglomerations

[143] Attiki highway (75km), Egnatia odos (40 km)

R1	R2
space	Expertise in strategic noise mapping, mitigation and management remains rather limited. There is essentially one laboratory with relevant capacity and expertise and only a few civil servants with relevant experience. There have been delays in the uploading of relevant data onto CIRCA web space even though the Greek authorities have already submitted the relevant files to the EIONET.

13.4 Noise limits and targets

13.4.1 Objectives and Scope

There are mandatory noise limit values in Greece which are set out in the Ministerial Decision 211773/2012.

13.4.2 Noise limit values

General noise limits in Greek law are linked to land use and established under Presidential Decree 1180/81 (Off. Gaz 293/A/6-10-1981).

Table 135 Noise limits – Greece

Area type	Noise limit - dB(A)
Industrial as determined by legislation	70
Predominantly industrial	65
Industrial and urban co-existence	55
Urban	50
Installations adjacent to inhabited dwellings, irrespective of area characterisation	45 (measured inside the dwelling with open door and windows)

Source: http://www.minenv.gr/4/ypexode4/pd%201180/81.htm

Traffic noise indicators under the Ministerial Decision 211773/2012, are:

- L_{den} (24 h)
- L_{night} (8 h)

As noise limits for these indicators, the following are set at 2 metres from the building façade:

- For L_{den} (24 h): 70 dB (A),
- L_{night} (8 h): 60 dB (A)

These limits are applicable for all inhabited areas where there are established planning limits and regulations. In the case of sensitive areas (including hospitals, schools, culture centres, etc.) the limits for a specific transport infrastructure may be further reduced by up to 5 dB (A), in accordance with the Ministerial Decision.

The specific limits apply to all types of traffic noise. There are no specific limits for aircraft noise. While not defined in any relevant piece of legislation, standard criteria for tramway noise and vibration are generally used in practice:

- 40dB(A) maximum permissible ground borne noise level from train operation inside dwellings (in the frequency area of 10 to 200Hz); and
- 35dB(A) maximum permissible ground borne noise level from train operation inside sensitive buildings (e.g. theatres) (in the frequency area of 10 to 200Hz)[144].

13.4.3 Methods for establishing noise limit values

According to Ministerial Decision 13586/724/2006 transposing the END, the methods for establishing noise limits values for road and rail traffic are:

- For road traffic, the French traffic noise prediction methodology «NMPB−Routes−96 (SETRA− CERTU−LCPC−CSTB) », (Guide de Bruit); and
- For rail traffic, the Netherlands noise prediction methodology as published in Reken−en Meetvoorschrift Railverkeerslawaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996», or alternatively the «Guide du bruit des transports terrestres, fascicule prevision des niveaux sonores, CETUR 1980».

There is no methodology specified in relation to air traffic but the methodology described in ECAC.CEAC Doc. 29 "Report on Standard Method of Computing Noise Contours around Civil Airports", 1997 is the one that has been followed in all relevant studies.

Health-based assessments are not used for setting out noise limits values.

13.4.4 Noise monitoring systems

According to the Ministerial Decision 211773/2012, for all major transport infrastructure projects a noise monitoring programme needs to be developed establishing fixed and mobile locations for the measurement of environmental noise close to residential and other sensitive areas together with a programme of hourly measurements.

Indicators used for permanent noise monitoring systems are L_{den} and L_{night}.

Environmental noise measurements systems are in operation in the case of two major highways, Attiki odos and Egnatia odos.

In the case of Attiki odos, eight automatic noise measuring stations are in operation for continuous monitoring of the level of noise. In 2011 the noise measurement infrastructure was updated on the basis of a study of the LEAT laboratory aiming to monitor noise in real time. 150-200 24-hour measurements annually with mobile noise measurement units were also made which led to the establishment of additional noise barriers, increasing them to over 100m[2145].

In the case of Egnatia, noise measurements are systematically undertaken in accordance with the Directive and the transposing Greek law. Measurements started in 2007. The latest measurements were taken in 2013 in residential areas located in a

[144] Vogiatzis K (2009): Πολιτικές Μείωσης & Προστασίας από τον Περιβαλλοντικό Θόρυβο - Θεσμικά & Τεχνικά Εργαλεία, http://ecocity.gr/uploaded/files/Kostas_Vogiatzis.pdf (accessed on 18 June 2009).

[145] http://www.aodos.gr/summary.asp?catid=19617&subid=2&pubid=11246982

zone of 200 metres from the nearest road. This included 66 villages, and a total of 153 data points along the whole of the Egnatia highway. The monitoring over 24 hours involved a measuring height of 4.0 metres; as well as 15-minute, 30-minute and hourly decibel measurements with a measuring height of 2.5 to 3 metres[146].

According to the results of the measurements, for the largest percentage of settlements on either side of the Egnatia, the noise level is below the statutory limits L_{den} (70 dB(A)) and L_{night} (60 dB(A)). There were 15 locations were the limits were exceeded (6 in the case of L_{den} and 9 for L_{night}) all around the Thessaloniki agglomeration. However, in these locations there are no residential areas affected (only industrial uses) and, as a result, the total share of the population affected along the whole highway is 0%.

This is a significant improvement from the 2010[147] measurements which found that a small part of the population in certain locations (such as in the village of Vrasna) was subject to noise above the then applicable limits[148] [149], upon which noise-barriers were installed.

Finally, measurements made in the proximity of the fence of Egnatia showed noise levels exceeding the limits and reaching up to the 72.0 dB(A) for the L_{night} indicator and 80.8 dB (A) for the L_{den} indicator. The company has argued that the spatial expansion of residential areas towards the motorway needs to be curbed[150].

13.5 Quiet areas

13.5.1 Overview

L_{den} is the criterion to be used for delimitation of quiet areas both within and outside agglomerations.

Delimitation

So far, no quiet areas have been established although all SNMs completed so far have made proposals for quiet areas. During R1 there had been proposals for quiet areas in Athens as part of the Rethink Project[151] and there have been further proposals as part of R2. However, very limited progress has been made with regard to the adoption of the relevant measures since most of the studies have only recently been adopted.

Protection

In the case of sensitive areas, the Ministerial Decree provides that the noise limits may be up to 5 dB (A) lower than the generally applicable L_{den} and L_{night} limits.

The NAPs make proposals for specific measures to be taken (such as no traffic zones). However, these have so far not been taken up in practice.

Agglomerations

[146] Egnatia (2004): ENV01: Έκθεση Πληθυσμού σε Θόρυβο, http://observatory.egnatia.gr/factsheets/fs_2014/ENV01_factsheet_2014.pdf

[147] http://observatory.egnatia.gr/factsheets/fs_2011/ENV01_factsheet_2011.pdf

[148] L10 (18h): 70db (A), Leq (8-20 h): 67 dB(A)

[149] In relation to the L_{den} and L_{night} indicators, the share of the population exposed was 0.9%

[150] Ibid

[151] http://www.rethinkathens.org/eng/project

A series of quiet areas have been identified in the SNMs and the relevant measures are pending.

Open country

No quiet areas in open country have been identified.

13.5.2 Implementation issues

Actions plan proposals for quiet areas have yet to be implemented since most of the studies were only recently formally completed and some are still pending.

13.6 Strategic noise mapping

13.6.1 Overview

Table 136 SNMs Greece

	R1	R2
Agglomerations	0 (2)	17*
Major airports	1	1
Major railways	6 km	(50 km)
Major roads	1	2 (135 km)

** covering 13 agglomerations*

13.6.2 Data collection

Prior to the END, the Ministry of the Environment prepared SNMs for all cities in Greece with a population of more than 50,000[152]. For Athens, information from the early 2000s suggests a SNM had been prepared every 10 years: in 1977, 1987 and 1997. A 2007 map was not prepared. SNMs produced prior to the introduction of the END were based on data and information provided by the Greek National Statistical Census Bureau (on, for example, building block maps, the number of residents per building block, etc.) and parameters such as L_{max}, L1, L10, L50, L90, L95 and L_{eq}. L_{den} and L_{night} measurements as required under the END were not undertaken and therefore the SNMs prepared as part of R1 (2006) were developed using different measurement tools.

It should also be noted that Attiki odos and the Athens international airport have established their own noise monitoring systems and submit annual reports to the ministries.

For R2, SNMs based on L_{den} and L_{night} measurements have already been completed for five agglomerations[153], with 14 more at different stages of implementation. There are also SNMs for the two main highways (Attiki and Egnatia odos) and the Athens International airport.

The main guidance documents that were used in the implementation of the Environmental Noise Directive in Greece are the EEA's "2007 Good Practice Guide for

[152] Thirty-three noise maps for Athens, Holargos, Papagos, Kallithea, Ilion, Peristeri, Nea Smyrni, Nea Philadelphia, Aegaleo, Halandri, Ilioupolis, Korydallos, Thessaloniki, Patras, Piraeus, Volos, Kavala, Rhodes, Ioannina, Larissa, Heraklion, Trikala, Serres, Lamia, Chania, Chalkis, Kalamata, Katerini, Veria, Alexandroupolis, Agrinio, Kerkyra (Corfu), Ptolemais.

[153] Attiki region (split in 5 agglomerations), Thessaloniki, Kalamaria, Giannena, Kavala, Volos, Larsia, Heraklion, Hania, Corfu, Agrinio, Serres

Strategic noise mapping and the Production of Associated Data on Noise Exposure" and the document on "Presenting Strategic noise mapping Information to the Public".

The SNMs were developed on the basis of a multidisciplinary methodology taking into account simultaneously real time acoustic measurements, software prediction results and feedback from an interview programme with inhabitants on the theme of acoustic comfort and sonic identities. SNMs were produced using acoustic prediction software and using detailed 3D models. In parallel, a full 24 h noise measurements monitoring program was executed. Finally, interviews with residents covered aspects of the overall acoustic environment, assessment of the sound environment, identification of main sound sources, identification of representative sounds for the specific district. The interviews were used to develop sound identity maps.

Guidelines on carrying out strategic noise mapping have been set at national level. The main noise indicators used were L_{den} and L_{night}, and no supplementary indicators have been used from the national level.

For the agglomeration and the major highways, the mapping methods followed were the national French method "NMPB-Routes-96 (SETRA-CERTU-LCPCCSTB)", as it is presented in the "Article du 5 mai 1995 relatif au bruit des infrastructures routières, Journal O-ciel du 10 mai 1995, Article 6" and in the French standard "XPS 31-133".

When relevant, aircraft noise was taken into consideration using the methodology "ECAC.CEAC Doc. 29 / Report on Standard Method of Computing Noise Contours around Civil Airports, 1997". The same method was also used in the case of the Athens "Eleftherios Venizelos" airport[154] for the 2006 and 2011 SNMs.

The analysis of air traffic was based on the airports' annual air traffic and flight track data for the most recent years. The receptor height was determined at 4 metres. Results were presented in maps and tables/diagrams showing the indicators L_{den} and L_{night} as defined in Annex I of JMD 13586/724 in scales of 5 dB. A complete evaluation of results was made as far as the calculation of area/land uses and numbers of individuals who live in residences inside municipal blocks exposed in various levels of noise are concerned, as it is determined in Annex VI of the Directive, while a special study was made for all the recorded sensitive receptors.

The population data used in strategic noise mapping was based on official results of the 2001 census (data from the 2011 census was not available at the time of the study) per block of residences at settlement level of all municipalities and communities of the study area[155].

The **responsibility for overall data collection** lies with the national authorities (Ministry of Environment – Directorate for Climate Change and Quality of Environment). The Ministry issued a number of calls for the development of the various SNMs.

13.6.3 Strategic noise mapping methods

Data for the SNMs have been developed on the basis of extensive 24h noise measurement programme making use of specially designed masts and covering various sources of environmental noise. These were also compared with acoustic models and in all cases a high level of correlation was found.

[154] TT&E Consultants, 2007, "Athens International Airport "Eleftherios Venizelos," Draft Study on Aircraft Noise, Strategic Noise Map 2006, June 2007 (available from the CIRCA website).

[155] Ibid.

For the development of R2 SNMs, geographical information system based on the national cadastre and the geographic data base of the Hellenic Statistical Authority in combination with population census data to measure the affected population.

In general, the quality of the data from the R2 studies is considered as particularly high.

13.6.4 Public accessibility of SNMs

The findings from environmental strategic noise mapping but also social surveys related to noise levels and impacts have been included in the relevant studies and presented to the Ministry of Environment and to all affected local authorities for open discussion with public participation. The maps for some of these studies have been made available in electronic format and on the Ministry's website[156]. There is also a production of actual colour SNMs in paper (size about 27x39 cm) in scale 1:5000 or 1:10000. The maps are also available free of charge to administrations and the general public.

The website of the Ministry of Environment provides access to the initial SNMs for Egnatia and Attiki odos. The SNMs developed as part of R2 are expected to be made available through the website in the coming period.

In case of the Athens airport, information concerning noise and measurement results is given to the local community through the annual publication of A.I.A.'s Environmental Services Department entitled "Care for the Environment"[157].

13.6.5 Implementation issues

One key implementation issue during R1 was the absence of digitised maps for agglomerations. For R2 studies the digital maps from the national cadastre and the Hellenic Statistical Authority were used. The main issue has been the delays for the completion of the relevant studies due to budget cuts and bureaucratic procedures.

13.7 Noise action planning

13.7.1 Overview

The table below provides an overview of the NAPs produced in Greece in Round 1 and 2.

Table 137 NAPs – Greece

	R1	R2
Agglomerations	0 (2)	17 (13 agglomerations)
Major airports	1	1
Major railways	no data	no data
Major roads	1	2

[156] http://www.ypeka.gr/Default.aspx?tabid=452&language=el-GR

[157] http://www.aia.gr/company-and-business/the-company/Corporate-Publications/enviroment

13.7.2 Methodologies for noise action planning

In the past, NAPs have been developed on the basis of earlier impact assessments carried out in respect of major transport infrastructure upgrade developments (airports/ major rail/major roads), although no such previous studies were available for agglomerations). Moreover, in instances where local authorities had sought to develop new environmental noise management initiatives, the Ministry of Environment has generally been keen to support them.

As part of R2, NAPs were developed in tandem with the SNMs for all agglomerations, the Athens international airport and the two main highways.

During R1, a key problem was that there were no national guidelines and a further issue was the lack of digitisation of the necessary information. Such issues have already been addressed, as indicated further above.

13.7.3 Measures

During R1, there were some delays in noise action planning, but a number of different types of measures were identified as possibly relevant. These include:

- Technical measures at noise source;
- Noise insulation;
- Changes towards the use of sources producing less noise
- Regulation.

The Directive requires evidence that the responsible authorities have developed appropriate selection criteria in order to prioritise noise reduction and mitigation measures in order of importance.

In R1, these included the level of population exposure (i.e. environmental noise affecting more people), the costs and ease of implementation.

In case of Attiki odos, the proposed NAP included the installation of additional noise barriers[158] in certain locations. A noise monitoring system was already in place since 2002. The study also proposed the partial coverage of the highway in two specific locations, expected to bring significant reduction to the level of noise. However, to date, this proposal has not been implemented, possibly due to reductions to the level of traffic as a result of the financial crisis. In case of Egnatia odos no specific measures were considered necessary on the basis of the SNMs[159].

In total there were 67,000 m^2 of anti-noise barriers in place[160] along Attiki Odos and around 70,000m^2 more distributed across locations where highways are in proximity

158 Τεχνική έκθεση: Σχέδια δράσης Αττικής Οδού - δείκτες L_{den} & L_{night}» σύμφωνα με την Ευρωπαϊκή Οδηγία 2002/49/ΕΚ &την ΚΥΑ 13586/724/ΦΕΚ Β' 384/28.3.2006, http://www.ypeka.gr/LinkClick.aspx?fileticket=3Un5fGAEep4%3d&tabid=452

159 ΧΑΡΤΟΓΡΑΦΗΣΗ ΤΟΥ ΘΟΡΥΒΟΥ ΣΤΑ ΤΜΗΜΑΤΑ ΤΗΣ ΕΓΝΑΤΙΑΣ ΟΔΟΥ ΑΠΟ Α/Κ ΒΕΡΟΙΑΣ ΕΩΣ Α/Κ Κ1 ΚΑΙ ΑΠΟ Α/Κ ΓΗΡΟΚΟΜΕΙΟΥ ΕΩΣ Α/Κ ΣΤΡΥΜΟΝΑ - ΤΕΛΙΚΗ ΤΕΧΝΙΚΗ ΕΚΘΕΣΗ http://www.ypeka.gr/LinkClick.aspx?fileticket=0kV%2bNtI9flQ%3d&tabid=452&language=el-GR

160 Vogiatzis K (2007): Monitoring of Environmental Noise & Noise Abatement Measures, The GR experience: Attiki Odos & Athens Tram, 23 November 2007, Nicosia – Cyprus, http://www.cyprus.gov.cy/moa/agriculture.nsf/All/CDE98DCFC8F1BCC9C225739E0069A387/$file/Monitoring%20of%20Environmental%20Noise-%20811%20KB.pdf?OpenElement (accessed on 17 June 2009).

to residential or sensitive areas. It is estimated[161] that in 2015 the anti-noise barriers along Attiki Odos had increased to over 100m^2 with additional barriers built along certain parts of Egnatia Odos and other major motorways. In total, there are probably more than 200m^2 anti-noise barriers established.

[161] Interview with Konstantinos Vogiatzis, Laboratory of Environmental Transportation Acoustics (L.T.E.A.) of the Dept. of Civil Eng. of the University of Thessaly

The box below represents a case study of measures detailed in the NAP for Athens airport.

In relation to Athens airport, the noise abatement procedures were established before the commencement of the operation of the airport in cooperation with the Hellenic Civil Aviation Authority (HCAA) and included:

- Avoidance of the use of the east runway 03R for departures, for an eight-hour period during the night (23.00-07.00). Exceptions are allowed in case of operational restrictions (e.g. Maintenance works or other kind of works), in case of increased traffic and extremely bad weather conditions;
- Implementation of measures for noise reduction during aircraft landing (use of gear, flaps and power) according to the relevant safety procedures;
- For departing aircraft, speed, use of power and flaps according to the procedures of the ICAO for noise reduction; and
- Take-offs from the east 03R runway as well as landings to the east 21R runway are avoided and for the time period from 15:00 until 18:00, by issuing a temporary NOTAM which is being renewed until today after the expiration of its implementation period.[162]

The Athens airport is operating a permanent Noise Monitoring System (NOMOS). NOMOS is used for monitoring noise levels in the broader area of the airport as well as the automatic correlation of noise levels with specific aircraft movements. This system is composed from a network of ten (10) permanent Noise Monitoring Terminals (NMTs), one mobile station and a central unit with software for the collection, procession and storage of data. It also includes connection with the Hellenic Civil Aviation Authority's radar in order to obtain flight path data, the Airport Operation Data Base (AODB) in order to receive flight plan data, as well as connection with the Air Quality Monitoring Network for the provision of weather data. The automatic correlation of noise levels with specific aircraft movements is performed based on the minimum distance of the aircraft flight path from each NMT. The measurement data is used to assess the impact of aircraft movements on the noise levels in the vicinity of the airport, monitoring the compliance with the Noise Abatement Procedures, the investigation of complaints from the public and general planning purposes. NOMOS uses a large number of indices for the description of the acoustic environment[163].

A 2009 publication by the airport company[164] provided average noise levels for L_{den} and L_{night} for all nine monitoring stations operated by the company with highest average levels shown for the Koropi locality with L_{den} around 67-68 dB and L_{night} around 60-61 dB.

[162] TT&E Consultants (2007): Athens International Airport "Eleftherios Venizelos", Draft Study on Aircraft Noise, Strategic Noise Map 2006, June 2007

[163] Ibid

[164] AIA (2009): Noise, available from the Athens International Airport Internet site http://www.aia.gr/UserFiles/File/Environment/2009_updates/164700_noise.pdf (accessed on 31 July 2009).

With regard to noise mitigation planning for buildings, City Planning Decision 3046/304 (Official Gazette 59/D/3 February 1989) lays down the parameters of the "acoustic comfort" along with a description of the necessary measures for sound insulation in buildings according to specific uses (i.e. schools, hospitals, residential buildings etc.). All new buildings in Greece should comply with the relevant specifications (i.e. noise insulation of a house from outdoor traffic noise is expressed as L_{eq} hr which should not be more than 35 dB(A) etc.).

Regarding R2 studies, information is only partially available. In the case of Athens International airport[165], the 2011 SNM found an overall reduction of the noise levels in comparison to 2006 for all affected areas. There is no part of the population exposed to noise levels above 65 dB (A) for L_{den} and 55 dB (A) for L_{night}. The existing NAP was considered effective and no additional measures were implemented. The most recent Care for the Environment publication (2014) reports that there is no municipality around the airport where L_{den} exceeds 60db (A) and Light 50 dB (A)[166]. The fact that, according to the most recent report submitted by the Airport authority, only one noise-related complaint was in March 2015, provides further evidence of the reduced impact of the airport on the surrounding area.

In contrast, in the case of Heraklion airport[167] the proposed NAP includes as a key action the relocation of the airport in a low density urban agglomeration 25km from Heraklion (Kastelli). The airport relocation – which is already in the tender process and has been decided on the basis that the current airport has exceeded its capacity –is expected to lead to significant reduction of the noise levels below the relevant limits for the Allikarnassos area that is currently affected by the air traffic noise.

The plan included:

- Construction of noise barriers
- Traffic flow management measures
- Widening of sidewalks and allowing parking only on one side of the road
- To introduce pedestrian axes, particularly around education buildings and public services (town hall, social security building, churches, etc.)
- Promote the building of small buildings opened on the back façade in the aims to create islands of tranquillity.

The NAP also includes a proposal for management of activities on the area ensuring land use mixture and the creation of sound aesthetic dimensions in order to promote soundscape listening.

13.7.4 Public consultations

Public consultation plans were already obligatory pre-END in Greece in relation to the planning stage of major infrastructure development.

[165] Konstantinos Vogiatzis (2014), Assessment of environmental noise due to aircraft operation at the Athens International Airport according to the 2002/49/EC Directive and the new Greek national legislation, Applied Acoustics 84 (2014) 37–46

[166] http://www.aia.gr/ebooks/ENC/carefortheenvironment/issue16/index.html#p=10

[167] Konstantinos Vogiatzis and Nicolas Remy (2014), Strategic Noise Mapping of Heraklion: The Aircraft Noise Impact as a factor of the Int. Airport relocation, Noise Mapp. 2014; 1:15–31

As part of efforts to engage in public consultation "Eleftherios Venizelos" airport in Athens has set up a special telephone communication line "*Sas akoume*" (We Listen), where citizens can call for information and report noise-related complaints and issues. The telephone line operates on a 24hr basis.

Reports based on the results of the implementation of the NAP are submitted to the relevant authorities (e.g. Ministry of the Environment, Hellenic Civil Aviation Authority) on a monthly and a six-monthly basis. Furthermore, information about noise as well as measurement results is given to the local community through the publication "Care for the environment" which is published by the airport company. This publication is published annually and includes data about various environmental parameters and activities of the Environmental Services Department of the airport[168].

However, there have been complaints with regard to public participation in the development of the NAP for the Athens airport. In March 2009, the East Attica Prefecture within which the airport is located sent comments to the Ministry of Environment, Physical Planning & Public Works indicating that they were only advised of the NAP being developed from an announcement on the Ministry Internet site[169]. The Prefecture argued that there had been no consultation of stakeholders (local residents and local authorities) in the process of developing the SNM and NAP.

Such consultations took place as part of R2. There were two meetings organised for each of the studies, one for the presentation of the strategic maps and the send for the presentation of the NAPs. There were also informal discussions with the technical services of the municipal authorities. According to the Ministry representative, the authorities have been fully involved in all stages of the process.

13.7.5 Implementation issues

Due to the delays in the formal completion of some of the studies the implementation of R2 NAPs has also been delayed.

[168]TT&E Consultants (2007): Athens International Airport "Eleftherios Venizelos", Draft Study on Aircraft Noise, Strategic Noise Map 2006, June 2007 (available from the CIRCA website).

[169] See announcement of the Prefecture available here:

http://www.atticaeast.gr/index.php?option=com_content&task=view&id=1840&Itemid=340 (in Greek).

14. HUNGARY

14.1 National implementing legislation for END

14.1.1 Legal implementation

The END has been transposed into national legislation in Hungary[170] through two main decrees. These are:

- Governmental Decree 280/2004 (X.20) on the Assessment and Management of Environmental Noise[171] ;
- Decree 25/2004 of the Ministry of the Environment and Water on Detailed Requirements of Strategic noise mapping and Noise action planning[172] .

Government Decree No. 280/2004 (X.20) sets out noise limits, and includes the delimitation methods for quiet areas and arrangements for producing NAPs.

Decree No. 25/2004 (XII. 20) relates to the required form and content of SNMs used for the evaluation and management of environmental noise, and the calculation and testing methods used for the preparation of SNMs.

There are a number of other documents relating to Hungarian legislation that deal with environmental effects of noise. These are as follows:

- Government Decree 284/2007 (X.29.) on certain rules relating to protection from environmental noise and vibration;
- Joint Decree of the Ministry of the Environment and Water and of the Ministry of Health 27/2008. (XII. 3.) on the Establishment of Noise and Vibration Limits.

14.1.2 Scope of END implementation – Rounds 1 & 2

In Hungary in R1,[173] the scope of strategic noise mapping and noise action planning included one agglomeration, one airport and approximately 539 km of major roads and 32 km of railway. The introduction of definitive thresholds in R2 led to an extension of the scope to include nine agglomerations, and approximately 958 km of major railway lines and 3370 km of major roads.[174] All the obligatory R2 strategic noise mapping data is available online[175].

[170] In order to avoid duplicating requirements Hungary has modified the national legislation in 2007.

[171] relates to noise limits, and includes the delimitation methods for quiet areas and action plans. Available in Hungarian at http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A0400280.KOR

[172] relates to the required form and content of strategic noise maps used for the evaluation and management of environmental noise, and the calculation and testing methods used for the preparation of strategic noise maps. The decree is an amendment to the Environmental Protection Act, LIII/1995, available in Hungarian http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A0400025.KVV

[173] Information available at: http://www.kvvm.hu/cimg/documents/05_23_miniszteri_kozlemeny.pdf

[174]Information available at: http://www.kormany.hu/hu/foldmuvelesugyi-miniszterium/kornyezetugyert-agrarfejlesztesert-es-hungarikumokert-felelos-allamtitkarsag/hirek/strategiai-zajterkepek

[175]Information available at: http://www.kormany.hu/hu/foldmuvelesugyi-miniszterium/kornyezetugyert-agrarfejlesztesert-es-hungarikumokert-felelos-allamtitkarsag/hirek/strategiai-zajterkepek

Table 138 END coverage – Hungary

Round	Agglomerations	Major airports	Major rail	Major roads
1	1[176]	1[177]	25 km	539 km
2[178]	9[179]	1[180]	914** km	2,903*** km

** The Budapest agglomeration consists of the capital and its outskirts (22 separate municipalities in total). In the 1st round of strategic noise mapping, Budapest and 21 lesser municipalities formed an association and made one common SNM which covered the whole of the Budapest agglomeration. In R2, all 22 municipalities in the Budapest Agglomeration had to prepare an individual SNM but in order to avoid further delay in data reporting caused by the incompleteness of data, the Hungarian authorities gave them separate Unique Agglomeration ID-s.*

*** 28 SNMs for all major roads (914,1km): M0, M1 motorway and a main road, M2 motorway, M3 motorway, M5 motorway, M6, M7 highway, M30 motorway and main road, M43 motorway, Baranja County, Kiskun County, Bekes County, Zemplén County, Budapest and Pest county, Csongrad County, Fejér, Gyor-Moson-Sopron county, Hajdu-Bihar County, Heves county, Jasz-Nagykun-Szolnok County, Komárom-Esztergom county, Nograd county, Somogy County, Bereg County, Tolna County, Vas, Veszprem County, Zala county*

**** 9 SNMs for all major roads (2902.871km): No. 1 line Budapest - Hegyeshalom, No. 30 line Budapest - Székesfehérvár, No. 40 line Budapest - Pusztaszabolcs, No. 70 line Budapest - Vac, No. 80 line Budapest - Mezőzombor, No 100 line Budapest - Nyíregyháza, No. 120 line Budapest - Szolnok, No. 140 line Szeged director - Szeged, No. 150 line Budapest, Ferencvaros - Budapest Soroksári.*

14.2 Competent Authorities and designated administrative bodies

According to Governmental Decree 280/2004 (X.20) on the Assessment and Management of Environmental Noise, the Ministry of Environment and Water was responsible for Round 1 mapping. However, responsibility for noise mapping in Round 2 was reallocated to the Ministry of Agriculture. The Ministry of Agriculture is also responsible for the collection and reporting of data related to SNMs and NAPs to the European Commission/ EEA and actively implicated in legislation-making. According to this law, other responsible bodies include:

Table 139 Administrative Responsibility for the END - Hungary

Role	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities	Road administrations	Railway administrations	Airport administration
Collecting and approving SNMs	Environmental Authority	Ministry of Transport, Ministry of Agriculture	Ministry of Transport, Ministry of Agriculture	Ministry of Transport, Ministry of Agriculture
Preparing NAPs	Municipalities	Road railway administrations	Railway administrations	Company which administrate the main airport or the city airport

[176] Budapest

[177] Budapest Ferihegy International Airport

[178] Information available at: http://www.kozlonyok.hu/kozlonyok/Kozlonyok/31/PDF/2008/13.pdf

[179] Budapest, Debrecen, Gyor, Kecskemét, Miskolc. Nyíregyháza, Pécs. Szeged, Nyíregyháza

[180] Budapest Ferihegy International Airport

Role	Agglomerations	Roads	Railways	Airports
Information of the public	Municipalities	Road administrations	Railway administrations	Airport administration
Participation of the public	Municipalities			
Approving NAPs	NAP proposals are transmitted to competent public health authority, transport authority, municipalities in the county. These organizations comment on the proposal			
	Municipalities	Ministry of Transport	Ministry of Transport	Ministry of Transport
Collecting NAPs	The Ministry of Agriculture			
EC/EEA reporting	The Ministry of Agriculture is responsible for sending data to the European Commission			

14.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

14.3.1 Data collection

On the 6th March 2009[181], Hungary reported to EIONET Central Data Repository for the EC for the whole of 2008: one "major" airport (Budapest Ferihegy International Airport[182]), nine agglomerations over 100,000 inhabitants and one over 250,000 (Budapest), 78 "major" railways and 647 "major" road sections. The number of major roads sections was modified by the decree 8003/2008 (HÉ 46) of Ministry of Transport, Telecommunication and Energy (KHEM) [5].

The Law on Noise Management in Hungary transposes the END's definitions of agglomerations, major roads, major railways and major airports. Agglomeration borders are aligned with the administrative borders of cities with more than 100,000 inhabitants. The number of inhabitants for each city is publicly available from the Hungarian Central Statistical Office[183].

Data to delimit major roads, major railways and major airports are available from the Ministry of Transport, Telecommunication and Energy (KHEM) in decree 8003/2008. (HÉ 46.)[5]

14.3.2 Implementation issues

There has been a change in the number of agglomerations compared to the 1st round of strategic noise mapping. The Budapest agglomeration consists of the capital and its outskirts which means 22 separate municipalities altogether. In R1, Budapest and 21 lesser municipalities formed an association and made one common SNM which covered the whole territory of Budapest agglomeration. In the 2nd round, each of the 22 municipalities are each responsible for the completion of their own SNMs.

Table 140 – Designation issues - Hungary

Issue	Action
No specific problems were reported with relation to the designation and delimitation of sites.	

[181] Information available at: http://cdr.eionet.europa.eu/hu/eu/noise/df5/envsa6poq/

[182] The airport was renamed in 2011 to Budapest Liszt Ferenc International Airport

[183] available in English on http://www.ksh.hu/population_and_vital_events

14.4 Noise limits and targets

14.4.1 Objectives and Scope

Hungary has established a series of noise limit values, as presented in the table below.

Table 141 Noise limit values in Hungary

	Industrial facilities	Traffic-related noise sources
Noise target values in Hungary		
L_{den} (day, evening, night)	46 dB	63 dB
L_{night} (from 22.00 – 06.00)	40 dB	55 dB
Noise trigger values in Hungary*		
L_{den} (day, evening, night)	56 dB	73 dB
L_{night} (from 22.00 – 06.00)	50 dB	65 dB

**In addition to the target values, there are noise values above which action on noise-abatement should be carried out.*

The Governmental Decree 280/2004 (X.20) specifies that when noise limit values are exceeded there are applied measures for noise reduction for a period of 10 years. When noise trigger values are exceeded measures for noise reduction are applied for a period of 5 years.

According to Government Decree No. 280/2004, the L_{den} and L_{night} values in force for road, rail, airport and industrial noise, as presented in Table 5 below. In terms of acoustic criteria, the maximum noise emissions by source are specified as follows: for an industrial facility, L_{den} = <41 dB, L_{night} = < 35 dB; and for traffic-related noise source, L_{den} = < 58 dB, L_{night} = < 50 dB.

Table 142 Source specific noise limit values in Hungary

Noise Source	Noise Limit Values	
	L_{den}	L_{night}
Road-traffic noise	63	55
Rail-traffic noise	63	55
Aircraft noise around airports	63	55
Noise on industrial activity sites	46	40

14.4.2 Methods for establishing noise limit values

The values of L_{den} and L_{night} are determined by calculation, and Hungary has official national methods which can be used for road traffic noise, railway noise, noise propagation and industrial noise. It judged that there is no need for the application of foreign standards as Hungarian requirements take into account the specific features of Hungarian vehicles. Hungarian calculation methods conform to the Directive in every respect. Details of these calculations are given in the Annexes of Lärmknotor, 2003[184].

14.4.3 Associated enforcement and mitigation measures

Hungarian national law requires that the Hungarian Railways (MAV) must implement noise protection measures when constructing new or upgrading existing lines. MAV is also revising its noise protection measures (noise barriers, noise-insulated windows) when reconstructing or upgrading railway lines, and also revising its noise protection technology such as wagon warm-up systems, passenger information systems (loudspeakers), shunting operations and loading/unloading activities at freight terminals near residential areas[185].

The Decree No. 12/1983 [186](V. 12.) laid down rules that proved effective in forcing the operators of industries, mines, and agricultural sites to reduce the noise emission. According to this regulation in the case of contravention of the regulations in connection with emission limit values the operators were punished with a fine and was obliged to reduce the noise emission under the limit value.

14.4.4 Implementation issues

No issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in Table 143 below.

Table 143 Noise limits and targets - issues in R2 - Hungary

Issue	Action
Problems were encountered when printing SNMs at a 1:15,000 scale, since one set of printed SNMs consists of 133 A0 sized SNMs. Printing was significant in terms of cost and time.	No actions identified
It was regarded as labour-intensive to produce SNMs for industrial areas, since noise emissions from industrial sites are covered by different EU Directives (in particular the IPPC and the IED) and by different national legal regulations. Old industrial areas have generally closed down and the new ones have been built to conform to the environmental regulations – IPPC-obliged sites have a negligible	No actions identified

[184]Lärmknotor (2003): Guidelines to Strategic Noise Mapping and Action Planning, according to Directive 2002/49/EC. Available at: www.kvvm.hu/cimg/documents/Guide.doc.

[185] International Union of Railways and Community of European Railway (2007): Status Report 2007: Noise reduction in European Railway Infrastructure. Available at: www.cer.be/force-download.php?file=/media/publications/EN_Noise_Reduction.pdf.

[186] The decree was replaced in 2007 by Governmental Decree No. 284/2007 which sets out certain rules of environmental noise and vibration protection, but the basic theory has not changed.

Issue	Action
environmental noise impact compared to other noise sources[187].	
In some cases, when strategic noise mapping is carried out by different entities for the same areas (for example, railways inside an agglomeration, some SNMs may be produced by municipalities and a SNM in respect of major railway may be produced by a transport authority). This can mean that GIS data used for strategic noise mapping is not the same.	No actions identified

14.5 Quiet areas

In Hungary, quiet areas have been established through law 27/2008. (XII. 3.) Appendix 1 of the Ministry of the Environment (KvVM)[188].

14.5.1 Overview

No quiet areas have yet been established in Hungary during either Rounds 1 or 2.

Delimitation

A quiet area in Hungary is defined in Government Decree 280/2004 as: *"an area designated by the council of the community municipality (hereinafter referred to as: municipality) pursuant to a separate piece of legislation[189], which is subject to an increased degree of noise protection, as well as a quiet zone designated around facilities requiring an increased degree of noise protection."*

Agglomerations

Regarding the criteria used for the delimitation of quiet areas, Government Decree 280/2004 defines a quiet area as: *"an area designated by the council of the community municipality (hereinafter referred to as: municipality) pursuant to a separate piece of legislation[190], which is subject to an increased degree of noise protection, as well as a quiet zone designated around facilities requiring an increased degree of noise protection."*

Open country

The definition of quiet areas only applies to agglomerations.

[187] Berndt and Muntag (2008): Budapest Noise Mapping Project II – Results. Presented at Acoustics 08 – Paris, in association with EuroNoise.

[188] Information available at: http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A0800027.KVV

[189] Act No. XX. of 1991 "On Tasks and Powers of Local Municipalities and their Bodies, the Republic's Commissioners as well as Individual, Centrally Subordinated Bodies".

[190] Idem.

14.5.2 Implementation issues

Issues arising as a result of END implementation in R1 as identified in the 2011 implementation report as well as any further issues raised through the interview programme in respect of the early phase of R2 implementation are provided in the table below.

Table 144 Quiet area issues - Hungary

R1	R2
The Hungarian authorities perceived there to be a lack of clarity in the requirements relating to the delimitation and protection of quiet areas in open country.	Continued perception of a lack of clarity in the requirements relating to the delimitation and protection of quiet areas in open country.
Article 2 indicates that the Directive shall apply to environmental noise to which humans in quiet areas in open country, are affected, whilst Article 3 point (m) defines quiet areas in open country as "an area, delimited by the CA, that is undisturbed by noise from traffic, industry or recreational activities".	In Government Decree 280/2004, quiet areas are defined only for agglomerations.
In addition, Article 8, para. 1 and Annex V foresees the protection of quiet areas as the part of NAPs. However, there is a lack of guidance regarding the delimitation of quiet areas in open country, and their protection.	Still an issue. The producer of SNMs identified some areas within all nine agglomerations in order to be proposed as quiet areas. For the moment the municipality did not act in order to subscribe these quiet areas.

14.6 Strategic noise mapping

14.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown in the tables below.

Table 145 SNMs Hungary

	R1	R2
Agglomerations	1	8 (9)
Major airports	1	1 (1)
Major railways	1	1 (1) (914 km)
Major roads	1	2 (2) (2,903 km)

The R2 implementation position in respect of strategic noise mapping ("noise mapping") is now outlined. For R2, the number of **agglomerations** has increased from one agglomeration in 2007 to nine agglomerations in 2012, as a result of the transition to the definitive END threshold of 100.000 inhabitants. Noise mapping in agglomerations was prepared by nine different municipalities in R2 compared with only one in R1. Noise mapping of major railways was carried out by a single

organisation, the Institute for Transport Sciences Office, Environmental and Energy Division[191].

This information was then shared with the relevant city municipalities. For example, there are major railway sections both inside and outside of the Budapest agglomeration.

The mapping of **major roads** was carried out by a single organisation, the Institute for Transport Sciences Office, Environmental and Energy Division. Noise mapping of **major airports** was more complex because it was undertaken by different CAs.

14.6.2 Data collection

Government Decree 280/2004 states that for the communities within its agglomeration area, the methods applied to collect the traffic data and to determine the number of people concerned, as well as the computation programmes used for calculation shall be identical.

The data included in SNMs are to be based on the previous calendar year, and if data is not available they may be based on the most recently available data, which may not be more than four years old. Nearly all districts in Hungary have digital maps, with some districts having detailed 3D building data maps, and population data are available from the Central Statistical Office. Some of this data has to be purchased. Data also has to be submitted by the operators of traffic and industrial facilities.

Obtaining data for strategic noise mapping is the responsibility of consultants for agglomerations. Usually, the data for roads (Road administrations) and railways (Railway administrations) is provided by the public authority which is responsible for producing the initial noise mapping results. The responsible public authorities then pass on the data to the consultant who aggregates the data. The same approach is used for roads and railways whereby public authorities provide consultants with the data since they are responsible for data collection.

Further information about SNMs and NAPs is available on the website of the Hungarian Government.[192]

14.6.3 Strategic noise mapping methods

Detailed technical rules regarding the preparation of SNMs are specified in Decree 25/2004 (XII. 20) which states that:

- The calculation of the noise of public roads is made on the basis of the Road Technical Rules Út 2-1.302:2000 „Calculation of the noise of public road transport" as amended in 2003 according to the proposals of KTI Rt.
- The calculation of railway noise is made on the basis of the amended version of the standard MSZ 07-2904:1990 „Calculation of railway transport noise", developed in 2003 by KTI Rt. The calculation of noise propagation is made in accordance with the standard MSZ 15036
- The calculation of the noise of air transport is made on the basis of the method developed and published by KTI Rt, meeting the requirements contained in the

[191] http://www.kti.hu/

[192] Information available on the website of the Hungarian Government: http://www.kormany.hu/hu/foldmuvelesugyi-miniszterium/kornyezetugyert-agrarfejlesztesert-es-hungarikumokert-felelos-allamtitkarsag/hirek/strategiai-zajterkepek

common decree 18/1997. (X. 11.) of two ministries (KvVM and KTM) which makes reference to that method.

- The calculation of the noise is made on the basis of the following standards MSZ 15036, MSZ EN ISO 3744, MSZ EN ISO 3746: 1999 and MSZ ISO 8297: 1994.

14.6.4 Public accessibility of SNMs

The public has the possibility to access strategic noise mapping results on the internet, since noise maps and population exposure data has been made publically available on the website of the Hungarian Government (http://www.kormany.hu) and of Budapest municipality (http://terkep.budapest.hu).

14.6.5 Implementation issues

No issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 146 Strategic noise mapping issues in R2 - Hungary

Issue	Action
The National Cadastral Program was not in accordance with the timetable for undertaking strategic noise mapping. In order to get the necessary geospatial input data in time, the Ministry of Environment and Water negotiated with the organisation in charge of National Cadastral Program and the Program was rearranged.	No actions identified.
Inconsistent data quality is used in the development of noise maps. There are for instance different GIS used to produce SNMEs for the Budapest agglomeration and for major railways within the agglomeration. Taking into account the two examples it can be observed that the number of affected inhabitants is different.	
Input data should not be too detailed. Although the Central Statistics Office has detailed data on the number of inhabitants, it proved too time-consuming and labour-intensive to integrate these meta-data with the affected buildings. Less detailed data as described in the Good Practice Guide was instead utilised.	
The assessment height of 4,0± 0,2 m above the ground was not considered relevant for the preparation of SNMs. The problems have arisen on areas having houses of one storey, because in this case the real receiver points are much lower than 4 m.	

14.7 Noise action planning

14.7.1 Overview

An overview of NAPs is shown in the following table.

Table 147 NAPs – Hungary

	R1	R2
Agglomerations	1	8 (9)
Major airports	1	1 (1)
Major railways	1	0 (1)
Major roads	1	0 (2)

** The NAPs for Debrecen, Győr, Major railways and Major roads are not completed.*

Table 148 NAPs coverage – Hungary

	Major railways		Major roads	
	SNMs	NAPs	SNMs	NAPs
R1	25 km	n/a	539.4 km	n/a
R2	914.1 km	n/a*	2902.8 km	n/a*

**The NAPs for Debrecen, Győr, Major railways and Major roads are not completed.*

The estimation of the expected benefits is an essential element of NAPs. The consultants use an indicator which shows the number of people whose noise situation has been improved due to a given noise reduction measure implemented through the NAPs. Due to the fact that revised SNMs are not yet available, the implementation organisation has no information on the accuracy of the R1 estimations. Hungary national legislation emphasises the reduction in the number of people affected by high noise levels. According to this approach, the limited resources of the implementation bodies are used to improve the situation by prioritising areas that are worst affected by high levels of noise.

For the NAPs for roads and railways, whenever noise limit values are significantly exceeded, the operator of the transport facility is obliged to prepare a NAP to address the problem. However, if the given road or railway line has already drawn up a NAP derived from the END, then this serves the purpose of providing a basis to identify suitable noise reduction measures, and it is then unnecessary to draw up an additional action plan based on exceedance.

14.7.2 Methodologies for noise action planning

The information on NAPs provided in Government Decree 280/2004 is: "*NAPs can be prepared by the natural person or the business organization … or other artificial person holding a permit for expert activity in the field of environmental noise and vibration protection … The NAP shall contain the specifications for the noise reduction or other, technical, organizational, urban planning solutions and other measures aiming at noise protection (e. g initiation of administrative proceedings) which can be applied to prevent the increase of noise in quiet areas designated by the municipality or in areas to be protected from noise (or where such protection is intended) where the noise characteristics satisfy or do not exceed the …strategic threshold values*."

Government Decree 208/2004 states that in order to create a good foundation of the NAP, a noise committee can be established which would be responsible for consultation, counselling and the "harmonisation of interests".

Neighbouring Member States are supposed to cooperate on the NAPs for border regions (Lärmknotor, 2003). By late 2005, noise protection measures had been installed in the process of upgrading the three rail corridors of Hungary, namely Budapest – Hegyeshalom - Vienna, Budapest – Szolnok – Romania and Budapest – Boda – Slovenia.

Guidelines have been produced in Hungary on noise action planning at national level, available at: http://www.kvvm.hu/cimg/documents/ 12 tmutat zaj.doc.

14.7.3 Measures

According to Government Decree 280/2004, the NAPs for R1 and R2 must include the information as provided in Annex V of the END. Examples of the types of measures included in the NAPs are: traffic planning; land-use planning; technical measures at noise source; insulation; and measures to reduce sound transmissions. Priorities were set at national and local levels. The selection criteria include compatibility with existing legislation and the costs of implementation, the ease of implementation and the level of benefit in terms of the potential to reduce high levels of population exposure to environmental noise. Measures that benefit a higher number of people are prioritised.

14.7.4 Public consultations

Government Decree 208/2004 regarding public consultation requires the municipality that prepared a given NAP to inform the relevant public in a locally appropriate manner. Access is provided to the approved SNMs that serve as the basis for the NAPs concerning the area in question (location, date and time), and the contents of the NAP proposal and relevant objectives. The measures adopted in Hungary in R1 and R2 include: putting NAPs online, holding public meetings and launching a press campaign. The process appears to be more focused on communicating information to the public in NAPs that have already been drawn up rather than on informing the development of the NAP during its preparation. There was a questionnaire published on the Internet, but there was no substantial public involvement, as the participation was minimal. So, even the directly affected population was not aware of the role and mission of the directive and the new potentials provided by it.[193]

[193] Issue arise by Mr. Mihály BERNDT from OPAKFI

14.7.5 Implementation issues

Issues raised in R1 and R2, together with actions taken to address them are shown in the table below.

Table 149 Noise action planning issues - Hungary

R1	R2
Limited time from approval of SNMs to the development of NAPs and difficulties in conducting public consultations within this timeframe.	
In addition to public consultation, other administrative steps under national legislation also have to be taken to approve NAPs.	
The shared responsibility made it very hard to draw up an NAP that all stakeholders were ready to implement.	
Local government also lacked the skills to draw up an NAP.	The NAPs are realised by consultants with the final approval of local government
SNMs do not provide enough information to identify the real problem areas, because they do not use an indicator that combines the noise levels with the affected number of inhabitants.	Such an indicator was not developed. In accordance with the Annex 5 of Government Decree 208/2004, the NAP has to have an evaluation of the estimated number of people exposed to noise levels, the problems and situations that require improvement exploration. This is the way the number of inhabitants affected is provided in the NAP.
	The R2 NAPs for major roads and railways are still under development.
	There was no active public participation in the development process of NAPs. The Hungarian regulation transposing the END relating to consultation aspects focuses only on the provision of information to the public. Participation by the public in the consultation process is only optional.
	The sharing of responsibilities between different public authorities has made it hard to draw up a NAP that all stakeholders were ready to implement. Local government often lacked the skills to draw up an effective NAP.
	SNMs do not provide enough information to reveal the real conflicts, because they do not use an indicator that combines the noise levels with the affected number of inhabitants. It is recommended that such an indicator be developed. Guidelines have however been produced at national level, these are available at: http://www.kvvm.hu/cimg/documents/ 12 tmutat zaj.doc

15. IRELAND

15.1 National implementing legislation for END

15.1.1 Legal implementation

In Ireland, the Environmental Noise Directive has been implemented through the Environmental Noise Regulations 2006 (SI 140/2006)[194]. With regard to national legislation on environmental noise, the main relevant pieces of legislation in Ireland are the Environmental Protection Agency Act (Noise) Regulations 1994, and Sections 106, 107 and 108 of the Environmental Protection Agency Act 1992.

The EPA Act has now been superseded by the EU (Industrial Emissions) Regulations 2013, S.I. 138 of 2013. These Regulations primarily amend the EPA Act 1992 as amended and the Waste Management Act 1996 as amended, to transpose Chapters II and VI of Directive 2010/75/EC on industrial emissions (IPPC).

Noise issues can also be addressed under Section 77 of the 1993 Roads Act, as amended, which provides that the minister may, after consultation with the EPA, issue regulations requiring road authorities or the Authority to carry out works or take such other measures as are necessary to mitigate the effects of road traffic noise in respect of such types of public roads constructed or renovated as specified in the regulations.

15.1.2 Scope of END implementation – Rounds 1 & 2

R1 Strategic noise mapping and Noise action planning in Ireland covered one agglomeration (Dublin), one airport (Dublin) and 564km of major roads outside the agglomeration. In addition, 8km of Major Rail (above 60,000 train passages per annum) in R1 (Connolly to Howth Junction) was also mapped. This section is within the Dublin Agglomeration Area. The first phase of Strategic noise mapping was mainly implemented by five Strategic noise mapping bodies (NMBs) while 26 Noise action planning authorities (APAs) were involved in the development of associated NAPs[195].

In R2, one additional agglomeration (Cork) fell within the Directive's scope. There was also a major increase in the amount of Strategic noise mapping required for major roads with 8,330 km of major roads outside agglomerations mapped in the second round. In both R1 and 2, whilst Strategic noise mapping was carried out for Dublin airport, the maps were incorporated to support the development of the Dublin agglomeration NAP. An overview of END coverage by Round is provided below:

Table 150 END coverage – Ireland

Round	Agglomerations	Major airports	Major rail	Major roads
1	1	1	8 km	564 km
2	2	1	189 km	8,294 km

[194] http://www.irishstatutebook.ie/2006/en/si/0140.html

[195] Implementation of the EU Environmental Noise Directive: Lessons from the first phase of strategic noise mapping and action planning in Ireland, E. A. Kinga, E. Murphy, H.J. Rice

15.2 Competent Authorities and designated administrative bodies

The Environmental Protection Agency (EPA - http://www.epa.ie/) is responsible for reporting to the European Commission so as to meet the relevant Strategic noise mapping and Noise action planning timelines. According to the Environmental Noise Regulations 2006, the EPA functions are to: exercise general supervision over the functions and actions of noise-mapping bodies and Noise action planning authorities; and to provide guidance or advice to such bodies and authorities. The Department of the Environment, Community and Local Government has the lead authority in relation to policy issues.

It is important to note that in Ireland, under the legislation transposing the END, a distinction is made between strategic noise mapping bodies and noise action planning authorities (whereas in most other countries, these functions are carried out by competent authorities, without a clear distinction between these roles, which is instead determined in national implementation arrangements rather than in the legislation.

Strategic noise mapping bodies produce SNMs on behalf of the relevant noise action planning authorities. Whilst some mapping bodies are also engaged in action planning too, this is not always the case. Taking a practical example, the National Roads Authority (NRA) in Ireland is responsible for carry out extensive noise mapping, but is not involved in action planning since it is not a designated national action planning body under Irish national law.

The responsibilities for END implementation of other institutions are shown in the table below.

Table 151 Responsibility for SNMs and Noise action planning in Ireland

Role/Activity	Agglomerations	Roads (outside agglomerations)	Railways	Airports
Data collection	Local authorities	National Roads Authority (NRA)* For non-national roads the relevant (local) road authority or authorities, as appropriate[196]	Local authorities	Dublin Airport* Authority and Fingal County Council
Preparing SNMs			Irish Rail[197] Railway Procurement Agency (RPA)[198] Local authorities**	
Approving SNMs				
Preparing NAPs		Local authorities	Local authorities	Dublin local authorities
Approving NAPs				
EC/EEA reporting				

** Strategic noise mapping only ** data collection only*

[196] For major roads: where such roads are classified as national roads in accordance with Section 10 of the Roads Act 1993 (No. 14 of 1993), the National Roads Authority, on behalf of the action planning authority or authorities concerned,

[197] Major heavy railways above 30,000 train passages and all heavy railway within Agglomeration Areas

[198] Major light-railways (LUAS lines) above 30,000 train passages, railways within Dublin agglomeration

For agglomerations, although all local authorities are nominally involved, in practice, the lead coordination role in mapping has been played by particular local authorities. In Dublin, for instance, there are four local authorities that provided input data for Strategic noise mapping for the Dublin agglomeration but the mapping work was coordinated and led by a single local authority, Dublin City Council (DCC). For major roads outside the agglomerations, Kildare Co. council acted as the lead authority for R2, but worked closely with the National Roads Authority (NRA).

A number of designated Strategic noise mapping bodies, such as the NRA, Irish rail, Railway Procurement Agency (RPA), and the Dublin Airport Authority are all involved in Strategic noise mapping but they do not have a specific role in Noise action planning. An interesting feature of the approach in Ireland (in contrast to the UK) is that some national mapping bodies are undertaking the work in-house (e.g. NRA, RPA and DCC for the Dublin agglomeration.

15.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

15.3.1 Data collection

For R1, data was available for the identification of major airports, agglomerations and railways, but only for some roads. In a number of cases, specific surveys were required to generate this data.

In R2, the NRA collected aerial LiDAR data for approximately 3,019km of the Irish national road network. The survey corridor was 1,200m in width. The survey was completed in early 2011 and outputs included 1 metre contours for the entire survey area, building height information for buildings within the survey corridor as well as a digital terrain model.

15.3.2 Implementation issues

For R2, there were no new technical issues raised during the review process. The EPA set up and co-ordinated a Steering group to deal with policy and administrative issues, as well as a Technical Working Group to address any specific technical issues or questions which arose during the Strategic noise mapping process, and to share experience and best practice. The working groups met on a bi-monthly basis over a two-year period, and the EPA also arranged a number of workshops for the NMBs in relation to Strategic noise mapping and Noise action planning.

Table 152 Designation issues - Ireland

R1	R2
Consistency of data generated by different surveys.	No specific issues identified.

15.4 Noise limits and targets

There are currently no ambient noise limits specified in Ireland. The EPA may set noise limits in respect of certain activities that are subject to IPPC licensing; relevant guidance is set out in the EPA publication *"Guidance Note for Noise in Relation to Scheduled Activities"*, which was updated in 2012[199]. The IPPC Licensing Guidance Note for Noise in Relation to Scheduled Activities suggests typical noise limits of 55 dB($_{Ar,T}$) for day, 50 dB($_{Ar,T}$) for evening and 45 dB($_{LAeq,T}$) for night-time, though lower limits may be applied at "sensitive locations" with low background noise levels, or if it identified as a Quiet area for any proposed developments.

Section 107 of the EPA Act 1992 provides LAs with powers to require measures to be taken to prevent or limit noise. These powers are generally exercised in preventing and limiting noise from commercial and industrial premises within their functional areas. A Notice can be served by a LA on any person in charge of any premises, processes or works, other than an activity controlled by the EPA.

In relation to road traffic noise, the most common noise indicator is the L_{A10}, which under the UK CRTN method is measured over 18 hours. Prior to the implementation of the END, the design goals for new national road developments was 60dB (L_{den}). Although the 2004 guidelines issued by the NRA[200] specified a noise limit value target in the design of new national roads in Ireland of L_{den} 60 dB, this is not a mandatory requirement.

There was strong consistency between the R1 and R2 NAPs for the Dublin agglomerations in terms of the target limit values. In the Dublin agglomeration NAP 2013-2018, preferred sound levels have been set at < 50 dB(A) L_{night}, < 55 dB(A) L_{day}, while maximum desired was classified at > 55 dB(A) L_{night}, and > 70 dB(A) L_{day} respectively.

15.5 Quiet areas

15.5.1 Overview

An overview of the situation in respect of quiet areas in Rounds 1 and 2 is provided in the following table:

Table 153 Quiet areas – Ireland

	R1	R2
Number	0	8 (Dublin)
Size (km^2)	N/A	N/A

For R2, there were 8 designated Quiet areas within Dublin City[201]: There are no quiet areas in open country. There are currently no designated quiet areas in Cork. In the 2013-2018 NAP for Cork, it is mentioned that "In the life of this NAP it is proposed to identify quiet areas in consultation with the public".

[199] https://www.epa.ie/pubs/advice/noise/NG4%20Guidance%20Note%20(April%202012).pdf

[200] See National Roads Authority publication "Guidelines for the Treatment of Noise and Vibration in National Road Schemes" http://www.nra.ie/environment/environmental-planning-guidelines/Guidelines-or-the-Treatment-of-Noise-and-Vibration.PDF

[201] www.dublincity.ie/sites/default/files/content//WaterWasteEnvironment/NoiseMapsandActionPlans/Documents/ProposalQuietAreas.pdf

The Environmental Noise Directive (END) and the Irish Regulations transposing the Directive do not give precise guidance as to how to define a quiet area within an agglomeration. The Irish regulations state: - "quiet area in an agglomeration" means an area, delimited by a Noise action planning authority following consultation with the Agency and approval by the Minister, where particular requirements on exposure to environmental noise shall apply; (S.I. No. 140 of 2006 -Environmental Noise Regulations 2006).

While the EPA Guidance note for NAPs does provide some guidance on how quiet areas should be defined, it also notes that there is no universally accepted definition for quiet zones. It indicates that a range of criteria can be used, and it cross-references areas of SNMs below 55dB L_{day} with a dataset of public open spaces. During the implementation of NAPs, the EPA had proposed that possible additional quiet areas could be identified, and had suggested that the existing noise levels could then be preserved or reduced if possible.

There are examples of ways in which criteria to define quiet areas have been developed in Ireland. For example, in the Dublin agglomeration NAP for 2013-2018, the following limit values have been defined as one of the criteria to be used in defining a quiet area.

- < 45 dB(A) L_{night}
- < 55 dB(A) L_{day}
- < 55 dB(A) L_{den}

In the NAP adopted by Dublin City Council in 2008, an absolute value was set of below 55db L_{day} and below 45 decibels for L_{night} as criteria for defining a quiet area. A second criterion related to the concept of relatively quiet areas was also proposed. Such locations are defined by their proximity to areas with high noise levels, and which are valued by the public as a perceived area of tranquillity, such as a local park or green area. Both quantitative and qualitative assessments are used to identify these types of locations. In 2003, the EPA commissioned a research project to meet the requirements of the END in relation to quiet areas. The study sought to establish baseline data for Ireland[202] for the identification of quiet areas. The focus was on quiet areas located in rural areas, rather than in urban areas. The overall definition of rural quiet areas in Ireland is *"an area in open country, substantially unaffected by anthropogenic noise."* The following minimum distance criteria were defined for identifying rural quiet areas:

[202] Waugh, D. *et al*. (2003): Environmental Quality Objectives, Noise in Quiet Areas, Synthesis Report. Prepared for the Environmental Protection Agency, by SWS Environmental Services, SWS Group, available at: http://www.epa.ie/pubs/reports/research/land/noiseinquietareassynthesisreport-epa.html#.VWWj8M9VhBc

Table 154 Rural Quiet Area criteria

Minimum distance from any …	Other Factors
Urban areas with a population >1,000 people (3km) Local industry (3 km) National Primary Route (5km) Motorway or dual carriageway (as recommended in EU studies) (7.5km) Major industry centre (10km) Urban areas with a population of >5,000 people (10km) Urban areas with a population >10,000 people (15 km)	Low population density Low agricultural productivity (away from intensive farming) Good network of minor roads/tracks to facilitate accessibility and noise monitoring Topography, elevation and land use, including flight paths, wind direction and rural activities Inclusion of a selection of sensitive ecological habitats and land uses at varying elevations Proximity to and inclusion of areas designated for conservation and places of high amenity value with regard to their natural soundscape and transport pressures, in particular traffic flow on national primary and regional routes along the densely populated east coast compared with the low- density population on the western side of the country

However, the conclusions and recommendations in relation to this research project were not followed up on.

The identification of quiet areas was one of the responsibilities of Noise action planning authorities when preparing their NAPs (NAPs). However, it was not referred to in the Dublin Agglomeration NAP, as this dealt with quiet areas in an urban environment. It had been intended that the main findings & recommendations of the report would be made available to the relevant planning authorities, but this did not happen for various reasons (ex. EPA staff re-assigned to other areas).

The methodology used in the Waugh *et al* (2003) report[203] was part of a national 18-month monitoring programme to develop criteria for identifying quiet areas and to establish comprehensive environmental quality standards for quiet areas. Special consideration was given to Natural Heritage Areas, Special Protection Areas, RAMSAR sites and places of high amenity value with regard to their natural soundscape. Measurement locations were chosen to provide sound-level data that would be indicative of what may be experienced by persons frequenting the area. Digital sound recordings were made at some sites to have data representing actual sounds, and physical acoustical measurements were undertaken with GIS modelling to select the sites.

[203] Op cit 74

15.6 Strategic noise mapping

15.6.1 Overview

An overview of the number of SNMs produced in Rounds 1 and 2 is shown below.

Table 155 SNMs - Ireland

	R1	R2
Agglomerations	1*	2*
Major airports	1	1
Major railways		1 (189 km)
Major roads	1	1 (8,294 km)

For R1, since this was the first time that SNMs had been developed at a national level in Ireland, the development of the maps was driven by communication between the various Strategic noise mapping authorities and supported by guidance received from the EPA through various meetings, workshops and presentations[204].

The NRA[205] is a designated Strategic noise mapping body, developed SNMs for all major roads outside agglomerations. In addition, it offered to undertake the Strategic noise mapping of non-national roads identified as major roads on behalf of local authorities. All local authorities within the Dublin and Cork agglomerations dealt with non-major roads for their own areas of jurisdiction. Dublin City Council, together with Fingal County Council, were both primarily responsible for the development of the SNM for the agglomeration of Dublin. These two authorities were also supported by South Dublin County Council and Dún Laoghaire/Rathdown County Council. The SNM for Dublin Airport was developed by the Dublin Airport Authority.

In R2, as shown in the table above, the scope of mapping coverage was significantly extended for major roads. Whereas only 564kms were mapped in R1, this was extended to 8294 in R2. For major railways[206], there was an increase from 58kms to 189.

A national Strategic noise mapping website developed by the NRA provides details on the SNMs produced in 2012 is available here: http://nra-gis.maps.arcgis.com/apps/Compare/Configure/index.html?appid=0a26a9dd79fd44a68dd90f5445449701.

[204] Implementation of the EU Environmental Noise Directive: Lessons from the first phase of strategic noise mapping and action planning in Ireland, E. A. King, E. Murphy, H.J. Rice, Department. Trinity College and Dublin University College, Ireland

[205] The NRA and RPA have now merged to form Transport Infrastructure Ireland (TII).

[206] http://www.irishrail.ie/about-us/strategic-noise-maps

15.6.2 Data collection

The main guidance documents and data sources utilised relating to Strategic noise mapping are summarised in the following table:

Table 156 Strategic noise mapping – data availability and collection methods - Ireland

R1	R2
Specific surveys were necessary to generate the data required for Strategic noise mapping. The Environmental Noise Data Reporting Mechanism Handbook (2007) and the Report Network Delivery Guide were used. EPA Guidance Note for Strategic noise mapping for the Environmental Noise Regulations 2006 (2009)	The EPA updated its 2009 *Guidance Note for Strategic noise mapping* in August 2011 to reflect developments in R2. EPA Guidance Note for Noise action planning 2009 2013-2017 NAPs have also been published – see for example Dublin agglomeration[207].

The institutional responsibilities for carrying out Strategic noise mapping were outlined in the section on CAs and bodies above. A distinction can be made in this regard between designated "mapping bodies", such as the National Roads Authority, which undertook Strategic noise mapping for national roads outside agglomerations (but was not responsible for Noise action planning) and public authorities, such as Dublin City Council which were not only involved in mapping but also nominated as "Noise action planning authorities".

15.6.3 Strategic noise mapping methods

In R1, the UK's CRTN method was used for road traffic noise (Department of Transport and the Welsh Office, UK, HMSO, 1988), and the UK's CRN method for railway noise (Department of Transport and the Welsh Office, UK, HMSO, 1995). CRTN was used for the development of SNMs from road traffic noise for both major roads and agglomerations in Ireland in R1. These methods were included because they have been used previously as part of Environmental Impact Assessments (EIAs) in Ireland, in relation to new road and rail developments. For Dublin airport the ECAC method was used (Doc 29 2nd Edition) as well as INM[208] 6.2a for airport Strategic noise mapping.

In R2, the following changes were made:

RMR Interim was the method to be used for R2 railway noise. CRN was used for the calculation of Rail maps in R1. For consistency with R1, EC adapted Interim Method, Reken en Metvoorschrift Railverkeerslawwaai (RMR Interim) method was used for assessment of railway noise levels.

- The adapted UK CRTN was confirmed as the method to be used for R2 road traffic noise.
- Data input requirements for road source were amended to the UK CRTN method. Road traffic modelling and flow attributes also used the UK CRTN method.

[207] www.dublincity.ie/sites/default/files/content/WaterWasteEnvironment/NoiseMapsandActionPlans/Documents/DublinNoiseActionPlan2013-2018Final.pdf

[208] Although INM 7 is considered by many users as the better technical solution.

In R2, the EPA provided revised Strategic noise mapping guidance and support to Local Authorities on mapping. For instance, in respect of major roads, the revised guidance note covered issues such as producing datasets, as well as traffic flow data. In addition, a number of workshops (3) were organised to cover both Strategic noise mapping and Noise action planning. The NAP for Dublin agglomeration includes the airport.

For major roads, there was a centralised approach to Strategic noise mapping. All SNMs were developed based on modelling calculations and predictions. Specialist Software was used e.g. Predictor, ArcGIS.

Within the Dublin Agglomeration, population exposure statistics were based on incident sound calculation points at the façade of the buildings with the highest sound value.

15.6.4 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 157 Strategic noise mapping issues - Ireland

R1	R2
Lack of training and previous experience in preparation of SNMs among local authorities.	A revised guidance note was issued by the EPA on Strategic noise mapping in 2011.
Gaps in input data and dependence on carrying out surveys.	Experiences gained and knowledge has been transferred e.g. from Dublin City Council to Cork County Council. Dublin City Council acquired technical expertise in mapping during R1, and has supported local authorities in the Cork agglomeration that weren't included in R1 as an agglomeration.
Lack of guidance/information on cost-effective survey methods.	The importance of frequent coordination between different types of Strategic noise mapping bodies with responsibilities at different levels of governance was stressed (e.g. road maps for agglomerations were dependent on NRA at national level).
Lack of guidance on data requirements and choice of methods for noise models. Lack of standardised method for calculating population exposure levels in Europe.	There remains a lack of standardised method for calculating population exposure levels in Europe.
Reported façade data were not used – interpolated contour data were used as an alternative. Estimates of population exposure risk being erroneous.	
Lack of availability of robust data sets.	

In undertaking Strategic noise mapping, extensive coordination was needed between organisations involved in mapping and Noise action planning at different levels of governance specially to produce SNMs and NAPs for agglomerations. For instance, local authorities had to liaise with each other and with the NRA.

An evaluation survey of Strategic noise mapping bodies that was carried out by the EPA at the end of R2 did identify a number of issues (modelling data, qualified

personnel, reduced budgets) that the Strategic noise mapping bodies felt would need to be considered at the start of the Round 3 process.

15.7 Noise action planning

15.7.1 Overview

Table 158 NAPs Ireland

	R1	R2
Agglomerations	1 (1)	2 (2)
Major airports	1 (1)	1 (1)
Major railways	0	0
Major roads	22	26

The following data was provided by the Irish national competent authority.

R1 NAPs 2008-2013 (all infrastructure, including within an agglomeration)

- 23 NAPs were produced.
- 27 Local authorities were involved in the process of producing these NAPs

R2 NAPs 2013-18

- 28 NAPs were produced.
- 34 Local authorities were involved in the process of producing these NAPs.

Major Rail 2013:

SNM**:** One SNM was produced for all major rail in Ireland (189 km).

- The **Dublin agglomeration** NAP included the major rail section (150km)
- The Kildare NAP included actions for this section of major rail.

Major Airports 2013:

- A SNM derived from computation was prepared for Dublin airport, and the validated data was then incorporated into the SNM for Dublin agglomeration.
- The NAP for **Dublin agglomeration** includes the airport (as part of requirements within agglomerations to map aircraft noise, but there is no separate dedicated airport action plan).

15.7.2 Methodologies for noise action planning

The EPA issued a guidance note for the development of NAPs in R1. The final version of this document was published in July 2009. The action guidance note also refers to other guidelines such as the WHO guidelines, the UK DfT levels for airports, Irish criteria relating to industrial noise (IPPC guidance), as well as English planning guidance for railways and guidance on undertaking cost-benefit analysis. The guidelines put a strong emphasis on setting priorities locally.

15.7.3 Measures

Among the summary measures identified following a review of the NAPs submitted were:

- Noise mitigation measures for roads, such as traffic planning and the installation of noise barriers
- Promoting greater consideration of environmental noise related issues in land-use planning
- Measures to promote greater use of public transport and to encourage people to walk and/ or cycle more, etc.

Among the selection criteria for the identification of measures to tackle noise on a prioritised basis in NAPs is whether a cost-benefit assessment has been carried out of the proposed measures and whether sufficient reference has been made to guidelines on noise limits.

Some information was available on noise mitigation measures for roads. For example, during R1, the M50 Upgrade Scheme required the installation of noise barriers and low noise road surfacing measures. This Scheme led to the construction of 16km of new noise barriers, and 7km of existing barriers had their height raised. Most of the proposed barriers are 2-4m in height, but some are up to 6m. A noise and vibration assessment was undertaken for the construction and operation of the proposed scheme. The assessment was undertaken with regard to the guidance set out in the National Roads Authority (NRA) Draft Guidelines for the Treatment of Noise and Vibration in National Road Schemes 2004.[209]

15.7.4 Public consultations

Public consultations in Ireland require that Noise action planning authorities must ensure that:

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

With regard to how the public consultation process is managed, taking the NAP 2013-2018 for the Dublin agglomeration as an example, feedback was sought over a 5-week period from statutory bodies and the general public. In order to publicise the consultation, advertisements were placed in two national Irish newspapers requesting feedback on the draft NAP. Copies of the draft NAP were placed in each of the four Council Offices comprising the Dublin agglomeration and an e-version was placed on each of the Council websites. Thirteen responses were received, four from statutory bodies, four from residents' associations and community groups and a further five from individuals. The final version of the NAP provides a summary of the responses received to the public consultation in Section 8 with detailed responses set out in Annex G.

[209] https://www.engineersireland.ie/EngineersIreland/media/SiteMedia/groups/societies/roads-tranport/The-Upgrade-of-the-M50-in-the-context-of-an-integrated-approach-to-transportation-in-Dublin.pdf?ext=.pdf

Other initiatives have also been undertaken to improve information and data availability for the public. For instance, in the NAP 2013-2018 for the Dublin agglomeration, data was made available in 2014 from the ambient sound monitoring networks gathered through the implementation of the previous NAP 2008-2013.

15.7.5 Implementation issues

Issues related to implementation during Rounds 1 and R2 are highlighted below:

Table 159 Noise action planning issues - Ireland

R1	R2
Availability of sufficient funding to implement plans	There was good cooperation between the various Strategic noise mapping bodies in relation to Strategic noise mapping. However, there was less interactions when it came to the NAPs. Part of the problem relates to Noise action planning processes being localised whereas the budget needed to implement measures and legal jurisdiction e.g. over the railways and road network is at the national level. Therefore, there may be a mismatch between measures mentioned in NAPs and the ability to implement these (funding, practical constraints, other strategic planning processes being out of synch)

16. ITALY

16.1 National implementing legislation for END

16.1.1 Legal implementation

Legislative Decree No. 194/2005 of 19 August 2005 transposes the specific requirements of the END[210]. It defines the powers and procedures for Strategic noise mapping, the development and adoption of NAPs to reduce noise, and the provision of information to the public.

In addition, noise pollution issues are regulated under Law No. 447 of 26 October 1995, Framework Law on Noise Pollution[211], which contains noise limit values. For road infrastructures, the Environment Ministry Decree of 29 November 2000[212] and Presidential Decree No. 142 of 30 March 2004[213] set noise limit value, as well as establishing the technical parameters for building the noise mitigation works. Equally, the Presidential Decree 18 November 1998 n. 459 regulates noise pollution emissions produces by railways network traffic. [214].

The Italian law regulating noise pollution (447/1995) also introduced a series of implementation decree, including the D.P.C.M 14 November 1997 "Definition of noise value limits of noise sources" which establish the criteria for the acoustic classification in the territory and the respective noise limits.

In order to comply with the directive and accounting, at the same time of the national legislative framework, in 2012, the national CA developed guidelines to support in the implementation of the second round of implementation of the directive.

Although the END is implemented through a national legal framework, Italy has a federalised administrative structure, with each region being responsible for designating the responsible CAs for agglomerations and major road infrastructure at local level (i.e. provinces, municipalities). According to the Italian procedure, regions are also responsible for verifying the accuracy of SNMs and NAPs, and for communicating with the national CA. As mentioned above, the latter has the overall responsibility of formally verifying all NAPs and submit them to the Commission via the EIONET reporting system.

The Italian Ministry of the Environment has overall responsibility for END implementation. In this report, since it would not be possible to comprehensively cover all Italian regions in a single country report, more detailed information is provided for the Tuscany region, which was chosen because this was the focus of the Milieu country report in 2010 so a continued focus on the region will help to ensure consistency when making comparisons between Rounds. While the significant reference to the Tuscany region data and experience has repercussions for the applicability of information for the whole country, the expertise and know-how demonstrated by the responsible officials in the Tuscany regional authority means that their feedback adds value to the assessment of implementation in Italy. Wherever data is available on a national level, an overview of the national state of play is provided.

[210] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2005;194

[211] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:1995-10-26;447!vig=

[212] www.gazzettaufficiale.it/eli/id/2000/12/06/00A15030/sg

[213] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.del.presidente.della.repubblica:2004-03-30;142!vig=

[214] www.gazzettaufficiale.it/eli/id/1999/01/04/098G0508/sg

16.1.2 Scope of END implementation – Rounds 1 & 2

R1 of Strategic noise mapping and Noise action planning in Italy included 11 agglomeration with more 250.000 inhabitants per each agglomerations, 9 major airport(s) with more than 50,000 movements per year, and approximately 10,762 km of major roads with more than 6 million of vehicles per year, and 646 km of railway with more than 60 thousand trains per year.

The introduction of thresholds in R2 led to the coverage of agglomerations with more than 100,000 inhabitants, major railway lines with more than 30,000 trains per year, and major roads with more than 3 million of vehicles per year. [215]

The following table summarises the documentation concerning SNMs as requested in R1 and R2. The second column provides the data concerning the update of the data requested in R1, but were submitted in R2.

Table 160 END coverage – Italy[216]

Round	Agglomerations	Major airports	Major rail	Major roads
1	11	9	646 km	10,762 km
2	29	10	3,457 km	13,559 km

In terms of the national context and key developments since the Directive was adopted, there have been a number of developments to tackle noise in major roads. In 2011, the Italian Ministry of the Environment approved the Containment and Abatement Plan for Noise from Motorways through decree no. GAB - DEC - 0000034 of 11.03.2011 which was published in the OJ of 04.05.2011 with the specifications and requirements specified in the Scheme of Understanding approved in the Conference of the State and Regions in its meeting session of 18.11.2010.

Further key national legal developments in support of the technical implementation of the Directive were expected; however, the Italian government have not yet released them[217]. These were supposed to:

- Decree of the national government by 2008: to define criteria and algorithms to convert noise limit values as for art.2 of national legislative decree 447/1995, for acoustic indicators L_{den} e L_{night};
- Decree of the Ministry of the Environment by April 2006: to define criteria for developing SNMs and respective NAPs;
- Decree of the Ministry of the Environment by April 2006: to define criteria for determine environmental noise indicators and associated harmful effects;
- Decree of the Ministry of the Environment by October 2006, aiming at coordinating the implementation of the Directive in relation to the national Framework Law on environmental noise control and management (Dls. 447/95);

[215] ISPRA. State of art relating to Action Plans and Noise Reduction and Abatement Plans in Italy.

[216] EIONET Report, Country Report Italy.

[217] Callegari & Poli (2008) IL RECEPIMENTO ITALIANO DELLA DIRETTIVA 2002/49/CE: RIFLESSIONI E PROPOSTE PER IL COORDINAMENTO CON LA NORMATIVA VIGENTE AI SENSI DELLA L 447/95. AIA report for the 35th National Conference.

- Decree of the president of the Republic by October 2006: to agree on the amendments necessary to ease and improve the technical implementation of the Directive in relation to the national Framework Law.

Because of the delays in the national legal implementation during the period between R1 and R2, in April 2013, Italy was involved in infringement proceedings by the Commission for lack of compliance with the Directive 2002/49/CE requirements regarding R1.

In order to improve the Directive's implementation procedures by national CAs, the Ministry of Environment has developed guidance line to assist national bodies in the development of SNMs, NAPs and data requirements as well as providing default format to present and edit the documentation.

So far, the Italian regulation (194/2005) that regulates the implementation of the Directive has not changed nor updated. However, the Ministry of Environment maintains active by organising working groups and workshops with the aim of engaging designated CAs to agree a common way of gathering and elaborating data in respect of the guidance handbook provided by the commission. The art n. 19 of the law 30 October 2014, n. 161 "Regulations for the implementation of the European Law 2013-bis" delegates the Government to harmonise within 18 months the national regulation regarding noise pollution through the Directives 2002/49/CE, 2000/14/CE and 2006/123/CE, and with the Regulation (CE) n.765/2008.

16.2 Competent Authorities and designated administrative bodies

The Italian Ministry of the Environment is the national CA in Italy. Its role is to communicate and report to the Commission on the state of play of the directive implementation at national level. To comply with this procedure, the Ministry of Environment receives technical support by ISPRA, which is the National Institute for Environmental Protection and Research. The Institute supports the Italian Ministry of the Environment with the technical analysis of data and by attending technical meeting and working groups at national and European levels.

As mentioned in the section setting out the overview of the context at national level, there is a regionalised approach to END implementation, with regional authorities playing an important role.

Taking the Tuscany region as an example, the region is responsible for designating the CAs in charge of developing SNMs and related NAPs for the identified agglomerations and road infrastructures as specified by the Directive. In doing so, the region takes into account specific areas of competence concerning roads networks, reflecting whether they are managed at the province or municipal level. Table 5 below gives an overview of different authority level and areas of responsibility.

Table 161 Administrative Responsibility for the END - Italy

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities	Regional Authority[218] Provinces Municipalities	Italian Railway Network	Airport operator
Approving SNMs				
Preparing NAPs				
Approving NAPs				
EC/EEA reporting	Ministry of Environment			

[218] Some national Roads are managed by licensed authorities such as Autstrade Srl or ANAS

Specifically, the region requires the provinces to provide data and develop SNMs and NAPs for roads networks with an annual average traffic of over 3 million vehicles. The same applies to the municipalities, which are responsible of agglomeration with over 100,000 habitants.

The region is then responsible for verifying the factual accuracy of data and for the submission of the requested documentation to the national CA. In addition, the region also plays a coordinating role between the various government levels and the public. However, to be specific, it is the responsibility of the municipalities to arrange for public consultation before approving the NAP[219].

Responsible administrative bodies for the collection of data include the authorities of the Tuscany region, the Unit for Protection against electromagnetic, acoustic, and environmental radioactivity and ARPAT, which is the regional public body responsible for environmental protection in Tuscany. They also support provinces and municipalities with technical issues and data gathering.

Responsible administrative bodies for making and approving SNMs and NAPs include the Region of Tuscany (Unit for the Coordination of Transport and Logistics), Settore Viabilità di Interesse Regionale, the provinces of Firenze, Livorno, Pistoia, Pisa, Siena and Lucca and the City of Florence, Prato and Livorno.

In Italy, ensuring effective coordination of responsibilities between different administrative bodies is considered a problem. For example, municipalities due to lack of financial resources, capacity and knowledge failed to submit data and develop requested documentation in due course.

In R2, some municipalities made significant progress thanks to the additional guidance provided by the national CA. The latter worked to secure further engagement from local authorities and region to avoid the lack of commitment that happened during R1. In Italy, major implementation difficulties are related to the lack of coherence and coordination between the directive and the national framework law (447/95). During R1, a lack of clarity led to a duplication of efforts between national and local authorities.

16.3 Designation and delimitation

16.3.1 Data collection

The Italian Ministry of Environment has the overall responsibility for reporting data to the EEA through the Reportnet system within EIONET. In order to do so, ISPRA and the regional authorities provide technical, administrative and coordination support.

As mentioned before, regional authorities assign provinces and municipalities the responsibility for collecting data in respect of major roads at regional level and agglomerations. One of the interviewees indicated that the data collection required lots of communication between various departments.

Practical responsibilities for roads, railway and airport are allocated to different CAs, which have to report to the region on the progress made.

For example, responsibility for roads is shared between the provinces at regional level and local authorities. The provinces are responsible for Strategic noise mapping and Noise action planning for major roads that are not national highways or local/municipal roads. Local authorities at municipal level, which are considered

[219] http://www.regione.toscana.it/-/inquinamento-acustico

agglomerations, are responsible for the provision of data and information on local / municipal roads.

16.3.2 Implementation issues

A number of issues were raised because of experiences over both Rounds.

Table 162 Designation issues

R1	R2
Several Italian authorities indicated that the interpretation of the Directive concerning the term "agglomeration" raised significant issues for the designation of responsibilities. The Tuscany region intervened through its own law in order to resolve compatibility issues, which allowed identifying the agglomerations and related CA. This meant allocating tasks to the bodies in charge of the implementation of the European directive as specified in the Italian decree (lr. 89/98[220], edited with the latest lr. 39/2011)	Due to the geographical extension of agglomerations, managing the respective amount of data proved to be challenging. Difficulties were particularly experienced by CAs in charge of gathering data, which were different from those responsible of developing NAPs. This caused delays.
Competent and public authorities indicated that the transmission of data across all different authorities' levels posed serious difficulties due to the difference of data format adopted and data availability.	Same although some improvements occurred between R1 and R2. National guidance supported CAs in adopting same methods and format to analyse data.
CAs indicated the issue of coherence between the directive and the national legislation with regard to "quiet zones" and the action required to address such issues.	Same although some improvements occurred between R1 and 2. National guidance supported CAs in clarifying identification criteria for quiet zone in Italy, although it is still problematic. Via Regulation n. 2/R/[221], the Tuscany region has approved technical guidelines to identify quiet areas (these in the Italian legislation are called "silence zones") in a manner not properly suitable to the directive meaning) and linked them to the noise classification as foreseen by the national law.
The list of major railways in Italy changed between 2005 and 2008. This caused some difficulties for the 2008 reporting exercise. The Italian state railways mentioned however that some transport managers had trouble delivering study results that they had carried out to CAs in agglomerations.	The RFI respondent reported that several difficulties were encountered with the strategic map format to be used, which kept been updated until after the submission deadline. The problem of the different formats used by different authorities has been an issue for the CA of the agglomeration.

220 http://raccoltanormativa.consiglio.regione.toscana.it/articolo?urndoc=urn:nir:regione.toscana:legge:1998-12-01;89

221 http://raccoltanormativa.consiglio.regione.toscana.it/articolo?urndoc=urn:nir:regione.toscana:regolamento.giunta:2014-01-08;2/R

16.4 Noise limits and targets

16.4.1 Objective and Scope

The Decree of the President of the Cabinet, 14 November 1997, "Determination of limits for noise sources," sets noise limit values for five categories of land use. Limit values include maximum emissions, as well as absolute noise release limit values (emissions) for all noise sources. Specific regulations are provided for road, rail, sea and aircraft noise.

The limit values are provided in the table below:

Table 163 Noise limit values

Categories of land use	Leq in dB			
	Noise emission limit values		Absolute limit values for release of noise (emissions)	
	daytime (06.00-22.00)	night (22.00-06.00)	daytime (06.00-22.00)	night (22.00-06.00)
I specially protected areas	45	35	50	40
II areas predominantly Residential	50	40	55	45
III areas of mixed type	55	45	60	50
IV areas of intense human activity	60	50	65	55
V areas predominantly Industrial	65	55	70	60
VI purely industrial areas	65	65	70	70
Quality areas	Limits defined by regional law			
Silence zones (*)	Limits defined by regional law			

** At present foreseen only in the legislation of the Tuscany region*

It is important to specify that according to the Italian legislation 447/1995, different type of noise value limits is considered:

1. Emission Values: the maximum value of noise that can be emitted from a noise source and measured nearby the source itself;
2. Limits of emission values: the maximum values of noise that can be emitted by one or more noise sources in living environment or outdoor, which is measured nearby the receptors. These values are categorised as follows:
    a. Absolute limits values;
    b. Differential limits values;
3. Attention values: noise values which indicates the presence of a potential risk of harming human health or the environment.
4. Quality values: noise values to be addressed in the short, medium and long period through technologies and methods available, in order to meet the objective of the current law.

Table 164 Noise limit values for land use categories in the domestic and outside environment in Italy[222]

Categories of land use	Leq in dB			
	Noise emission limit values		Absolute limit values for release of noise (emissions)	
	daytime (06.00-22.00)	night (22.00-06.00)	daytime (06.00-22.00)	night (22.00-06.00)
I specially protected areas	45	35	50	40
II areas predominantly Residential	50	40	55	45
III areas of mixed type	55	45	60	50
IV areas of intense human activity	60	50	65	55
V areas predominantly Industrial	65	55	70	60
VI purely industrial areas	65	65	70	70

Under Law No. 447 of 26 October 1995, Framework Law on Noise Pollution, the following general guidelines are given for managing noise releases from transport infrastructure:

- The maximum noise exposure and the areas to which they are applied (relevant noise bands) are set by specific implementation decrees and regulations
- Levels of noise pollution must be brought down to within the limits of the law defined by the decrees and regulations by preparing and rolling out the multi-year improvement plans;
- To carry out noise reduction and abatement works, since 1995 the owners and licensees of transport infrastructures have been obliged by law to allocate no less than 7% of their funds to infrastructure maintenance and improvements. This value is 2.5% in the case of roads that are state-owned (ANAS).

Presidential Decree No. 142 of 30 March 2004, "Provisions for the control and prevention of noise pollution caused by vehicular traffic" defines the limit values from road traffic. Limit values distinguish between the type of road, distance from the infrastructure (affected bands within which no account need be taken of the common noise zones), building type (residential, schools and hospitals) and period of exposure (day and night). For every building, the most critical point of the most exposed wall is considered; as an alternative to the limits of exposure assessed from outside, also the permissible limits inside the homes are considered. The limit values for road traffic are provided in the table below.

[222] Come esempio di classificazione acustica del territorio può essere consultato il sito della Regione Toscana all'indirizzo: http://www502.regione.toscana.it/geoscopio/inquinamentifisici.html

Similar dispositions regulating the railway traffic are defined by the **Presidential Decree No. 459 of 18/11/1998, "Regulation allowing the definition of regulation rules of the art. 11 of the law 26 October 1995, n. 447**, concerning noise pollution produced by railways traffic.

Airport noise must be evaluated following the Minister Decree of October 31, 1997. Three airport limit zones are defined around each airport area: A zone (no activities limitations); B zone (agricultural, livestock breeding, industrial, trading, tertiary and assimilated are allowed only if suitable noise reduction procedures are adopted); C zone (only activities due to the airport infrastructure are allowed). LVA values have not to exceed the following limits.

- A zone: 65dB(A);
- B zone: 75 dB(A);
- C zone: 75 dB(A);
- Outside A, B and C zone: 60 dB (A)[223].

Table 165 Noise limit values for road traffic in Italy (existing roads).

Road Types	Sub-types	Noise band breath (m)	Schools, hospitals, rest/nursing homes		Other receptors	
			Day dB	Night dB	Day dB	Night dB
A – motorway		100 – A	50	40	70	60
		150 – B			65	55
B – main out-of-town roads		100 – A	50	40	70	60
		150 – B			65	55
C – secondary out-of-town roads	Ca – dual carriageway	100 – A	50	40	70	60
		150 – B			65	55
	Cb – all secondary out-of-town roads	100 – A	50	40	70	60
		50 – B			65	55
D – urban fast roads/dual carriageways	Da – inter-district dual carriageway	100	50	40	70	60
	Db – all urban fast roads/dual carriageways	100	50	40	65	55
E – district urban		30	Defined by the municipality in accordance with the limit values under Presidential Decree No. 447 (see table 4.29)			
F – local		30				

Source: Autostrade per Italia - http://www.autostrade.it/en/risanamento-acustico/normativa-italiana.html

[223] Cotana, F. and Nicolini, A, 2004, "Noise mapping: The evolution of Italian and European Legislation," http://www.crbnet.it/File/Pubblicazioni/pdf/1148.pdf

16.4.2 Associated enforcement and mitigation measures

With regard to mitigating noise from transport infrastructure and enforcing limit values, ***Environment Ministry Decree of November 29, 2000, entitled "Criteria for drafting plans for the control and abatement of noise by companies and bodies that operate public transport services or related infrastructure"***[224] obliges operators to prepare and implement noise abatement plans. Plans must specify costs, priorities and work methods (barriers, road surfaces, any actions undertaken on individual receptors etc.) with related completion timescales. Operators identify priorities, taking into account the number of persons exposed and the difference between the current noise levels and the permissible limits. The Decree sets criteria for noise reduction activities, identifies the requirements of the models used to calculate the barriers' characteristics; and establishes criteria for assessing multiple sources to ensure that noise values remain below permissible values in cases when other sources of noise are present. Following approval of the plans by the Environment Ministry, improvement works must be completed within 15 years.

At the regional level, taking Tuscany as example, further regulation was implemented to secure an effective implementation of the national decree (11.09.2000) in accordance with the requirements set by END.

In Tuscany, the regional law n.39, August 2011, amends regional responsibilities concerning environmental noise, and recognise specific management functions to the regional authority and to other local authorities (i.e. provinces and municipalities) in the area of mobility and traffic. From 2011, Tuscany region is responsible to:

- Develop plans for the control and abatement of noise, as required by the decree 29/11/2000 for the roads owned by the region;
- Develop SNMs and NAPs for roads as specified by the legislative decree 194/2005 for the above roads.

In line with these regulations, Tuscany region delivered the following measures:

- Regeneration and improvement of road pavement thorough the instalment of soundproof asphalt. This road (SGC FIPILI) is 100 km long and it crosses the towns of Firenze, Pisa and Livorno.
- Regeneration of road pavement through the implementation of an experimental asphalt, which was tested through the project Leopoldo[225]. This is the regional road SR 435.

The Italian Rail Authorities (RFI) have implemented measures to contain and reduce rail noise, including the construction of noise barriers and infrastructure monitoring (such as assessing the steel girders of bridges)[226]. According to one of the interviewee, RFI, in compliance with the national legislation, installed approximately 400/500 km of acoustic barriers.

Italian legislation on noise from airports obliges the following procedures for monitoring and enforcement:

- Definition of anti-noise procedure for each airport which must be respected by airplanes during taking off and landing phases and during land operations;

[224] http://www.autostrade.it/en/risanamento-acustico/pdf/D-M-29-novembre-2000.pdf

[225] http://www301.regione.toscana.it/bancadati/atti/DettaglioAttiG.xml?codprat=2013DG00000000163

[226] RFI, 2009, http://www.rfi.it/cms/v/index.jsp?vgnextoid=13fd2ce4c155b110VgnVCM1000003f16f90aRCRD

- Continuous monitoring system of airport noise in order to guarantee the noise limits,
- Classification of the national airports on the basis of noise emissions;
- Economic sanctions in the case of exceedance;
- Obligation to adopt noise reduction measures in case of exceedance;
- Restrictions of night-time air traffic.

The lines of action outlined above are provided for under the following decrees:

- Decree 31/10/97 on Measurement methodology of airport noise;
- Decree n.496, 11th December 1997, on regulations for the reduction of acoustic pollution caused by civil aircrafts;
- Decree 20/5/99 which defines criteria for the design of monitoring systems for controlling acoustic pollution levels close to the airports and criteria for the airport classification related to the acoustic pollution level;
- Decree 3/12/99 regarding anti-noise measures and respect areas in the airports; and
- Decree n.476, 9th November 1999, on the ban of air traffic at night.

16.4.3 Implementation issues

According to the interview respondents, issues raised in Rounds 1 remained issues in R2. This is because the Directive is not easy to reconcile with the national regulation on noise. The latter set different noise indicators and foresees sets of actions that differ from those requested by the NAPs drawn up under the END. Even the timing of the actions is different. This means that the implementation of noise mitigation measures, as requested by the national legislation, and the NAPs requested by the Directive are not coordinated and create duplication.

Moreover, while the introduction of common noise indicator for different periods of the days (L_{den}, L_{night}) might have been beneficial for those countries without pre-existing noise mitigation measures in place, but for countries, such as Italy, the introduction of such indicators created difficulties of translation and integration, especially when previously defined indicators led to mitigation actions already in progress.

16.5 Quiet areas

Criteria used for the delimitation of quiet areas

Italian national legislation already provides for a certain number of acoustic and non-acoustic criteria for the delimitation of quiet areas (the Italian legislation refers to "areas in class I", "quality areas" and "silence zones". Only the latter corresponds to the END definition. These include, among other elements, the protection of areas around schools, hospitals, nursing homes and retirement homes. Natural parks and general protected areas are other types of quiet areas, as defined by the national legislation.

Methodologies employed

A common methodology was implemented at the national level based on the non-acoustic criteria noted above. However, with regard to END implementation, one interviewee indicated that CAs encountered difficulties in defining them since the European directive set criteria not coherent with the national regulation. The region Tuscany, through the regulation n. 2/R/2014, which implements the lr. 89/98, as amended in 2011, defined the appropriate criteria for individualising quiet areas within

its territory, integrating it with the national requirements[227]. With regard to R2, the agglomeration of Florence, supported by the region, implemented actions aimed at the protection of pilot quiet areas as defined by the LIFE+10/ENVIT407, QUADMAP.

16.5.1 Overview

At national level, quiet areas are defined by applying the "Class I" definition as foreseen by the municipal classification under the law 447/1995. This data is currently not available as reported by the national CA.

In the case of the Tuscany Region areas of "Class I" are 617 for a total of approximately 1591 km^2 and, within these, only one "quality area" has been identified which has an area of 2.61 Km^2.

The table below summarises the number and size of quiet areas established during Rounds 1 and 2 always in Tuscany Region.

Table 166 Quiet areas –Tuscany Region

	R1 *	R2 **
Number	551	552
Size (km^2)	4.29	4.84

** Florence. In Florence, for R1, the identification of quiet areas was done without implementing any particular criteria. The areas corresponded to schools, gardens and urban parks – which explains the high number.*

*** Florence, Livorno and Prato. In R2, the number of quiet areas for Florence remained the same as in R1. One quiet area was added for Prato, which fell into the scope of the END in R2 as an agglomeration. The definition of this quiet area followed the regional guidelines as established by the Regulation n. 2/R/2014. Livorno did not designate any quiet area but postponed it to the revision of their urban strategic plans.*

16.5.2 Implementation issues

Issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 167 Quiet area issues

Issue	Action
Lack of clarity and incoherence of criteria of definition of quiet zones between national and European directive. [228]	Between R1 and R2, the national/regional CA released guidance, which tried to address such inconsistency.

[227] See Chapter 7 of Good practice guide on quiet areas, EEA, Technical report No 4/2014 at: http://www.eea.europa.eu/publications/good-practice-guide-on-quiet-areas

[228] More specifically, according the Italian normative, the concept of quiet area, is applied in regard of areas that have a natural asset (i.e. parks and protected areas) or to those of which use is related to low noise level such as schools, hospitals and nursing and retirement houses. This concept is in conflict with what is foreseen by the END directive, which considers quiet area also urban zones (i.e. squares and urban parks).

16.6 Strategic noise mapping

16.6.1 Overview

An overview of SNMs produced at national level in Rounds 1 and 2 is shown below.

Table 168 SNMs – Italy (national level)

	R1	R2
Agglomerations	9	15 (29)
Major airports	9	9 (10)
Major railways	4	3 (3,457 km)
Major roads	28	29 (13,559 km)

Source: Italian Ministry of the Environment

Table 169 SNMs – Regional level (Tuscany region)

	Agglomerations	Major airports	Major railways	Major roads
R1	1	0	0	3
R2	3	0	0	55

16.6.2 Data collection

For the Tuscany region, data collection responsibility is defined by the lr. 89/98 as amended by the lr. 39/2011 and by the regulation that implement it n. 2/R/2014.

For the Tuscany region, methods are defined by the lr. 89/98 as amended by the lr. 39/2011 and by the regulation that implement it n. 2/R/2014.

16.6.3 Strategic noise mapping methods

Methodologies for Strategic noise mapping

RFI reported in the questionnaire that the detailed traffic data were derived from their database RIACE. The noise emission data were derived directly from RFI's database of noise measures. Geographic data were derived from RFI GIS and finally the number of people living in buildings has been pulled together from the latest ISTAT census.

The authority from Tuscany reports that data were obtained through GIS overlays. According to the Tuscany Region, national guidelines have been laid down for Strategic noise mapping. Indicators L_{den} and L_{night} have both been used in the preparation of the maps.

In particular, strategic mapping of regional roads network is based on the technical regional map. Traffic data for each route defined as main network, are extrapolated by other data measured by the regional department of viability. ARPAT defined the acoustic model for each route and calculated estimate of noise pollution level on the bases of the implementation guideline of END.

RFI reports that day and night L_{eq} have also been used to allow for the comparison with the limit values laid down in the national legislation. Both authorities believe revisions of the maps every five years to be appropriate. Similarly, to RFI, Tuscany region obtained the results by applying national and European indicators, and this criterion defined the conflict maps, and consequently the areas covered by the NAPs.

16.6.4 Public accessibility of SNMs

SNMs in Italy have been made available to the public via websites. Due to the decentralised, federalised structure, the approach has been regionalised with SNMs available via the GIS tool of Tuscany region[229].On the Tuscany region website SNMs for agglomerations and regional and provincial roads, are accessible together with the maps on the main national infrastructure (roads and railways) that cross the Tuscany regional territory.

For major roads, a webpage has been set to maps on the website of Autostrade per Italia.[230]

A number of issues were raised as a result of END implementation in R1 and 2, as summarised in the following table:

Table 170 Strategic noise mapping issues

R1	R2
Problems with estimating the number of dwellings exposed to noise. One of the reasons was that land planning maps were too old and there is no census of the number of inhabitants per building. Furthermore, difficulties were reported regarding the estimations of the number of exposed facades of buildings. These difficulties were partially overcome through calculations using the volume of buildings. Significant costs in the production of SNMs in R1.	For what concerns noise strategic maps of agglomerations in Tuscany, difficulties emerged because of the overlap in responsibilities. According the current Italian legislation, each managing authority of major infrastructure has to provide to the agglomeration CA the SNM showing the related noise rate adding up to total noise pollution level in the agglomeration. Such contribution has to be added up to the infrastructure that are of competence of the agglomeration. Therefore, it is clear that there is a lack of direction and instructions on how to calculate and provide data, in order to aggregate data properly. As result, maps so far produced can only be approximated. The issue stemmed in R2 since R1 did not require a total strategic map but a map concerning individual noise source, (i.e. roads, railways, airport, and industry). In R2, securing the funding necessary to implement the directive is considered one of the major obstacle to comply with the directive. In R2 the costs to implement the directive significantly increased, taking into account the fact that from R1 to R2, the number of bodies involved in went from 2 (Region and the Florence municipality) to 10 (Municipalities of Florence, Livorno and Prato, Region and Provinces of Firenze, Livorno, Lucca, Pisa, Pistoia and Siena).

[229] Noise Maps GIS tool. http://www502.regione.toscana.it/geoscopio/inquinamentifisici.html

[230] The webpage is: http://www.autostrade.it/it/la-nostra-rete/risanamento-acustico/normativa-europea/mappatura-del-rumore . Further information about acoustic http://www.autostrade.it/it/la-nostra-rete/risanamento-acustico

16.7 Noise action planning

16.7.1 Overview

An overview of NAPs at the national level is shown in the following table.

Table 171 NAPs –Italy (national level)

	R1	R2
Agglomerations	7	11
Major airports	9	18
Major railways	4	5
Major roads	28	43

Source: ISPRA Report[231]

16.7.2 Methodologies for noise action planning

For the Tuscany region, methods are defined by the lr. 89/98 as amended by the lr. 39/2011 and by the regulation that implement it n. 2/R/2014.

16.7.3 Measures

For the Tuscany region, methods are defined by the lr. 89/98 as amended by the lr. 39/2011 and by the regulation that implement it n. 2/R/2014. The measures identified with the NAPs coincide with those defined with the municipal plans for acoustic regeneration as established by art. 7 of the law 447/1995 and by the plans of containment and abatement of noise by transport infrastructure (DM 29/11/2000).

16.7.4 Public consultations

In the Tuscany region, Competent Authorities conducted two series of public consultation.

The first consultation, as foreseen by art.8 of the legislative decree 194/2005, was implemented in two phases. Phase 1 started on 1st July 2013, when the regional authority held a meeting with all stakeholders of regional infrastructures addressed in NAPs. During this meeting results of the SNM were presented together with the theoretical and methodological framework used to develop the NAP. Moreover, on 24th July 2013, the regional authority published on the official Tuscany Region Bulletin, informing all citizens and bodies interested in the development of the NAP of the consultation actions and on the different ways to submit comments. The NAP was made available on the regional authority website as well as for the purpose of consultation in each of the 'public relation' contact points at regional level.

Neither of these consultation actions did receive any comments.

Phase 2 started on 28 June 2013 with the implementation of an Environmental and Strategic Evaluation procedure as foreseen by the national and regional legislation. In this context, some interested municipalities submitted relevant documentation, which contributed to the overall development of the NAP.

[231] Silvaggio (2011) Stato di Attuazione Direttiva END – ISPRA Report.

16.7.5 Implementation issues

Issues were raised as a result of END implementation in R1 and R2. These, together with actions taken to address them, are shown in the table below.

Table 172 Noise action planning issues

Issue	Action
Most interviewees agree that some designated CAs had trouble on how to access data and how to use them in the elaboration of the NAP. These are due to lack of technical knowledge and of resources.	Minor improvements could be seen in R2 thanks to the support given by the national CA through guidance on how to implement the directive.
The Ministry of Environment indicated that issues with NAPs occurred especially with agglomerations. Especially due to the territorial extension happening in R2. This increased the difficulty of managing and aggregating the amount of data, which often were double or not coherent.	Adjustments to the guidelines, which were approved in order to harmonise the approaches and make data provided by all subjects compatible.
Need for coordination of the tasks in preparation for the deadlines and the realisation of the regeneration interventions foreseen by the national legislation and by the European directive for agglomeration and infrastructures.	Update of the national legislation framework.

17. LATVIA

17.1 National implementing legislation for END

17.1.1 Legal implementation

In Latvia, the END was transposed through the Law on Pollution and Regulations No 16 "Procedures for Noise Assessment and Management adopted 7 January 2014 (which replaced the Regulation of Cabinet of Ministers No 597, "Procedures for Environmental Noise Assessment and Management" adopted on 13th July 2004). There have subsequently been a number of amending regulations. These Regulations set noise indicators, methods of assessment, noise limit values, requirements for the strategic noise maps and actions plans and requirements for public information.

These Regulations cover not only environmental noise but also community noise (noise from domestic activities, noise nuisance from neighbours etc.) and indoor noise from domestic appliances

Further relevant legislation includes the Law on Pollution 20 June 2002, which has been amended several times in the previous decade. The relevant noise-related legal provisions were adopted on 7 May 2009 and came into force on 1 August 2009. Section 18.1 of the Law relates to the Assessment and Reduction of Noise [10 December 2009]. The law states that strategic noise mapping and noise action planning for noise reduction in agglomerations shall be ensured by the relevant local government. If in the territory of the agglomeration, there are several local municipalities, these must co-operate in carrying out strategic noise mapping and in the development of NAPs. The Ministry of Transport is responsible for the development and implementation of SNMs and NAPs for the reduction of noise in relation to roads and railways, as well as airports for which the traffic intensity is more than 50,000 aircraft movements per year.

17.1.2 Scope of END implementation – Rounds 1 & 2

The scope of END implementation at national level is now examined. In R1 in Latvia, SNMs only had to be developed for the Riga agglomeration and for 5 motorways with a traffic intensity of more than 6 million vehicles per year (35 km). The mapping of roads located within the Riga agglomeration was required. There were no major railways and major airports in Latvia falling within the Directive's scope (R1).

During R2, the introduction of thresholds led to an extension in mapping activities, with approximately 192 km of major roads being mapped overall. There were some major railways and one major airport Riga in R2. With regard to agglomerations, in R2, given that a very high proportion of the population lives in Riga, there was only one agglomeration in Latvia – Riga City.

Table 173 – END coverage – Latvia

Round	Agglomerations	Major airports	Major rail	Major roads
1	1	0	0 km	35 km
2	1	0	80 km	192 km

The above table relates to the numbers of NAPs (and in the case of major rail and roads to the volume of mapping in kms) that were due to be reported. However, it was noted during the interview programme that the Latvian authorities decided not to repeat noise mapping in respect of major roads in some instances because having

reviewed the pre-existing noise map from 5 years earlier, they determined that based on traffic data, it was not necessary to undertake remapping.

Within the framework of the revision of noise mapping, the number of people significantly affected by potentially harmful effects of noise was updated.

17.2 Competent Authorities and designated administrative bodies

The Ministry of Environmental Protection and Regional Development is the overall responsible competent authority ("CA") for END implementation in Latvia. The Latvian Environmental, Geological and Meteorological Centre is responsible for the collection and storage of SNMs and NAPs in both R1 and R2 and for informing the public as to who is the responsible CA for different aspects of END implementation. A summary of the division of responsibilities for the development and approval of SNMs and NAPs is provided in the following table:

Table 174 Administrative Responsibility for the END – Latvia

Role/Activity	Agglomerations	Roads	Railways	Airports
Data collection	The Ministry of Transport	The Ministry of Transport	The Ministry of Transport	The Ministry of Transport
Preparing SNMs	Riga City Council and a series of local authorities[232] Riga City Council[233]	State Joint Stock Company Latvian State Roads	State Joint Stock Company "Latvijas dzelzceļš"	State Joint Stock Company Riga International Airport of the Republic of Latvia
EC/EEA reporting	Ministry of Environmental Protection and Regional Development (national CA) State Limited Liability Company "Latvian Environment, Geology and Meteorology Centre"			

** Data collection only*

As noted in the section on the legal context, local authorities have an important role in strategic noise mapping and noise action planning. In addition, the Law on Pollution (as amended in 2009) states that the development and implementation of noise mapping, and the production of SNMs and NAPs for the reduction of noise in relation to roads and railways, as well as airports in which the traffic intensity is more than 50000 aircraft per year are under the responsibility of the Ministry of Transport.

17.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

17.3.1 Data collection

Data has been gathered in vector file format, attached to a national coordinate system. Manual data input was also applied. Directive 2002/49/EC interim methods were used for the calculation of noise. Noise measurement methods recommended in the END were applied for Riga agglomeration (for data validation).

[232] Round 1 - Riga City Council, Baloži City Council, Babīte Community Council, Garkalne Community Council, Mārupe Community Council, Olaine Community Council, Stopiņi Community Council, Salaspils City and Rural Territory Council, Jūrmala City Council.

[233] R2 – Riga Agglomeration covers only Riga City

17.3.2 Implementation issues

The main issues raised relating to END implementation in R1 and 2 relating to designation and delimitation are shown in the table below:

Table 175 Designation issues - Latvia

Issues – R1	Issues – R2
The Latvian authorities indicated some difficulties in interpreting the term 'agglomeration' in the END. Directive 2008/50/EC on ambient air quality and cleaner air for Europe uses a different definition of agglomeration. It would be helpful to align the definitions.	The division of responsibilities for strategic noise mapping for major railways within agglomerations between the municipal authority (Riga city council) and the national railway authority (State Joint Stock Company "Latvijas dzelzceļš"). The interpretation in the new legislation of 'quiet area in an agglomeration' has been replaced by 'quiet area in a populated place'. Another key term in the END 'annoyance' has been replaced by 'discomfort'.

17.4 Noise limits and targets

17.4.1 Objectives and scope

The noise limit values that applied in R1 were set out in Regulation No. 597 "Procedures for Environmental Noise Assessment and Management" from 2004. However, this law was repealed in 2014 and Latvia adopted a revised set of LVs, as set out in the following table:

In R2, the new Regulations of the Cabinet of Ministers No 16 "Procedures for Environmental Noise Assessment and Management" was adopted on 7 January 2014. These have been in force since 24 January 2014, and the following noise limit values now apply:

Table 176 Limit values for noise – Latvia

	L_{den}	L_{day}	$L_{even-ing}$	L_{night}	Explanations about their implementation
Building territory of individual (private houses, low-storey or farmsteads) residential houses, institutions for children, medical treatment, health and social care institutions	-	55	50	45	1) Regulations of Cabinet of Ministers No 16, "Procedures for Environmental Noise Assessment and Management" on 7 January 2014.
Building territory of multi-storey residential houses	-	60	55	50	2) Limit values for road-traffic noise; rail-traffic noise; aircraft noise around airports; noise on industrial activity sites.
Public building territory (territory of public and administration objects, including the territory of cultural institutions, educational and scientific institutions, State and local government administration institutions and hotels) (also residential building)	-	60	55	55	3) The limit values cover all the country with respect to certain residential and public areas regardless of particular source of noise.
Mixed building territory,	-	65	60	55	4) In protective zones

	L_{den}	L_{day}	$L_{even-ing}$	L_{night}	Explanations about their implementation
including the territory of trade and service buildings (also residential building)					along motor roads (including along motor roads where the traffic intensity is less than 3 million vehicles per year), in protective zones along railways and in territories that are located closer than 30 m from stationary noise sources the limit values for environmental noise shall be considered to be target values.
Quiet areas in populated areas (including in agglomerations)		50	45	40	

A key difference in the new legislation is that there are now noise limit values for quiet areas in populated areas (including in agglomerations).

Methods for establishing noise limit values

Experience and information about noise limits established in other EU countries and historical limits in Latvia was used to inform the establishment of noise limit values in Latvia (see the Regulation of the Cabinet of Ministers No. 597 "Procedures for Environmental Noise Assessment and Management" on 13 July 2004).

For the time being in Latvia, there are no stated limits of the L_{den} indicator for practical use due to difficulties in the assessment (including measurements) of such a noise characteristic. Strategic noise mapping is carried out for noise indicators (L_{night}, L_{day}, $L_{evening}$) and also the exceedance of the limit values for these noise indicators. These LVs have subsequently been revised and amended in 2014 (Regulations of Cabinet of Ministers No 16 "Procedures for Environmental Noise Assessment and Management" on 7 January 2014). According to the Regulations, the limit value for noise is the permissible value of a noise indicator upon the exceeding of which a relevant authority considers the possibility of taking measures or takes measures that reduce the limit value for noise.

The exceeding of noise limits has been used as the basis for establishing priorities in the NAPs.

17.4.2 Implementation issues

No issues were raised as a result of END implementation in R1 and R2 in relation to LVs.

17.5 Quiet areas

17.5.1 Overview

The table below summarises the number and size of quiet areas established during Rounds 1 and 2.

Table 177 Quiet areas – Latvia

	R1	R2[234]
Number	36	Not yet
Size (km^2)	11 928	Not yet

In Latvia, local government is responsible for the determination of quiet areas in an agglomeration where the value of the noise indicator for any noise source is lower than the limit value for noise for the delimitation of quiet areas.

Since 2014 taking account Regulations of Cabinet of Ministers No 16, "Procedures for Environmental Noise Assessment and Management" on 7 January 2014:

- A quiet area in a populated area (agglomeration too) – a territory in a populated area, where the limit value for noise is lower than the limit values for noise indicators – L_{night} 40 db(A), $L_{evening}$ 45 db(A) and L_{day} 50 db(A)
- A quiet area in a rural district – a territory in a rural district that is free of noise caused by traffic, industrial activity or recreational activities, and where the limit value for noise is lower than the limit values for noise specified in Annex 2 to Regulations of Cabinet of Ministers No 16, "Procedures for Environmental Noise Assessment and Management" on 7 January 2014.

One stakeholder argued that the legislative changes that were made mean that the definition of a quiet area in an agglomeration is not incorporated correctly into the new legislation due to the focus on quiet areas in a populated area but the Competent Authority stated that this concept also incorporates quiet areas within agglomerations.

Methodologies employed

Specific guidelines were not developed for the determination of quiet areas. However, criteria for the determination of quiet areas are included in the 2014 Regulation and the Latvian CAs make use of the EU guidelines "Definition, Identification and Preservation of Urban & Rural Quiet Areas", Final report, SYMONDS, 2003 (European Union Service Contract ENV, C 1/SER/2002/0104R) and the UK guidelines "Research into Quite areas, Recommendations for identification", DEFRA, 2006.

In R1, taking into account these criteria, quiet areas were determined for the Riga agglomeration, mainly public, recreational areas, areas of greenery and forest territories in which the Lday value is under 55 dB(A) and in areas above 9 hectares.

[234] Noise action plan for Riga agglomeration have not prepared yet (Round 2).

17.5.2 Implementation issues

During Rounds 1 and 2, the main implementation issues that have emerged during END implementation are shown in the table below.

Table 178 Quiet area issues – Latvia

R1	R2
Not clear how the definition of a quiet area would be determined in Latvia.	In the 2014 consolidated Regulations, the definition of quiet areas in Latvia legislation has changed from 'quiet area in an agglomeration' to 'quiet area in a populated place'. Some stakeholders stated that this was too narrow a definition. Not clear how to implement quiet areas in a rural district, taking into account there are not many major noise sources outside the Riga agglomeration. Taking into account the definition of a quiet area, there are only small areas within the Riga agglomeration in which noise indicator values are under the specified noise limits and would meet the definition of a quiet area.

In Latvia, with the exception of some parts of the Riga agglomeration, there are not many major noise sources which have harmful effects on humans. This reflects the relatively small population. There are also large rural areas and areas covered by forest in which there are no noise sources and noise levels are low.

For the preservation of areas where the quality of sound is good, local authorities identify residential areas and/ or recreational areas in the local government spatial plans and also specify the requirements which help to protect residents from high levels of noise.

17.6 Strategic Noise Mapping

17.6.1 Overview

An overview of the number of SNMs produced in Rounds 1 and 2 is shown below.

Table 179 SNMs – Latvia

	R1	R2
Agglomerations	1	1
Major airports	n/a	1
Major railways	n/a	3 (80 km)
Major roads	5	15[235] (192 km)

[235] Strategic noise maps which were produced in 2007 were reviewed in 2012 but the maps have not been revised. There was an update for the population numbers only.

It should be noted that there weren`t any major airports and major railways in R1 in Latvia. Rather, in R1 and R2, Riga was the only agglomeration. It is not possible to define the number of SNMs specifically produced in relation to the END because in Latvia, for every major noise source, several SNMs were produced because strategic noise mapping is driven not only by the requirements of the END, but also by national legislation:

1. Exceedances of the limit values for noise (L_{night}, $L_{evening}$ and L_{day}). This means that 3 maps are needed for each noise source;

2. The number of people living outside agglomerations in dwellings into the following zones:

    a. For L_{den}: 55–59, 60–64, 65–69, 70–74, > 75 db(A);

    b. For L_{night}: 50–54, 55–59, 60–64, 65–69, > 70 dB(A);

3. The number of people, in conformity with Point 2, who live in dwellings with special sound insulation and dwellings with a quiet façade (if the relevant data are available);

4. The total area (km^2) that is exposed to noise at values of the noise indicator L_{den} greater than 55, 65 and 75 dB(A), respectively. The number of dwellings and the number of people living in each of the areas referred to shall also be indicated, including agglomerations.

<u>For Riga agglomeration several maps were produced:</u>

1. Noise sources (road traffic, railway traffic, airports and industrial activity zones) – separately maps and common map for each noise indicators (L_{night}, $L_{evening}$ and L_{day});

2. Exceedances of the limit values for noise;

3. The number of people living in dwellings into the following zones:

    a. For the noise indicator L_{den}: 55–59, 60–64, 65–69, 70–74, > 75 db(A);

    b. For the noise indicator L_{night}: 50–54, 55–59, 60–64, 65–69, > 70 db(A);

4. Information on how the people living in the zones referred to in Point 3 are affected by noise caused by road traffic, railway traffic and air traffic, as well as by noise sources from industrial activity;

5. The number of people, in conformity with Point 3, who live in dwellings with special sound insulation and dwellings with a quiet façade and the effect of noise caused by major roads, railway lines and airports therein (if the relevant data are available).

17.6.2 Data collection

Data are collected by different local and state institutions which are responsible for data collection. The State Limited Liability Company "Latvian Environment, Geology and Meteorology Centre" has been responsible for the collection of SNMs and NAPs in both Rounds 1 and 2.

There are several institutions which are **responsible for data collection**:

- Topographical maps and digital terrain models - Latvian Geospatial Information Agency;
- Address register, houses, topographical information – State Land Service, local authorities;
- Data about inhabitants - Office of Citizenship and Migration Affairs (register), local authorities and Central Statistical Bureau;
- Information about traffic (including traffic intensity);
  - Road traffic - State Joint Stock Company Latvian State Roads and local authorities (local roads and streets);
  - Railway traffic – State Joint Stock Company "Latvijas dzelzceļš", trams – local authorities;
  - Air traffic – State Joint Stock Company Riga International Airport of the Republic of Latvia and Civil Aviation Agency
- Industrial objects – information from pollution permits.

In R1, there was a lack of input data to prepare the SNMs. Where information was available, this was often of insufficient quality. In R2, the situation was easier because there was greater experience in strategic noise mapping and noise action planning.

17.6.3 Strategic noise mapping methods

There is no guidance in Latvia at either national, regional or local level for strategic noise mapping. Both L_{night} and L_{den} were used for strategic noise mapping. In addition, the indicators L_{day} and $L_{evening}$ were used.

The following guidance was used: '2007 Good Practice Guide for Strategic Noise Mapping and the Production of Associated Data on Noise Exposure', 'Presenting Strategic noise mapping Information to the Public', 'IMAGINE – State of the Art', 'Environmental Noise Data Reporting Mechanism Handbook (2007)', and 'Report Network Delivery Guide'.

Interim computation methods for L_{den}, L_{night}, L_{day}, $L_{evening}$ were used:

- For INDUSTRIAL NOISE: ISO 9613-2: "Acoustics - Abatement of sound propagation outdoors, Part 2: General method of calculation".
- For AIRCRAFT NOISE: ECAC.CEAC Doc. 29 "Report on Standard Method of Computing Noise Contours around Civil Airports", 1997.
- For ROAD TRAFFIC NOISE: The French national computation method "NMPB-Routes-96 (SETRA-CERTU-LCPC-CSTB)", referred to in "Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6" and in the French standard "XPS 31-133".
- For RAILWAY NOISE: The Netherlands national computation method published in "Reken- en Meetvoorschrift Railverkeerslawaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996".

An EU funded LIFE project has been undertaken in Latvia. "Innovative Solutions for Railway Noise Management (ISRNM) has been undertaken to explore the possibility of using the Dutch RMR method in mapping rail noise[236].

17.6.4 Public accessibility

The SNMs are available for the public at those local governments that are included in the Riga agglomeration and at the Ministry of Transport. The maps can be downloaded from the Riga City Council and Ministry of Transport websites - see www.riga.lv and www.sam.gov.lv. The map for Riga airport is also available online[237].

17.6.5 Implementation issues

A number of issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 180 Strategic noise mapping issues - Latvia

Issues – R1	Issues – R2
There were problems in obtaining data for SNMs. Data was gathered in vector file format and manually. There were problems in obtaining appropriate data on inhabitants, traffic intensities, and industrial objects. Harmonised EU level methods for SNMs would be preferable. There should be more time allowed for SNMs (SNMs) to be produced. There is no experience with the noise calculation methods mentioned in the END and the software is not available in Latvia. The lack of experience in the field of developing SNMs was a problem. Finding budget to fund the development of SNMs was a problem.	Harmonised EU level methods for the development of SNMs would be preferable. Identifying budget to fund the development of SNMs was a problem for Riga agglomeration. The Latvian road authorities did not repeat the mapping of roads from R1 because SNMs were reviewed and a decision was taken that SNMs did not need to be revised since there were no major changes between rounds based on a review of traffic intensity data.

17.7 Noise action planning

17.7.1 Overview

An overview of NAPs that were produced in Latvia and submitted to the Commission is shown in the following table.

Table 181 NAPs – Latvia

	R1	R2
Agglomerations	1	1[238]

[236] http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=422

[237] http://www.riga-airport.com/uploads/files/Par%20lidostu/Vide/Troksna_strategiska_karte_maza.pdf

[238] Noise action plan for Riga agglomeration have not prepared yet (Round 2).

Major airports	0	1
Major railways	0	1
Major roads	5	9

17.7.2 Methodologies for noise action planning

In R1, the SNMs in 2006 were used as a basis for developing NAPs in 2008. The exceedance of noise limit values was used to establish priorities for NAPs. In addition, the 'noise score index' by W. Probst (Accon) was applied to establish priorities for NAPs. Furthermore, municipality development plans were taken into account.

In R2, there were updates to the SNMs in 2012 (which was not the case for all roads), these were then used as the basis for determining Noise action planning priorities.

17.7.3 Measures

Examples of noise abatement measures included in NAPs in Latvia include traffic planning, land-use planning, technical measures at noise source, economic measures, insulation, regulation, and incentives.

17.7.4 Public consultations

In Latvia, public consultations on NAPs are required to take place under the Regulations of the Cabinet of Ministers of Republic of Latvia Nr. 597 (13.07.2004) and Regulations of Cabinet of Ministers No 16 "Procedures for Environmental Noise Assessment and Management," which was enacted on 7 January 2014. The new Regulations replace the "Procedures for Environmental Noise Assessment and Management".

In both R1 and 2, public hearings took place. Inhabitants were interested in proposed noise reduction measures already in the NAPs and wanted these implemented as quickly as possible. However, there is a lack of budget to implement most measures identified in NAPs.

17.7.5 Implementation issues

The main issues raised as a result of END implementation in Rounds 1 and 2 are shown in the table below.

Table 182 Noise action planning issues - Latvia

R1	R2
More time needed to develop NAPs.	More time needed to develop NAPs.
A common method to identify areas that are noise hotspots and need to be prioritised would be desirable.	A common method at EU level to identify areas that are noise hotspots and need to be prioritised would be desirable.
A lack of sufficient availability and quality of input information e.g. on the number of inhabitants, the lack of information in vector file format.	Limited budget to actually implement noise abatement measures.
Incomplete information on planned measures identified in NAPs.	
Limited budget to actually implement noise abatement measures.	

18. LITHUANIA

18.1 National implementing legislation for END

18.1.1 Legal implementation

The Law on Noise Management of 26th October 2004 (No. IX-2499) (Official Gazette, 2004, No. 164-5971)[239] is the main act transposing the END into national legislation, and sets out the framework for additional implementing acts to ensure its full transposition and implementation.

Governmental decision of No. 581 of 14th July 2006 on the adoption of a National Strategic noise mapping Programme (Official Gazette, 2006, No. 68-2508)[240] sets out the main requirements, responsibilities and funding for carrying out Strategic noise mapping. The NAP for 2006–2007 of the National Strategic noise mapping Programme (adopted through Governmental decision Nr. 581 of 2006) was prepared to ensure the implementation of the R1 Strategic noise mapping obligations. A follow-up NAP for the 2008–2012 period for the National Strategic noise mapping Programme (adopted by Governmental Decision No. 716 of 2008) (Official Gazette, 2008, No. 84-3356)[241] was prepared to implement the R2 strategic noise mapping obligations.

Governmental decision Nr. 564 of 2007 on the adoption of the National Noise Prevention Action Programme for Year 2007–2013 (Official Gazette, 2007, No. 67-2614)[242] set out a framework for implementing noise-reduction measures for governmental institutions and proposed some measures and preliminary budget for Noise action planning to local municipalities in Round 1. The Round 2 NAP – the National Noise Prevention Action Programme for Year 2007–2013 – for the 2009–2013 period (adopted by the Governmental decision Nr. 157 of 2009) (Official Gazette, 2009, No. 28-1087)[243] was prepared to ensure implementation of the R2 Noise action planning. .

The requirements in Annex I and II of the END on noise indicators and strategic noise mapping methods were transposed through Order No. V-604 of 2011 of the Minister of Health on the adoption of the Hygiene Regulation HN 33:2011: "Noise Limit Values in Residential and Public Buildings and in Their Environment" (Official Gazette, 2011, No. 75-3634)[244].

EU reporting obligations are defined in the 2005 Order No. V-787/D1-507/3-467 by the Minister of Health, Minister of Environment and Minister of Transport and Communications on the adoption of Rules of the Reporting to the European Commission on the Implementation of the Requirements of European Union Noise Management Legal Acts (Official Gazette, 2005, No. 128-4621)[245].

The forms to be used by Strategic noise mapping and Noise action planning authorities to submit Strategic noise mapping and Noise action planning reports to the national CA responsible for reporting to the EC were adopted through Order No. V-616 of 2007 of the Minister of Health (Official Gazette, 2007, No. 83-3406)[246].

[239] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=454086
[240] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=278272
[241] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=325017
[242] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=299788
[243] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=338869
[244] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=402074
[245] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=264739
[246] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=302384

The Noise Prevention Council[247] is an inter-institutional body that is responsible for ensuring coordination on environmental noise in Lithuania. This consists of representatives from different government Ministries, sectors, NGOs and research institutions. EU funded project PRONET (Pollution Reduction Options NETwork) found Noise Prevention Council as a good example of administrative / political Instruments[248]. The Council has been operating for a number of years and was regarded as functioning quite effectively, although it has met more infrequently in the previous couple of years.

18.1.2 Scope of END implementation – Rounds 1 & 2

R1 of Strategic noise mapping and Noise action planning in Lithuania included 2 agglomerations and approximately 166 km of major roads. There was no major airport nor major railways. The introduciont of definitive thresholds in R2 led to an additional 3 agglomerations, 76 km of major railway lines and 819 km of major roads falling within the scope of the END, as summarised in the following table.

Table 183 END coverage – Lithuania

Round	Agglomerations	Major airports	Major rail	Major roads
1	2[249]	n/a	n/a	166 km[250]
2	5[251]	n/a	76 km	819 km

Source: Country fiches. European Commission, Rp DF4 8 2012 ANNEX countries ETCSIA Review 130828 with WM. data flow 4_8, due in December 2012

18.2 Competent Authorities and designated administrative bodies

The CA for R1 collection and reporting was the former State Environmental Health Centre, but since 2012, has been the responsibility of the Ministry of Health of the Republic of Lithuania. The Ministry is responsible for the collection and reporting of data related to SNMs and NAPs to the European Commission/ EEA. The organisations responsible for the production and approval of SNMs and NAPs in Lithuania are shown in the table below.

Table 184 Administrative Responsibility for the END - Lithuania

Role/Activity	Agglomerations (including major roads sections within agglomerations)	Roads	Railways	Airports
Preparing SNMs	Municipality Administration and Council[252]	Lithuanian Road Administration (Ministry of Transport and	State Railway Inspectorate (Ministry of Transport and	Civil Aviation Administration
Approving SNMs				

[247] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=477834

[248] http://www.sam.lt/get_file_short.php?TPT_pronet

[249] Vilnius, Kaunas

[250] 123 km out of which are outside agglomerations (http://cdr.eionet.europa.eu/lt/eu/noise/cols_fbjw/envs_fcjw/)

[251] Vilnius, Kaunas, Klaipeda, Šiauliai and Panevežys

[252] Vilnius, Kaunas, Klaipeda, Siauliai, Panevėžys

Role/Activity	Agglomerations (including major roads sections within agglomerations)	Roads	Railways	Airports
Preparing NAPs		Communications)	Communications)	
Approving NAPs		Municipality Administration and Council[253]		
EC/EEA reporting	Ministry of Health			

18.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

18.3.1 Data collection

The Law on Noise Management of the Republic of Lithuania transposes the END's definitions of agglomerations, major roads, major railways and major airports. Agglomeration borders are aligned with the administrative borders of cities with more than 100,000 inhabitants. The number of inhabitants for each city is publicly available from Statistics Lithuania[254].

Data to delimit major roads, major railways and major airports are available from the Lithuanian Road Administration, State Railway Inspectorate and Civil Aviation Administration (governmental institutions under the Ministry of Transport and Communications of the Republic of Lithuania) respectively.

18.3.2 Implementation issues

There were some problems defining institutional responsibilities for major road and major railway sections and major airports within agglomerations. This was because administrative responsibilities vary depending on the specific section of road or rail within an agglomeration concerned. This has however now been resolved through dialogue between the different administrative responsibilities concerned. During R1 and R2 Strategic noise mapping and Noise action planning responsibility issues were solved through informal agreement. However, the division of responsibility between different organisations has yet to be legally formalised.

18.4 Noise limits and targets

18.4.1 Objectives and scope

The purpose of setting noise limit values is to avoid noise nuisance and to protect human health and well-being.

According to the definition of noise limit value, provided in the article 2 of the Law on Noise Management, noise limit value – value of L_{day}, $L_{evening}$, L_{night}, above which noise source holder must take actions to eliminate or reduce noise.

Article 14 (duties and rights of noise source holders) of the Law on Noise Management states, that noise source holders must comply with the noise limit values and ensure that the emitted noise does not exceed the noise limit values set to certain areas.

[253] Vilnius, Kaunas, Klaipeda, Siauliai, Panevėžys

[254] http://www.stat.gov.lt

Noise limit values were adopted by Order No. V-604 of 2011 of the Minister of Health on the adoption of Hygiene Regulation HN 33:2011 "Noise Limit Values in Residential and Public Buildings and in Their Environment"[255]

Noise limit values are set for:

- Day (06.00-18.00), evening (18.00-22.00) and night (22.00-06.00)
- L_{day}, $L_{evening}$, L_{night} and L_{den} used for evaluation of Strategic noise mapping results.

Noise limit values have been determined largely based on experience obtained through implementation and on the basis of complaints made by the public.

Table 185 Residential and public buildings - Noise limit values dB(A) - Lithuania

	L_{den},	L_{day}	$L_{evening}$	L_{night}
Transportation noise	65	65	60	55
Industrial noise	55	55	50	45

Source: Hygiene Regulation HN 33:2011 "Noise Limit Values in Residential and Public Buildings and in Their Environment"[256]

18.5 Quiet areas

18.5.1 Overview

The END definitions of "quiet area in an agglomeration" and of a "quiet area in open country" were transposed into national legislation by the Law on Noise Management, which also defines the additional concept of a "quiet public area". Designated quiet areas are delimited on the basis of decisions made by relevant municipal authorities. For example, quiet areas within the agglomeration of Vilnius city municipality are delimited by city Council Decision No. 1-341 of 2011, in Kaunas city municipality (Council Decision No. T-546 of 2007), and in Klaipėda city municipality (city Council Decision No. T1-159 of 2013).

Table 186 Scope of delimited quiet areas – Lithuania, 2015

Quiet area type	Coverage
Quiet agglomeration areas	3 out of 4 agglomerations
Quiet rural areas	39 of 60 municipalities
Quiet public areas	55 out of 60 municipalities

Source: Ministry of Health, 2015 Report by Noise Prevention Council on the Noise Management in Lithuania in 2012–2013[257]

L_{den} is the main criterion used for the delimitation of quiet areas in agglomerations.

Other criteria include a categorisation of the immediate vicinity of noise sources and the expectation of quietness.

[255] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=402074

[256] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=402074

[257] http://sam.lt

There is no common detailed methodology set out in legislation for delimiting quiet areas. However, non-binding guidelines were prepared in 2008 by the State Environmental Health Centre (which as noted earlier was formerly the national CA).

Updated guidelines for delimiting quiet areas were incorporated into the non-binding Exemplary Model for the Organization and Implementation of Environmental Noise Prevention in 2012.

18.5.2 Implementation issues

No issues were raised as a result of END implementation in R1 in the 2011 implementation report. However, a number of issues were raised in both Rounds.

Table 187 Quiet area issues - Lithuania

R1	R2
There was no common methodology for defining quiet areas in Lithuania.	The EEA is seeking to collect spatial data on the location of quiet areas, but since there is no formal requirement to do so in the END and there are no formal reporting obligations, this is on a voluntary basis.
However, criteria were developed to help to define quiet areas. These included the categorisation of the immediate vicinity of noise sources and the expectation of quietness.	It is difficult to oblige small municipalities (who are not familiar with the END) to digitise the locations of delimited quiet areas.

18.6 Strategic noise mapping

18.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 188 SNMs - Lithuania

	R1	R2
Agglomerations	2	4[258] (5)
Major airports	n/a	n/a
Major railways	n/a	1 (1) (76 km)
Major roads	1	1 (1) (819 km)

[258] Kaunas city agglomeration (2nd by size Lithuanian agglomeration) failed to adopt strategic noise maps or information is not publicly available

Strategic noise mapping in agglomerations was prepared by 5 different municipalities in R2 compared with only 2 in R1. Strategic noise mapping (and Noise action planning) of major railways was carried out by a single organisation, the State Railway Inspectorate. This information was then shared with the relevant city municipalities. For example, there are major railway sections inside Vilnius agglomeration and outside of the Vilnius agglomeration. Noise affected population data from Strategic noise mapping of major railways were included in the spreadsheet for Strategic noise mapping of major railways and into the spreadsheet of Strategic noise mapping of Vilnius agglomeration as required by EC/EEA reporting mechanism.

Strategic noise mapping (and noise action planning) of major roads was more complex because it was undertaken by different CAs. At the national level, the Lithuanian Road Administration prepared SNMs and NAPs for major road sections outside agglomerations. Vilnius, Kaunas, Klaipėda, Šiauliai and Panevėžys agglomerations prepared SNMs of major road sections within their agglomeration. Noise-reduction measures of the major road sections within agglomerations were incorporated in the NAPs of respective agglomerations.R1 strategic noise mapping reporting data is available online[259][260]

All the obligatory R2 Strategic noise mapping reporting data is available online[261] [262]. Additional voluntary R2 noise contour maps of agglomerations in spatial (GIS) format are available online[263].

18.6.2 Strategic noise mapping methods

Lithuania has no legal and compulsory detailed national guidance on Strategic noise mapping. Instead, the EC's Good Practice Guide for Strategic noise mapping and the Production of Associated Data on Noise Exposure[264] was translated into Lithuanian and published in 2007.

In 2011/2012, the National Public Health Surveillance Laboratory under the Ministry of Health[265] produced non-binding guidance (*The Exemplary Model for the Organization and Implementation of Environmental Strategic noise mapping*) to provide methodological assistance to help in the harmonisation and preparation of SNMs in Lithuania.

Strategic noise mapping methodologies are set out in Hygiene Regulation HN 33:2011 *"Noise Limit Values in Residential and Public Buildings and in Their Environment" (Official Gazette, 2011, No. 75-3638)*[266]. Governmental resolution No. 581 of 2006 approved the State's Strategic noise mapping Programme and the NAP for Year 2006-2007 of State's Strategic noise mapping Programme (Official Gazette, 2006, No. 68-2508)[267]. This sets out main Strategic noise mapping requirements, the measures envisaged, the means of implementation and the key responsible actors, the main deadlines, and the preliminary budget needed to implement the measures. NAP for Year 2008–2012 of the National Strategic noise mapping Programme (adopted by Governmental Decision No. 716 of 2008) (Official Gazette, 2008, No. 84-3356)[268] was

[259] http://cdr.eionet.europa.eu/lt/eu/noise/colsc0ctq/envsc0c6a/

[260] http://cdr.eionet.europa.eu/lt/eu/noise/colss7hqw/envss7kfa/

[261] http://cdr.eionet.europa.eu/lt/eu/noise/df8/envuldvha/

[262] http://cdr.eionet.europa.eu/lt/eu/noise/df8/envutyzgw/

[263] http://cdr.eionet.europa.eu/lt/eu/noise/df8/envuqnhcq/

[264] http://ec.europa.eu/environment/noise/pdf/wg_aen.pdf

[265] http://nvspl.lt

[266] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=402074

[267] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=278272

[268] http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=325017

prepared to ensure implementation of the R2 Strategic noise mapping obligations. SNMs were developed using the "interim" methods provided in Annex II of the END.

Table 189 Strategic noise mapping methods used in R2 - Lithuania

Noise source/type	Method
Road	French NMPB
Railway	Dutch RMR
Aircraft	international ECAC
Industrial	ISO 9613-2

It has not yet been decided by governmental and municipal authorities whether Lithuania will adopt the methodology on a voluntary basis for Round 3 or make the transition to CNOSSOS only once this becomes mandatory in Round 4.

18.6.3 Public accessibility of SNMs

Strategic noise mapping data (statistical information) has been made publically available on the website of the Ministry of Health (www.sam.lt). In addition, SNMs have been made publicly available. For instance:

- Major Roads: www.lakd.lt/lt.php/triuksmo_valdymas/strateginiai_triuksmo_zemelapiai/13700
- Major Railways: http://www.vgi.lt/lt/triuksmo-valdymas
- Agglomerations:
- Kaunas - http://maps.vplanas.lt/aplinka/; Kaunas agglomeration: http://infr.kaunas.lt/noise#null; Klaipėda agglomeration:
- Klaipeda - http://maps.klaipeda.lt/flexviewer/
- Šiauliai agglomeration: http://www.matl.lt/index.php?ID=3;
- Panevėžys agglomeration: http://www.panevezys.lt/lt/veikla/veiklos-sritys/ekologijos-skyrius/aplinkos-apsauga-266/triuksmo-zemelapis.html

Spatial data files of noise contour maps of major roads in shape file format (LT_a_Mroad_L_{den}. * and LT_a_Mroad_L_{night}. *) are available on the website of EEA[269] and comprise noise contour maps of the all major road sections (inside and outside agglomerations). On the same website of EEA, spatial data files of noise contour maps of major railways (LT_a_Mrail_L_{den}. * and LT_a_Mrail_L_{night}. *) are available.

Voluntary R2 noise contour maps in spatial shape file format of agglomerations are publicly available on the EEA website[270].

18.6.4 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, and any new issues raised during R2.

[269] http://cdr.eionet.europa.eu/lt/eu/noise/df8/envutyzgw/

[270] http://cdr.eionet.europa.eu/lt/eu/noise/df8/envugnhcq/

Table 190 Strategic noise mapping issues - Lithuania

R1	R2
Collection of geospatial data outside agglomerations and residential data	Collection of geospatial data outside agglomerations and residential data
The assessment of noise levels from industrial sites	Guide produced by National Public Health Surveillance Laboratory in 2011/2012 – no longer an issue
Lack of common noise assessment methods	Lack of common noise assessment methods. The introduction of CNOSSOS in Round 4 is expected to make a significant difference towards a common approach. The default rail and road noise emission data used for Strategic noise mapping lead to some inaccuracies in the calculation results, so in some cases SNMs had to be corrected to be more comparable with long-term noise measurements.
Some SNMs were completed after the deadline	SNMs of Kaunas agglomeration were revised after the deadline
Lack of available consultants specialised in undertaking strategic noise mapping	At national level, there is strengthened capacity among consultancies to produce SNMs compared with R1. However, there remains a lack of local Strategic noise mapping and Noise action planning specialists in some municipalities.

Looking ahead to R3 Strategic noise mapping, the current lack of budgetary allocation at national level for Strategic noise mapping in 2017 is a concern.

18.7 Noise action planning

18.7.1 Overview

An overview of SNMs and NAPs is shown in the following table:

Table 191 NAPs - Lithuania

	R1	R2
Agglomerations	2	5 (5)
Major airports	n/a	n/a
Major railways	n/a	0[271] (1)
Major roads	1	1 (1)

Source: Member State reporting to the European Commission and EEA, interview with Ministry of Health (CA)

The above table is based on self-reported data on the number of NAPs that were due and have actually already been submitted.

[271] The Ministry of Transport and Communications was warned by the official letter of the Ministry of Health in Dec. 2014. No actions were taken by the Ministry of Transport and Communications.

R1 NAP summaries Vilnius, Kaunas agglomerations and of major roads are available online[272].

R2 NAP summaries for the municipalities of Vilnius, Klaipėda and Šiauliai are available in xml file format online[273] and NAPs summaries for major roads, major railways and for the municipalities of Kaunas and Panevėžys are available in xml file format online[274].

The full text of the R2 NAP for major roads (covers major road sections outside agglomerations) is available on the EEA website[275].The full text of the R2 NAP for major railways (covers all major railway sections) is available on the EEA website[276].

NAPs were prepared for sections of major roads inside and outside of agglomerations in R1 and R2. For major railways, no major railway sections had more than 60,000 movements per year (R1 and R2) but SNMs and NAP was prepared for R2 (76 km of major railways with more than 30 movements a year) of major railway sections inside and outside of agglomerations.

NAPs for agglomerations were developed by the relevant municipal authorities[277], but the development of such NAPs required close cooperation with other organisations at national level also involved in Strategic noise mapping and Noise action planning. For instance, in relation to major railways, Noise action planning for major sections of rail falling within agglomerations, as well as those located outside, are carried out by the State Railway Inspectorate. They are also responsible for planning and implementing noise reduction and mitigation measures.

In the case of major roads, whilst the Lithuanian Road Administration has prepared NAPs for major road sections outside agglomerations, the agglomeration NAPs for Vilnius, Kaunas, Klaipėda, Šiauliai and Panevėžys prepared by the city municipalities include noise reduction measures for sections of major roads within their agglomerations.

18.7.2 Methodologies for noise action planning

There is no legal framework setting out a detailed common methodology for Noise action planning in Lithuania. Instead, in order to provide methodological assistance and to harmonise the preparation of NAPs, the National Public Health Surveillance Laboratory under the Ministry of Health organised the preparation of a common Noise action planning methodology: Exemplary Model for the Organization and Implementation of Environmental Noise Prevention. An example model is published on the website of the Ministry of Health at http://nvspl.lt.

CAs have faced various problems in drawing up NAPs. The strategic maps were used as a basis for developing the NAPs. The exceeding of national noise limits was used as the main basis for establishing priorities in the NAPs.

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[272] http://cdr.eionet.europa.eu/lt/eu/noise/df7/envst919w/

[273] http://cdr.eionet.europa.eu/lt/eu/noise/df10/envvg24ua/Noise_Action_Plans_summaries_DF_7_10__1.xml/manage_document

[274] http://cdr.eionet.europa.eu/lt/eu/noise/df10/envutkztq/questionnaire_noise-df7_10.xml/manage_document

[275] Noise action plan (LT_a_AP_MRroad00001.pdf) of major roads on http://cdr.eionet.europa.eu/lt/eu/noise/df10/envutkztq/.

[276] Noise action plan (LT_a_AP_MRail00001.pdf) of major railways on http://cdr.eionet.europa.eu/lt/eu/noise/df10/envutkztq/.

[277] Klaipėda city municipality, Šiauliai city municipality, Panevėžys city municipality, Vilnius city municipality, Kaunas city municipality.

18.7.3 Measures

Among the different types of measures implemented in R1 and R2 are:

- Traffic planning – e.g. constructing a bypass
- Land-use planning
- Technical measures at the source
- Noise insulation
- The reduction of sound transmissions.

18.7.4 Public consultations

NAPs were published on the websites of the CAs responsible for the development of particular NAPs for agglomerations, major roads and major railways. However, in many cases consultation was not generally given a high priority by the national authorities and local (city) municipalities responsible for Noise action planning.

An exception was Kaunas City Municipality whose administration organised a dedicated public meeting in November 2013 to launch the consultation process on the development of the Kaunas agglomeration NAP for the 2014 – 2018 period. The purpose of the meeting was to explain the NAP in detail and to outline the proposed noise prevention measures and the zones designated as quiet areas. Following the meeting, written responses to the proposals were solicited and these were published by Kaunas City Municipality on its notice board and on the municipal website (www.kaunas.lt).

During the period from 18th September– 11th November 2013, the draft NAP proposals were exhibited on a municipal bulletin board in the Health section of the municipal administration. The public were also invited to submit requests and proposals for noise protection measures before the NAP was finalised. The public were given access to an online and hard copy version of the NAP proposals, the annexes as well as to the meeting minutes from the public meeting.

18.7.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with any subsequent actions taken to address them, and new issues raised during R2.

Table 192 Noise action planning issues - Lithuania

R1	R2
A lack of consistency in NAP content and detail due to different interpretations of requirements	
A lack of financial and human resources	A lack of financial and human resources within public administration to implement the END was again noted. There was initially insufficient budget to implement Noise action planning tasks in R2 (and a knock-on delay in complying with deadlines).
Lack of local Noise action planning specialists	The lack of local Noise action planning specialists was again an issue, especially in smaller municipalities implementing the END for the first time.

R1	R2
	Availability of finances to implement measures identified through Noise action planning
	(The ability to) compel noise source holders to implement reduction measures

19. LUXEMBOURG

19.1 National implementing legislation for END

19.1.1 Legal implementation

The END was transposed through the Grand Ducal Regulation of 2nd August 2006[278]. Noise limit values for establishments and building sites are fixed by the Grand Ducal Regulation of 13th February 1979 on the level of noise in the immediate surroundings of establishments and construction sites, as amended by Grand Ducal Regulation of 7th November 2007[279]. Additional noise limit values are set under Grand Ducal Regulation of 16th November 1978 on the sound levels for music within establishments and in their neighbourhood.

19.1.2 Scope of END implementation – Rounds 1 & 2

The coverage of Strategic noise mapping and Noise action planning in Luxembourg was the same in Rounds 1 and 2 for airports (1), major roads (128km) and railways (20km). The introduction of thresholds in R2 meant that one agglomeration now falls within scope. These do not however fall within END scope.

Table 193 END coverage – Luxembourg

Round	Agglomerations	Major airports	Major rail	Major roads
1	n/a	1	20 km	128 km
2	1	1	181 km	718 km

19.2 Competent Authorities and designated administrative bodies

On the basis of Article 5 of the Grand Ducal Regulation of 2nd August 2006, the *Environment Administration* is the administrative body responsible for implementing the technical provisions of the Regulation. In consultation with Ministries, administrations and other interested parties, establishing, revising and publicising SNMs and NAPs for agglomerations, major roads and railways, major airports and quiet areas, and for collecting SNMs and NAPs. According to Article 8, *"Strategic noise mapping*" and Article 9, *"NAPs"*, SNMs and NAPs are approved by the Ministry for the Environment[280]. However, following organisational changes, responsibility has now been transferred to the Ministry of Sustainable Development and Infrastructure. An overview of the different responsibilities in END implementation is provided below:

[278] Règlement grand-ducal portant application de la directive 2002/49/CE du Parlement européen et du Conseil du 25 juin 2002 relative à l'évaluation et à la gestion du bruit dans l'environnement. http://eli.legilux.public.lu/eli/etat/leg/rgd/2006/08/02/n4

[279] http://www.legilux.public.lu/leg/a/archives/2007/0204/a204.pdf#page=2

[280] http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_plans_action/index.html?highlight=bruit

Table 194 Administrative Responsibility for the END – Luxembourg

Role/Activity	Agglomerations	Roads	Railways	Airports
The provision of information and data	Ministry of the Interior and the Regions Local authorities	National road administration[281] (major roads and roads outside agglomerations) Local authorities (within agglomerations)	National railways[282]	Luxembourg Airport
Preparing SNMs	Ministry of Sustainable Development and Infrastructure (development of SNMs and NAPs)	Ministry of Sustainable Development and Infrastructure (development of SNMs and NAPs)	Ministry of Sustainable Development and Infrastructure (development of SNMs and NAPs)	Ministry of Sustainable Development and Infrastructure (development of SNMs and NAPs)
Approving SNMs				
Preparing NAPs				
Approving NAPs				
EC/EEA reporting	Environment Administration[283] within the Ministry for the Environment			

Whilst national coordination is under the overall responsibility of the Ministry of Sustainable Development and Infrastructure, the implementation of noise reduction measures identified in NAPs at local level remains with the competent authorities for these measures.

19.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

19.3.1 Data collection

Data required for delimitation of major road/train axis, airports and agglomerations were made available by relevant bodies upon request by the CAs.

19.3.2 Implementation issues

The sole issue raised was the difficulty in acquiring sufficient skills and competences to undertake the work required for the greater geographic scope required in R2.

19.4 Noise limits and targets

19.4.1 Scope

In Luxembourg, there are legally binding noise limit values and also non-binding noise trigger values. The Grand Ducal Regulation of 1979, as amended in 2007, sets out noise limit values in six zones for establishments and construction sites. With regard to road and rail noise, German national legislation is applied. These applied both in R1 and R2.

[281] Administration des ponts et chaussées - http://www.pch.public.lu

[282] Société Nationale des Chemins de Fer Luxembourgeois (CFL)

[283] http://www.environnement.public.lu/

Table 195 Noise limit values – R1 - Luxembourg

Zone	Noise Level (dB(A))		Nature of zone
	Day	Night	
I	45	35	Hospitals, recreational areas
II	50	35	Rural area, quiet residential area, low traffic
III	55	40	Urban area, mainly residential, low traffic
IV	60	45	Urban district with some factories or businesses, average level of traffic
V	65	50	Town centre (businesses, shops, offices, entertainment), heavy traffic
VI	70	60	Mainly heavy industry
Major Road and Rail routes			
	57	47	Hospitals, schools, sanatorium and nursing homes
	59	49	Pure and general and small residential estate areas (residential dwelling with a garden or agricultural smallholding)
	64	54	In business zones (mainly for commerce, gastronomy, and industry and administration), village areas, and mixed areas (residential and business/commerce)

Limit values for major road and rail routes are aligned with the German Ordinance on the Protection from Traffic Noise, sixteenth act on the implementation of the Federal Pollution Protection Law (Verkehrslärmschutzverordnung, Sechzehnte Verordnung zur Durchführung des Bundes-Immissionschutzgesetzes) of 12th June 1990. Limit values to trigger the development of R1 NAPs (http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_valeurs_limites/let-comite-pil.pdf) were established in the Ministry of the Environment's Decision of 17th July 2008. This approach was continued in R2.

19.4.2 Non-binding target values

In addition, to the legally binding noise limit values set out above, there are also non-binding noise trigger values, as summarised in the following table:

Table 196 R1 and R2 NAP Trigger Values - Luxembourg

Requirement	Noise Level - dB(A)	
	L_{den}	L_{night}
Develop NAP	70	60
Implement measures to reduce noise in NAPs	65	≥ 55

19.4.3 Implementation issues

Limit values adopted in 2008 to trigger NAP development and associated measure were based on the German approach to noise management and WHO recommendations[284].

The issues identified in respect of END implementation in R1 and 2 in relation to limit values and non-binding target values are summarised in the table below.

Table 197 Implementation issues in respect of limit values and non-binding target values – Luxembourg

R1	R2
The L_{den} and L_{night} noise indicators do not match with the noise indicators used under previous legislation. With the implementation of the END, the Luxembourg authorities were obliged to change indicators and methodology.	The situation had improved by R2 as the L_{den} and L_{night} noise indicators became more widely accepted by stakeholders.
Although there were legally binding noise limit values in place, there was still a major challenge as to what should happen when noise limits are exceeded.	The scope of the problem of exceedance of noise limit values continues to be an issue.

19.5 Quiet areas

19.5.1 Overview

As there were no END-defined agglomerations in R1, no "quiet zones" were designated in agglomerations. Since R1, progress has nevertheless been made, for instance, criteria were developed for the identification of potential quiet areas. The Ministry of Sustainable Development and Infrastructure has commissioned a study on potential quiet areas but this has not yet been finalised.

Delimitation

It is important that wider national policies are taken into account in the designation and delimitation of quiet areas, notably the Sectoral Landscape Plan (Plan Sectoriel Paysage (PSP))[285]. Noise will be only one of many criteria used in the PSP in the context of zones that should be protected for their "environmental quality". Specifically, the PSP deals with areas of landscape worthy of protection, in which the building of new infrastructure should be avoided if it would lead to additional fragmentation.

Agglomerations

As there were no END-defined agglomerations in R1, no "quiet zones" were designated in agglomerations. Quiet zones are usually zones, in agglomerations, that should be protected for their "environmental quality". Noise is only one of the many criteria to be taken into account in the protection of those zones.

[284] http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_valeurs_limites/bruit.pdf

[285] http://www.environnement.public.lu/conserv_nature/dossiers/PSP/avantprojet_oct2008.pdf

Open country

Quiet areas in open country are usually defined as areas located in the countryside that need to be protected to preserve their "environmental quality" within the overall framework of the Sectoral Landscape Plan (PSP) mentioned above. Noise is only one of the many criteria to be taken into account in the protection of those zones.

19.5.2 Implementation issues

No issues were highlighted in either Round since there are as yet no quiet areas.

19.6 Strategic noise mapping

19.6.1 Overview

In R1, the Environment Administration developed SNMs for Luxembourg's major transport infrastructure, including motorways A1, A3, A4, A6 and A13, the Luxembourg-Esch/Alzette railway line, and Luxembourg airport. In R 2, SNMs were again developed for road and railways and for Luxembourg airport. An overview of SNMs produced in R1 and R2 is shown below.

Table 198 SNMs - Luxembourg

	R1	R2
Agglomerations	0	1
Major airports	1	1
Major railways	1	1 (181 km)
Major roads	1	1 (718 km)

19.6.2 Data collection

Data required for the development of SNMs were provided by the relevant designated CAs at different levels of governance.

19.6.3 Strategic noise mapping methods

No common methodology was formally established at national level either in R1 or R2. In principle, the interim method was used in most areas but for airports, some customisation was necessary so it can be considered as a national method. However, this has been complemented by the AZB German recommendations. There was a minor change in the process between Rounds in airports. The Ministry of Sustainable Development and Infrastructure and local authorities in Luxembourg instead followed good practice guidance provided by the EEA. In accordance with the Directive, L_{den} and L_{night} were used to establish SNMs and no further indicators were used.

19.6.4 Public accessibility of SNMs

Rounds 1 SNMs were made available on the Ministry of the Environment's website. In R2, the maps have again been made accessible. http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_plans_action/index.html?highlight=bruit

Ongoing noise emissions monitoring of Luxembourg airport is accessible to the public at: http://www.aeroport.public.lu/fr/environnement/index.html

19.6.5 Implementation issues

Issues raised in Rounds 1 and 2, together with actions taken to address them, where these could be identified, are shown in the table below.

Table 199 Strategic noise mapping issues - Luxembourg

Round 1	Round 2
Development of the initial methodology for noise mapping was challenging in small countries.	Comparability of NAPs between countries – in Luxembourg, a greater level of detail has been presented in noise exposure data. The situation appears worse than it actually is in the EEA's Noise in Europe report. Comparability between Rounds was broadly OK. Increased subcontractor costs between Round 1 and 2 to reflect increase in mapping. However, reduced internal costs among public authorities due to greater familiarity with the mapping requirements.

19.7 Noise action planning

19.7.1 Overview

In Luxembourg, Noise action planning under the END is seen as an important component of the National Strategy for the prevention and combatting of environmental noise. An overview of SNMs and NAPs is shown in the following table.

Table 200 NAPs – Luxembourg

	R1	R2
Agglomerations	0	1
Major airports	1	1
Major railways	1	1
Major roads	1	1

Source: CA

19.7.2 Methodologies for noise action planning

In R1, a national inter-ministerial Steering Committee was created under the Grand Ducal Regulation to develop NAPs. The 2006 SNMs were used to establish NAP priorities which were set at a national level and to identify priority areas where noise limit values adopted by the Ministry of Environment in 2008 were exceeded. The decision to develop an NAP was determined by:

- The extent to which limit values had been exceeded;
- A combination of other factors, including:
  - The number of people affected
  - The presence of critical infrastructure.

A similar approach was adopted in R2. The 2012 SNMs have been used as the basis for the development of the R2 NAPs. However, as of May 2015, these do not appear to be publicly available. The implementation of NAPs has been prioritised using these criteria and adjusted according to the budget available. Other criteria considered when setting priorities, included technical constraints, the scale of the works, investment costs and opportunities for direct action as part of on-going or planned projects.

19.7.3 Measures

In Luxembourg, NAPs have prioritised noise prevention measures at source since there was perceived to be more cost-efficient in tackling noise at source. It was however recognised that in order to be effective, these should be supplemented by further measures to tackle noise hotspots identified in NAPs e.g. erecting noise barriers and soundproofing housing facades exposed to noise. Examples of the types of measures implemented in R1 are provided in the following box:

Railway NAP: Key actions

- Systematic consideration of noise in determining the operating conditions of new railway infrastructure
- Remediation of priority areas for noise management, as defined by strategic mapping along the railway line Luxembourg-Esch
- Prevention and Remediation of noise problems related to the operation of the viaduct Pulvermühle and of Esch-sur-Alzette.

Road NAP: Key actions

- Remediation of priority areas for noise management, as defined by strategic mapping along the national motorway network
- Prevention and remediation of noise problems related to the operation of the A3 and A6 between Bettembourg and Strassen.

Airport NAP: Key actions

- Establishment of a management organisation on soundproofing of housing around Luxembourg airport and creating a grant scheme for soundproofing dwellings located in noise management areas.
- Redefining zoning based on noise exposure provided by the Luxembourg airport land use plan.

In 2013, a new financial aid scheme was introduced for the improvement of sound insulation of residential buildings against airborne noise around Luxembourg Airport. A Grand Ducal regulation was adopted to provide grants which came into force on 1 May 2013. Subsidies are provided for windows-related and attic insulation measures.

The R2 NAPs have not yet been published.

Priority was given in both Rounds 1 and 2 to using the process of developing SNM as the basis for identifying priority areas where noise reduction measures should be targeted in NAPs. The steering committee responsible for preparing NAPs are given flexibility in the assessment criteria to select appropriate noise abatement measures to allow different factors to be taken into consideration (e.g. the costs of measures, opportunity costs, level of exposed population by dB threshold, etc.). Permanent noise monitoring was also set up next to Luxembourg airport to provide monthly reports on noise levels.

19.7.4 Public consultations

With regard to public consultation, in R1, the draft NAP for the management of noise Luxembourg airport was presented on March 16th, 2009 in Sandweiler[286], while NAP projects for the management of rail and road noise were presented on 1st April 2009 in Schifflange[287]. Noise awareness campaigns were run during R1 by competent ministries. The results of the insulation verifications were also communicated to the public.

In R2, public consultation input received through the consultations were regarded as having been useful by the National Competent Authority interviewed. The draft NAPs were made available on the Environment Administration's website. Following comments received, revisions were then made by the Steering Committee before the NAP was provisionally finalised. However, there have been delays in the final political approval of R2 NAPs and their subsequent publication.

19.7.5 Implementation issues

No issues were raised as a result of END implementation in R1. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 201 Noise action planning issues - Luxembourg

R1	R2
Development of an initial methodology for NAPs was challenging in smaller EU countries. There was a lack of human resources to develop a methodology for action planning and challenges in ensuring effective coordination between the development of SNMs and NAPs.	Noise action planning in Luxembourg has been beneficial because it has meant that the responsible public authorities have given early consideration to reviewing major transport infrastructure projects being implemented in the next five years.
	There has been a focus on identifying in advance whether there are hotspots or priority zones to ensure that they are taken into account from the design phase. The costs are much lower if noise mitigation measures are dealt with from the outset.

[286] For the presentation material see: http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_enquete_publique/sceance_publique_aeroport_13032009.pdf

[287] For the presentation material see: http://www.environnement.public.lu/air_bruit/dossiers/BR-bruit/bruit_enquete_publique/sceance_publique_routesrail_01042009.pdf

20. MALTA

20.1 National implementing legislation for END

20.1.1 Legal implementation

Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise was transposed by Subsidiary Legislation 549.37 *"Assessment and Management of Environmental Noise Regulations",* on the basis of the Environment Protection Act (Chapter 549). This places it within the country's wider noise and nuisance legislative framework.

Table 202 Noise Management – Malta

Agency	Responsibility
Environment and Resources Authority (ERA) falling within the portfolio of the Ministry for Sustainable Development, Environment and Climate Change (MSDEC), which is responsible for Environmental Policy.	Responsibility for reporting obligations under the END Environmental assessments - **Environmental Impact Assessment (EIA)** – falling within the remit of ERA and **Strategic Environmental Assessment (SEA)** falling within the remit of MSDEC Environmental policy enforcement
Police	Enforcing Code of Police Laws in order to regulate nuisance or noise.
Department of Health	Considers noise within National Environmental Health Action Plan
Malta Competition and Consumer Affairs Authority (MCCAA)	Product safety, including noise limit values for certain equipment, and craft
Planning Authority (PA)	Planning Mapping and land surveying – National Mapping Agency is primary supplier of data for Strategic NM
Other *(Transport Malta, Occupational Health and Safety Authority, Malta Tourism Authority, Local Councils)*	Emissions from roads; airport regulation; workplace noise regulation; hostelry licensing; …

20.1.2 Scope of END implementation – Rounds 1 & 2

R1 of Strategic noise mapping and Noise action planning in Malta covered no agglomerations, airports or railway, but 173 km of roads[288]. The reduction in thresholds by 50% for R2 *increased* coverage to one agglomeration and 292km of major roads.

Table 203 END coverage – Malta

Round	Agglomerations	Major airports	Major rail (km)	Major roads

[288] Data Flow 7 Supplementary report, Noise Action Plan (Summary), MEPA, January 2013

				(km)
1	n/a	n/a	n/a	173
2	1	n/a	n/a	292

20.3 Competent Authorities and designated administrative bodies

The Environment and Resources Authority (ERA) is the designated CA with responsibility for:

- Developing SNMs
- Publishing information on environmental noise
- Drawing up NAPs.

One of the major challenges which Malta faced was to establish the key stakeholders responsible for the implementation of the END including the provision of data. As part of the reporting for R2, a "noise steering committee" was established. This committee was composed of all key stakeholders, which are considered to be the major sources.

20.4 Designation and delimitation of agglomerations, major roads, major railways and major airports

20.4.1 Data collection

For R1, a range of spatial datasets were collected to meet the END's requirements.

Table 204 Agglomeration design databases

Database	Source	Scope
CORINE land Cover (CLC)	Information Resources Unit, PA (IR)	CORINE "urban fabric" layer Some adjacent CORINE "industrial, commercial and transport units" [to overcome urban layer inconsistencies
Limit of Development	PA Planning	Extent of urban fabric from a planning perspective
Open spaces	PA Mapping Unit	When partially/wholly within agglomeration footprint
Population distribution	National Statistics Office (NSO), PA IR	Census Output Area (COA) Geographic footprint of each COA Coastline Satellite Imagery LA boundaries
Reference data Traffic counts	ERA Environment & Resources Authority Transport Malta	Air Quality agglomeration definition Road traffic counts statistics
CORINE land Cover (CLC)	Information Resources Unit, PA (IR)	CORINE "urban fabric" layer Some adjacent CORINE "industrial, commercial and transport units" [to overcome urban layer inconsistencies

For R2, the same datasets were used as for R1.

20.4.2 Implementation issues

Were any issues identified and addressed?

For R1, a need for coordination with respect to data collection and ownership was identified. Therefore, to improve stakeholder engagement and collaboration a cross-departmental working group on Strategic noise mapping was established.

For R2, the data acquisition exercise was time consuming due to unavailability of data. Therefore data had to be based on a number of assumptions in line with guidance documents provided by the European Commission to reach the acoustic calculation requirements.

Table 205 Designation issues - Malta

R1	R2
There was a need for coordination on data collection and stakeholder engagement. A working group on Strategic noise mapping was established.	Data acquisition was laborious and time consuming Data sets for noise calculations had to be optimised.

20.5 Noise limits and targets

Malta has no limit values in force or under preparation[289].

However, R1 proposed onset levels, for assessment of noise mitigation measures due to road traffic noise exposure were (a) L_{den} = 65 dB and (b) L_{night} = 55dB.

20.6 Quiet areas

20.6.1 Overview

The regulations empower ERA through the development of NAPs to:

- Setup noise managements zones;
- Designate quiet areas either inside agglomerations or in open countryside; and
- Establish noise reduction programs where necessary.

The NAP for Malta acknowledges the importance of preserving Quiet Areas. However, no such quiet areas have been defined by the competent authority yet.

Delimitation

For R1, the identification and preservation of quiet areas in the vicinity of a major road is considered to be below the proposed on set level at (a)L_{den}: 55dB and (b) L_{night}: 45dB.

Areas having noise levels below thresholds have been identified such that the NAP notes the need for preserving quiet areas.

Agglomerations

Information is currently not available.

[289] *Data Flow 7 Supplementary report Noise Action Plan(Summary), 2013, Section 2.4*

Open country

The preservation of relatively quiet areas in open countryside was also to be considered in the NAP.

20.6.2 Implementation issues

No implementation issues have been identified since no quiet areas have yet been defined.

20.7 Strategic noise mapping

20.7.1 Overview

For Round 2 reporting, major roads (and a single agglomeration, the "Malta Noise Agglomeration" were identified by MEPA. The identification of such sources was supported by Acustica Ltd. and Transport Malta (TM) from auto-count surveys and TEN-TM feasibility study reports held by the relevant authorities. Where data gaps were identified, estimates were made based on the recommendations from WG-AENGPGv2. The total length of R2 major roads is 292km compared with 173 km mapped as R1 major roads.

The agglomeration identified has a population of 243, 746 and an area of 65.8km^2. Hence this was not an END agglomeration under the first round (2007) but was reported in 2007 (R1). However it is an agglomeration that was identified and used for R2 and subsequent rounds.

The Strategic noise mapping included are as exposed to noise from the major roads above a level of L_{den} 55dB (A) or L_{night} 50dB(A).An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 206 SNMs – Malta

	R1	R2
Agglomerations	1	1
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	173 km	292 km

It can also be noted that R1 noise maps were only required in Malta for major roads. The SNM was however developed late and published in 2011. The submission of noise maps for R2 (which included a noise map for agglomeration and all major roads) was published and reported to the European Commission in December 2012 (in line with the deadline of END).

An update of noise maps for Malta is expected to be available by the end of December 2017 only. In R2, this will be required for both one agglomeration and for major roads.

20.7.2 Data collection

Data collection methods

SNMs have been generated by estimating noise levels from Major Roads (defined as roads with more than 6 million vehicle passages annually, for R1 and 3 million vehicle passages for R2) then derived by computational methods.

Data collection responsibility

The input data required to develop the SNMs is wide-ranging in its coverage and quantity, and is managed by a number of stakeholders, apart from the competent authority which is ERA. Transport Malta records traffic data, the PA as the national mapping agency records landscape and building information and the National Statistics Office records information on population.

Data availability

For R1, a document prepared by consultants[290] provides an overview of the data sources. In particular, Chapter 4.8 deals with the collection of data and building the new noise model. On pages 49-51, information is provided about the source data, pathway data and population data utilised, as summarised in the following table:

Table 207 Data sources for Round 1 Noise Mapping

Data sources:	Description of data source and detail
Major roads	3 sources of traffic flow data were made available to the consultants: • The MT 2005 dataset that was reported to the EC in 2005 • Autocount dataset – traffic count with short-term auto traffic count data of up to 1 week in duration (1989 – 2007) • TEN-T dataset. Feasibility and environmental impacts of T-TEN transport infrastructure projects for Malta.
Pathway data	The 3D environment to support the assessment of road noise from 2000 roads consisted of the following datasets: • Digital terrain dataset • Ground cover (CORINE 2006) • Buildings dataset (MEPA basemap) • Barriers dataset (MEPA basemap) • Bridges dataset (defining the position and height of bridges)
Population data	Malta Census of population data and Housing data 2005 were used. Note – for R2, it is likely that Census of Population and Housing data 2011[291] will be used.

Source: Consultancy and field surveys to implement the EU Noise Directive 2002/49/EC in Malta (Acustica consultancy, see pages 49-51.

It should be noted that since there were no major airports, major railways or agglomerations within the scope of the END in Malta in R1 (only for major roads), it was not required to determine the noise model areas for these infrastructure.

[290] Consultancy and field surveys to implement the EU Noise Directive 2002/49/EC in Malta (Acustica consultancy, UK), https://www.mepa.org.mt/file.aspx?f=6847

[291] https://nso.gov.mt/en/publicatons/Publications_by_Unit/Documents/01_Methodology_and_Research/Census2011_PreliminaryReport.pdf

Table 208 - Data sources for Round 2 Noise Mapping

Data sources:	*Description of data source and detail*
Major roads	3 sources of traffic flow data were made available to the consultants: • The MT 2005 dataset that was reported to the EC in 2005 • Autocount dataset – traffic count with short-term auto traffic count data of up to 1 week in duration (1989 – 2007) • TEN-T dataset. Feasibility and environmental impacts of T-TEN transport infrastructure projects for Malta.
Pathway data	The 3D environment to support the assessment of road noise from 2000 roads consisted of the following datasets: - Digital terrain dataset - Ground cover (CORINE 2006) - Buildings dataset (MEPA basemap) - Barriers dataset (MEPA basemap) - Bridges dataset (defining the position and height of bridges)
Population data	Census of Population and Housing data 2011.
Population distribution	Census Output Area (COA) Geographic footprint of each COA Coastline Satellite Imagery
CORINE land Cover (CLC)	CORINE "urban fabric" layer Some adjacent CORINE "industrial, commercial and transport units" to overcome urban layer inconsistencies
Limit of Development	Extent of urban fabric from a planning perspective (to determine the building block of the infrastructure)
Open spaces	When partially/wholly agglomeration footprint

20.7.3 Strategic noise mapping methods

R1 SNMs were generated by estimating noise levels from Major Roads – (defined as roads with more than 6 million vehicle passages annually) then derived by computational methods.

R2 SNMs were generated by estimating noise levels from: a) Major Roads (defined as roads with more than 3 million vehicle passages annually) b) Agglomeration (defined by an area within a territory delimited by the Member State having a population of more than 100,000 persons and a population density such that the Member State considers it to be an urbanised area); and then were derived by computational methods.

Since Malta does not have any national methods, therefore as indicated in the END, the national regulations specify that the EC recommended Interim Methods are to be used for strategic noise mapping. Therefore, Malta used these Interim Methods.

20.7.4 Public accessibility of SNMs

The R1 and R2 noise maps for Malta (for major roads and the agglomeration, including a separate map for industrial noise) have been made available online (http://era.org.mt/en/Pages/Noise-Maps0316-9547.aspx).

20.7.5 Implementation issues

Table 209 Strategic noise mapping issues - Malta

R1	R2
To improve stakeholder engagement and improve collaboration by establishing a cross-departmental working group on environmental Strategic noise mapping, a Working Group was set up.	Encourage the development of a national policy statement on noise.
Encourage the development of a national policy statement on noise. -	Utilise improved input data delivered via GIS enabling of Government agencies and the Lidar survey results.
Utilise improved input data delivered via GIS enabling of Government agencies and the Lidar survey results.	To develop a unified spatial data infrastructure for sharing relevant datasets between stakeholders.
To develop a unified spatial data infrastructure for sharing relevant datasets between stakeholders.	
There were delays in R1 and the SNMs were only published in 2011.	

20.8 Noise action planning

20.8.1 Overview

- The NAP was prepared in accordance with the END's requirements, and an overview of SNMs and NAPs that were due in R1 and R2 is shown in the following table. It can be observed that in R1, there were no NAPs required for agglomerations, major railways or major airports falling within the transitional END thresholds. A NAP was however required in respect of major roads. In R2, a NAP for one agglomeration in Malta was required and for major roads, but these have not been submitted to the EC yet. The latest available estimates for the delivery of these documents is: Noise action plan for major roads by end of October 2016
- Noise action plan for agglomerations due by the end of January 2017

Table 210 NAPs– Malta

	R1	R2
Agglomerations	1	1
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	1	1

Source: Malta Environment and Planning Authority (http://www.mepa.org.mt/topic-noise)

In Malta, Greater Valetta is the only agglomeration with a population above 250,000.

20.8.2 Methodologies for noise action planning

The R1 NAP set out a proposed approach for a study (to identify) any necessary noise reduction measures. The plan also outlined a method by which noise mitigation measures were to be assessed for feasibility.

The R1 NAP's approach was to manage and reduce environmental noise emissions and its impact at source through operating procedures and restrictions. The NAP was drafted on the basis of recommendations made to the Competent Authority by a team of noise experts engaged through a consultancy contract[292] to assist in the implementation of the END, to prepare the required SNMs and to draft the technical specifications for the supply of noise monitoring equipment.

20.8.3 Measures

Round 1 and 2 NAP noise (mitigation) measures are shown in the table below.

Table 211 – Noise action planning measures - Malta

R1	R2
Improve stakeholder engagement and improve collaboration by establishing a cross-departmental working group on Strategic noise mapping	Currently not available. There have been delays in the development of R2 action plans, however Malta indicated the timeframes when such plans and maps will be delivered.
Encourage the development of a national policy statement on noise, adoption of noise as a public health issue, and development of guidance on the assessment of neighbourhood noise entertainment noise and noise nuisance.	
Utilise improved input data delivered via GIS enabling of Government agencies, the proposed Inspire portal and especially the wider environmental monitoring programme, specifically LiDAR survey results	
Develop capacity within MEPA to deliver the requirements of the Noise action planning process set out within the strategy,	
Procure noise measurement equipment and mapping software	
Introduce additional trained personnel who are required to undertake the specialised work set out	
Provide staff training to enable effective use of the technical measurement equipment and Strategic noise mapping software procured.	
Develop planning guidance - an assessment of noise on proposed residential developments, Guidance on control of envisaged noise impact from proposed developments on existing residential areas	
Work closely with the Planning section to ensure all applications with a noise aspect, whether producer or recipient, are assessed by specialist staff within the noise team.	

20.8.4 Public consultations

The R1 Draft NAP was published for public consultation on the MEPA website with the general public invited to submit comments. This process started on June 1, 2011. The process was formally open for 4 weeks. Further information on this public consultation can be found on: http://www.mepa.org.mt/newslet15-article2 and http://www.mepa.org.mt/news-details?id=703.

[292] Assignment "Consultancy and field surveys to implement the EU Noise Directive 2002/49/EC in Malta", Acustica Consultancy, UK, http://contracts.gov.mt/en/Tenders/Pages/Archived/2009/CT2332.aspx

To solicit input, a number of presentations were also made with key stakeholders, such as the 13 June, 2011 presentation organised for the general public by the Malta Environment and Planning Authority in collaboration with the Malta-EU Steering and Action Committee (MEUSAC). A MEUSAC core group meeting took place on 27 May 2011 and an Information Session on 13 September 2011. A number of media events were also organised.

Since there have been delays in the R2 NAPs being published, no consultation has yet taken place in respect of R2 NAPs.

20.8.5 Implementation issues

The main issues identified with regard to noise action planning relate to the delays in noise action planning experience in both Rounds 1 and 2. There appears to be a lack of in-house capacity, however ERA has recently embarked on an extensive recruitment drive with resources also earmarked for the implementation of the END. However, the results from the consultancy report provided a significant input to the development of the Round 1 NAP. However, as yet, no R2 NAP is available.

21. NETHERLANDS

21.1 National implementing legislation for END

21.1.1 Legal implementation

The Netherlands transposed the END into national legislation through amendments to the Noise Abatement Act of 1979 (Wet Geluidhinder)[293] in June 2004[294]. Noise-related issues covered by the Noise Abatement Act include: equipment and soundproof facilities; industrial noise, insofar as it relates to industrial sites; road traffic; railway noise; and developing SNMs and NAPs under the END. In January 2007, among further amendments to the Noise Abatement Act were the introduction of L_{den} as the key metric for road traffic and railway noise.

A further amendment to the Noise Abatement Act made in 2007[295] was that there was a process of decentralising responsibility for Strategic noise mapping and Noise action planning in agglomerations to Dutch municipalities and provinces. In total, about sixty municipalities are involved in Strategic noise mapping and Noise action planning.

In July 2012, further legislative changes were introduced. The implementation of the END for national (major) roads and railways moved to the Environmental Protection Act, whilst environmental noise for roads in agglomerations and for industrial noise remains within the Noise Abatement Act. The revisions to the 2012 Environmental Protection Act also introduced changes to noise limits for national (major) roads and railways, which are now set out in Chapter 11 of the Act. Under the revised Act, by 2018, every municipality in the Netherlands will have to produce a SNM and NAP not only agglomerations.

There are also links between the Noise Abatement Act and other Dutch national legislation. For instance, a new planning law on homes located in rural areas was adopted in 2012[296]. Article II of the Noise Abatement Act has been adjusted in relation to the implementation of measures to reduce noise emissions in order to strengthen the planning regime. The definitions for home, building and other sensitive noise areas have been adjusted accordingly. Changes were made to the Calculation and Measurement Regulations on noise in 2012. Only some changes were relevant to the implementation of the Noise Abatement Act.

21.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in The Netherlands included 6 agglomerations, 1 airport, 854 km of railway and 3,503 km of major roads. The introduction of definitive thresholds in R2 led to 15 *additional* agglomerations. Airport, rail and road coverage stayed the same, with the latter reflecting a R1 decision to cover 100%.

[293] http://www.vrom.nl/pagina.html?id=7652

[294] 30 June 2004, staatsblad 338, memorie van toelichting 29021-3

[295] Information sheet on the 2007 amendment to the Noise Abatement Act, available in Dutch at: http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=6403

[296] Plattelandswoningen Stb. 2012, nr. 493, Stb. 2012, nr. 571

Table 212 END coverage – The Netherlands

	Agglomerations	Major airports	Major rail	Major roads
R1	6[297]	1	854 km	424 km
R2	21[298]	1	854 km	3,503 km

21.2 Competent Authorities and designated administrative bodies

The Ministry of Infrastructure and Environment is the national CA in the Netherlands. The Ministry is responsible for the collection of data related to SNMs and NAPs for agglomerations. In October 2010, the Ministry of Housing, Spatial Planning and the Environment (VROM) and the Ministry of Transport, Public Works and Water Management merged into the Ministry of Infrastructure and Environment[299].

Municipalities are responsible for the development and approval of SNMs and NAPs. The Ministry of Transport, Public Works and Water Management is responsible for making and approving SNMs concerning major roads, railways and airports.

Table 213 Administrative Responsibility for the END - The Netherlands

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities (i.e. local authorities)	Ministry of Infrastructure and Environment (Rijkswaterstaat for highways) Provinces* (i.e. regional authorities) Municipalities (i.e. local authorities)	Ministry of Infrastructure and Environment	Ministry of Infrastructure and Environment
Approving SNMs				
Preparing NAPs				
Approving NAPs				
EC/EEA reporting	Ministry of Infrastructure and Environment**			

**A Dutch province represents the administrative layer in the Netherlands between the national government and the local municipalities, and has responsibility for matters of subnational or regional importance.*

***As noted earlier, the Ministry of Housing, Spatial Planning and the Environment (VROM) and the Ministry of Transport, Public Works and Water Management were merged into a single Ministry in October 2010.*

Responsibility for roads is shared between the provinces at regional level and local authorities. The provinces are responsible for Strategic noise mapping and Noise action planning for main roads that are not national highways or local/municipal roads. Local authorities at municipal level are responsible for the provision of data and information on local / municipal roads.

[297] Amsterdam, Eindhoven, Heerlen, Rotterdam, The Hague, Utrecht

[298] Amsterdam, Eindhoven, Heerlen, Rotterdam, The Hague, Utrecht, Alkmaar, Almere, Amersfoort, Apeldoorn, Arnhem, Breda, Den Bosch, Enschede, Gouda, Groningen, Hilversum, Maastricht, Nijmegen, Tilburg and Zwolle

[299] In Dutch, this is the Ministerie van Infrastructuur en Milieu, abbr. IenM).

During R1, ensuring effective coordination of responsibilities between different administrative bodies in the Netherlands was considered to be a problem. Following changes to the END implementation system with considerable decentralisation since 2010, in R2, coordination appears to remain difficult, given the large number of municipalities involved (91), and the attendant challenges in obtaining data and information.

21.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

21.3.1 Data collection

The Ministry of Infrastructure and Environment has overall responsibility for reporting data to the EEA through the Reportnet system within EIONET. Individual municipalities have been responsible for collecting data in respect of agglomerations since 2007. One of the questionnaire respondents in R1 indicated that the data collection required lots of communication between various departments.

21.3.2 Implementation issues

In relation to the designation and delimitation of transport corridors and agglomerations, only minor implementation challenges were identified in R1. In R2, together with actions taken to address them are shown in the table below.

Table 214 Designation issues - The Netherlands

R1	R2
There were problems with areas or stretches of road and railway that run across municipal boundaries and fall within the scope of more than one CA.	The municipalities are now better aware of delineations in administrative responsibilities, but the large number of municipalities involved can still cause coordination difficulties.

21.4 Noise limits and targets

21.4.1 Objectives and Scope

In the Netherlands, legally binding noise limits are set out in the Noise Abatement Act 1979, as amended in 2007 for noise from industrial estates. Limit values for road traffic and major railways are now set out in the 2012 Environmental Protection Act which introduced changes to noise limits for national (major) roads and railways, which are set out in Chapter 11. These were formerly included in the Noise Abatement Act. When establishing noise limit values, a distinction can be made between the preferential value, which indicates a level consistent with good acoustic living conditions, and the maximum value, which should not be exceeded. Under the Noise Abatement Act as amended in 2012, once municipalities are informed about any proposed physical changes, such as an expansion of a road or a proposed new building development, then the relevant municipality must make projections based on modelling to determine whether the noise level in future will be within the range of the preferred noise limit.

If necessary, municipalities can decide to apply a higher noise limit than the preferred limit provided that the maximum limit is not exceeded and noise levels inside the dwelling, as defined in the Noise Abatement Act, are met.

There are also limit values in relation to aviation, as summarised below:

- The Aviation Act [300], with a recent Amendment[301] for noise from aircraft taking off from and landing at Schiphol airport
- Extension of the 'old' (1958) Aviation Act [302] for noise from aircraft taking off from and landing at other airfields.

The applicable limit values are different for different noise sources. One reason for this is that dose-effect ratios differ for each noise source. Another reason is that cost-benefit analyses have arrived at different conclusions with regard to the level at which noise limit values should be set to strike a balance between public health and economic development.

Preferential and maximum limit values applicable to roads and railways under the Noise Abatement Act are expressed in terms of L_{den} and for industry in terms of L_{ETM} in dB(A), and are provided in the following table:

Table 215 Noise limit values for road, rail and industry - The Netherlands

Legislation and noise source	L_{den} (road, rail) / L_{ETM} (industry)	
	Preferential limit value (dB)	Maximum limit value (dB)
Environmental Protection Act, 2012, Road traffic noise (limits apply to existing roads and new dwellings)	48 (urban roads) 50 (non-urban roads)	63 (urban roads) 65 (non-urban roads)
Environmental Protection Act, 2012. Railway noise (limits apply to existing road and new dwelling)	55 *	68
Noise Abatement Act (as amended 2007) Industrial noise	50 dB(A) (In general, exemptions cannot exceed 55 dB(A))	In certain cases, and subject to strict conditions, exemptions of 60 or 65 dB(A) may be possible

** The reason for the higher limit value is the different dose-effect relation between road and rail traffic.*

Changes were made in 2012 to the limit values for non-urban roads through the Environmental Protection Act. The noise regulations moved from the Noise Abatement Act to the EPA in 2007 (roads and railways). The preferential limit value has been set at 50 dB with a maximum limit value of 65 dB. There are also noise limits for inside buildings. In most cases/situations this limit inside the dwelling is 33 dB.

[300] Aviation Act (18 June 1992), http://wetten.overheid.nl/BWBR0005555/geldigheidsdatum_28-12-2009

[301] Ammendment Schiphol (29 June 2006), http://www.nmanet.nl/Images/VK%20-%2019%20juli%202006%20wet%20luchtvaart_tcm16-89562.pdf.

[302] Extension of the Aviation Act for other airfields (27 December 1990), http://www.st-ab.nl/wettennr02/0194-024_Besluit_geluidsbelasting_kleine_luchtvaart.htm

Derogating the preferential value (which is never higher than the maximum value) was previously a responsibility of the provincial administration which granted exemptions. However, since 1st January 2007, this task lies at local/municipal level and no approval is needed from the provinces to grant such an exemption. Such exemptions are only possible if measures required to achieve compliance with the preferential value are considered unreasonable or disproportionate. Wherever the preferential value is exceeded, requirements will automatically be imposed with regard to the sound insulation of the façade.

In addition to noise requirements imposed on designated industrial estates, there are also noise requirements laid out in environmental permits delivered under the Environmental Management Act (Wet Milieubeheer)[303] which all companies must adhere to. There are no national level rules stipulating common noise requirements; rather the licensing authority (usually the municipality) is responsible for noise requirements. It has become common practice that companies may not generate more than L_{ETM} = 50 dB(A) as measured at the nearest dwellings. If the background noise is less, lower values may also be set in the environmental permit. Higher values are also possible; L_{ETM} = 55 dB(A) is the upper limit. Additional penalties may be imposed for tonal, impulsive and music noise.

However, as part of a long year national programme of 'cutting red tape' and minimising administrative burdens, many activities by SMEs are 'regulated' via general binding rules and SMEs no longer have to apply for an environmental permit. Only the larger, noise relevant-industries (including those regulated by the IPPC) have to apply for a permit which sets specific noise limits.

For aircraft noise around Schiphol airport, 35 "enforcement points" have been designated under the Aviation Act. At these points (located in residential areas in an approximate 30 km radius around the airport), location-specific limit values have been formulated ranging from 52.04 to 59.79 dB L_{den}. There are restrictions on planning new dwellings within a prescribed "limitation area". For other airports, the limit value is B = 35 Ke (B is defined below); no urban development is permitted above this value. 35 Ke corresponds to serious annoyance at 25% of the population exposed to it. For smaller fields, the limit value is 47 BKL.

For railways, according to a report by the UIC[304], The Netherlands has introduced noise-differentiated track access charges.

[303] 1 March 1993, http://www.vrom.nl/pagina.html?id=24176

[304] Railway Noise in Europe, the UIC - www.uic.org/download.php/publication/516E.pdf

21.4.2 Methods for establishing noise limit values

The noise indicator L_{ETM} is used for industrial noise, and is defined as the maximum of the following three values:

- L_{Aeq} over all day periods of a year (7 am to 7 pm)
- L_{Aeq} of all evening periods of a year + 5 dB (7 pm to 11 pm)
- L_{Aeq} of all night periods of a year + 10 dB (11 pm to 7 am)

The value is determined on the basis of the noise-generating rights of a company as laid down in their respective environmental permit. These usually relate to what is termed the Representative Company Situation (in Dutch abbreviated RBS), which is a worst-case situation (in which the 12 most extreme days in terms of noise generation are not taken into account as they are considered non-representative incidents). The RBS is in most cases not equal to the annual average.

The impact of weather conditions on noise levels is determined as a long-term average. For this purpose, no distinction is made between possible differences between day, evening and night. Unless otherwise indicated, noise levels are determined at the façades of dwellings and other noise-sensitive buildings. Only incident sound is taken into account. Sound reflection against the façade for which noise levels are determined is disregarded.

For aircraft noise around Schiphol airport, the noise limit values are expressed in terms of L_{den}. The limit values are recorded per residential area in the surroundings of Schiphol airport. Limit values also apply in respect of L_{night}. For other major airports in the Netherlands, "noise in Kosten units" is taken as the indicator, which is defined as follows:

$$B = 20\log\left(\sum_{i=1}^{n} g_i 10^{Li/15}\right) - 157$$

whereas L_i is the maximum level on the ground during the passage of aircraft *i*, *n* is the total number of aircraft per 24 hours, and g_i is a penal factor varying from 1 in the day time to 10 during night time. The following (rough) rule of thumb can be used: L_{den} = 0,5 x B + 40. The level B is used for larger aircraft. For smaller aircraft an additional quantity BKL is used.

21.4.3 Associated enforcement and mitigation measures

Zoning became an important principle under the Noise Abatement Act in order to regulate noise annoyance. Noise zones became compulsory for noise sources such as industry, road traffic, and railways. The zoning system creates a strong association between noise abatement and spatial planning. Thus, noise policy focuses on protecting noise sensitive buildings such as dwellings, schools and hospitals, plus designated quiet areas.

The Noise Abatement Act allows scope to prioritise possible noise abatement measures in the following hierarchical order:

- Abatement at noise source (silent machines; noise absorbing asphalt);
- Measures between source and receiver(s) (barriers);
- Measures in buildings (sound insulation) that are noise sensitive.

The Traffic Noise Remediation Office (Bureau Sanering Verkeerslawaai (BSV)) works with the national CA to implement measures to reduce noise from roads and rail. In the case of road traffic noise, most costs are for noise barriers and insulation of dwellings, and the government pays for these measures. Most noise barriers have been built alongside motorways. This is rarely possible in towns and cities, where soundproofing insulation is used instead.

21.4.4 Implementation issues

In relation to noise limit values, one of the main problems identified is that there is very little enforcement activity if maximum binding noise limit values are exceeded. This applied in both Rounds 1 and 2.

21.5 Quiet areas

21.5.1 Overview

In the Netherlands, the total surface of Quiet Areas is 650 hectares. This includes a few large wetlands. Quiet areas ("stiltegebieden") are natural areas where no 'disturbing sounds' are allowed) to disturb the prevailing natural sounds. Areas include those designated as protected nature reserves or national natural areas, and areas designated under the Ramsar Convention of 1971 (habitats for water birds).

The Dutch Noise Act distinguishes between two kinds of quiet areas: those designated by law as nature reserves (including Natural Parks) and those identified as designated quiet areas by municipalities. Larger natural areas protected as quiet areas through the Environmental Protection Act (EPA) are designated by the provinces. Environmentally protected areas are also regulated in Dutch environmental permits under the 2012 Environmental Management Act. The total size of these areas is 650 thousand hectares in 2012 (source: Inter Provincial Overleg (IPO) www.atlasleefomgeving.nl). However, these are not the same as – but are often confused with - quiet areas (see implementation issues). General information about the numbers and area of designated quiet areas under the END is not available in the Netherlands at the national level.

General information about numbers and area of quiet areas according to the END are not available.

According to the Dutch Health Council, "agreeable sounds must be distinguished from unwanted noise, when assessing the quietness of areas. For desirable sounds, *i.e.*, natural sounds and other sounds that are appropriate to an area, there is no limit in level or duration of these sounds. When high levels of wanted sounds do exist, such as in a sports or musical event, it need not be quiet, though the acoustic quality can still be high[305]. "For non-continuous noises, such as a car passing through an otherwise quiet area, the percentage of time during which that noise is audible seems to have more influence on the experience of quietness than the actual noise level".

A national methodology has been developed for defining and selecting 'stiltegebieden', but this methodology is not applicable to quiet areas situated in agglomerations.

There are some examples of good practices, e.g. the municipalities of Amsterdam and Rotterdam have been involved in a project funded through Life+ to protect acoustic quality where it is good.

[305] http://www.mdpi.com/1660-4601/9/4/1030/pdf

21.5.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with new issues raised during R2.

Table 216 Quiet area – implementation issues

R1	R2
Overall, quiet areas have had a positive impact. There was already a system for the designation of quiet areas in The Netherlands. No surveillance takes place to check whether prohibited activities has taken place in designated Quiet Areas; Even when inspections did take place, no enforcement activities were carried out by the police or park keepers; In granting environmental permits to enterprises near or within Quiet Areas, the specific conditions and any development limitations in Quiet Areas were not adequately taken into account. Spatial planning often didn't take the conditions and limitations set in the legislation into account either. Lack of promotion of Quiet Areas (e.g. absence of road signs where to find these areas); Walking and biking routes along or through the Quiet Areas (Quiet Areas biking or hiking trails) are not installed too.	Within the provinces, the focus has switched in R2 to tackling the problem of noise hotspots because they are already very familiar with the protection of quiet areas. However, almost nothing was said about quiet urban areas in many NAPs in R1 / R2. However, there are examples of emerging good practices (e.g. in Amsterdam and Rotterdam) There are some examples of the protection of quiet areas at municipal level in urban areas but there remain challenges compared with the designation of quiet areas in rural areas which is not a problem at all.

21.6 Strategic noise mapping

21.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 is shown below.

Table 217 SNMs – The Netherlands

	R1	R2
Agglomerations	6	21
Major airports	1	1
Major railways	424 km	3,503 km
Major roads	854 km	854 km

There was an increase from 6 to 15 in the number of SNMs produced between R2 and R1. In R1, the following agglomerations produced SNMs: Amsterdam, Den Haag, Eindhoven, Heerlen, Rotterdam and Utrecht. In R2, this was extended to include in addition the following: Alkmaar, Almere, Amersfoort, Apeldoorn, Arnhem, Breda, Den Bosch, Enschede, Gouda, Groningen, Hilversum, Maastricht, Nijmegen, Tilburg and Zwolle.

SNMs for all the above transport types are available from: http://www.infomil.nl/onderwerpen/hinder-gezondheid/geluid/actieplannen-0/.

21.6.2 Data collection

In R1, SNMs were prepared using the national interim methods. The interim methods used were ISO-9613 for industrial noise, XPS for road traffic noise, RMR for railway traffic noise and ECAC 29 for air traffic noise. In R2, SNMs for road and rail traffic noise were produced using the Dutch SKM2 calculation method[306], which can be considered as an efficient implementation of the Dutch standard methods for calculating road and rail traffic noise.

Input data for noise calculations was obtained from GIS data, and through visual inspection. Data on the numbers of dwellings were also difficult to obtain. Data files with ZIP codes were employed. Traffic data is generally based on counts with default assumptions for the composition and distribution over time; generating a source of uncertainty. The EEA's *'2007 Good Practice Guide for Strategic noise mapping'* was used, as well as the WG-AEN position paper *'Presenting Strategic noise mapping information to the public'.*

Responsibility for data collection lies at different administrative levels. The national CA has overall responsibility for coordinating the development of SNMs, Rijkswaterstaat and the provinces and cooperate in the development of SNMs for major roads, the Dutch railways company, Prorail for major railways, etc. The Schiphol airport operator is responsible for airports. The Dutch national road authority is the CA for highways, the provinces for major roads outside agglomerations, and municipalities for roads inside agglomerations.

During R1, there were coordination challenges between different administrative levels in collecting input data to facilitate Strategic noise mapping was a major problem. Specific types of input data for noise calculations were difficult to obtain, such as data on barriers, road pavement and buildings. However, these problems appear to have been overcome.

In R2, some coordination challenges remained but stakeholders acknowledged there was greater familiarity with the process of Strategic noise mapping.

In accordance with the Directive, in both L_{night} and L_{den} were used for Strategic noise mapping. Also the indicator L_{Aeq}(0-24h) was used. No further national indicators were used.

21.6.3 Public accessibility of SNMs

SNMs are available on various websites, maintained by the municipalities. For example, the SNM of Amsterdam can be viewed on a website of the city of Amsterdam.[307]

In R1, in the Milieu report, it was commented that the "methods used for public consultation were rather conventional, with the public being made aware of consultation meetings through advertisement in local newspapers. Participation by the public in these events was reported by the Dutch authorities as being generally disappointing".

[306] http://www.stillerverkeer.nl/

[307] http://www.dmb.amsterdam.nl/wat_doet_dmb/advies_en_beleid/geluidadvies

During R2, there appear to have been similar issues, with a difficulty in attracting participation in public consultation. Although Utrecht actively involves citizens in consultation panels on other topics (both online and through the organisation of working groups e.g. to develop a new energy strategy), there has not specifically been anything on environmental noise. Rotterdam has tried to involve citizens but did not succeed in attracting more than 10 people during the 2nd round of Noise action planning.

21.6.4 Implementation issues

The main implementation challenges raised in R1 and R2 are summarised below.

Table 218 Strategic noise mapping issues – The Netherlands

R1	R2
Ensuring effective coordination between different administrative bodies, especially for agglomerations, where there are 60+ local municipalities involved and several municipalities within different cities. Data collection and obtaining input data. The lack of national or EU guidance as to how to aggregate the contributions of various noise sources (multiple exposure).	Lack of comparability of SNMs in R2 since a new tool for calculating and modelling noise was used and this meant that there was an increase in population exposure between Rounds with more sleep disturbed and highly annoyed people. Cities had invested a lot of money on noise abatement measures, such as quiet pavement surfaces. But the results did not show a positive evolution. Better tools are needed to evaluate the impact of investment. Lack of comparability between Rounds is also because between 1st and 2nd round, a lot of time and money was invested to improve input data. For example during the first round Rotterdam applied the suggested multiplier of 2.3 inhabitants per dwelling. During the second round more data from the statistical bureau was available and learnt that the average number is 2.5 instead of 2.3 This resulted in higher numbers of (highly) annoyed and (highly) sleep disturbed people. Limited changes to modelling and input data result in completely different outcome data.

21.7 Noise action planning

21.7.1 Overview

An overview of NAPs is shown in the following table.

Table 219 NAPs – The Netherlands

	R1	R2
Agglomerations	6	21
Municipalities	43	87
Major airports	1	1
Major railways	1	1

	R1	R2
Major roads	1	1[308]
Rijkswaterstaat	1	
Provinces	12	1
		10

The CA was not able to provide data and the EC database on NAPs was only provided for agglomerations and major airports, but not for major railways and major roads.

Agglomerations are somewhat difficult to quantify in the Netherlands because CAs not only drew up NAPs for 21 agglomerations but also for 96 municipalities within these agglomerations. Across the 96, 43 NAPs have been submitted for Round 1.

21.7.2 Methodologies for noise action planning

The national authorities have prepared a 'manual' for drawing up and implementing NAPs. National guidelines have also been established (the "Handreiking omgevingslawaai"). The most recent 2011 guidelines are available from the web link in footnote[309].

The 2012 maps were used as a basis for developing the NAPs in 2013-2014, with the NAPs being based on the identification of 'hot spots' in SNMs. However, hotspots generally identify locations with a high noise exposure, but often a relatively small number of people are exposed to high levels. Addressing hot spots was not seen as being that helpful in terms of reducing overall exposure to potentially harmful noise levels.

21.7.3 Measures

In R2, examples of the types of measures mentioned in NAPs include: traffic planning to tackle road congestion, measures to promote more sustainable transport, noise insulation measures in dwellings located near noise hotspots, among others. There has also been a strong focus on low noise road surfaces. Specifically, the provinces have made extensive use of this abatement measure. In addition, several municipalities have changed road pavements into quieter types.

21.7.4 Public consultations

In accordance with the requirements under the END, there is a requirement in Dutch legislation that citizens have to be kept informed about Strategic noise mapping, the content of actions plans and proposed measures. The legal base is the General Government Justice Act (*Algemene Wet Bestuursrecht,* Section 3.4).

Draft NAPs are made available online. In terms of the timeframe for carrying out public consultation, the draft NAP must be made available for at least six weeks. All citizens and civil society organisations are able to provide their opinions during this period. Public consultations have been carried out in the Netherlands in different ways, for instance, by holding public meetings, establishing committees formed of different organisations, such as residents' or community-based organisations and local environmental and conservation organisations. In a few municipalities, there is a legal arrangement in place to facilitate / structure a process of interactive policy making.

[308] Covering 12 provinces. NAPs for 2 provinces still not submitted yet.

[309] http://www.enschede.nl/loketten/lokettensubsectie/handreiking_omgevingslawaai_2011.pdf/

At municipality level, local councils play an important role in the development of NAPs and in promoting public participation. Municipalities are meant to take responses from the public into consideration in their decision-making processes during the participation procedure.

However, the research found that there has often only been minimal participation in public consultations. In larger Dutch cities, it has been especially difficult to attract participation. An example of how difficult it can be being provided on Rotterdam. Despite a lot of promotion through the involvement of local media and the publication of publicity materials about NAPs on websites, it has been difficult to attract interest from the public. For instance, a consultation evening was organised where only 1-2 people came. The quality of consultation input is important. Local action groups in rural areas are more interested in participating.

The Dutch Society of Noise Nuisance (Nederlandse Stichting Geluidhinder, NSG) is an example of a relevant organisation in The Netherlands able to provide technical input to public consultations on noise -related issues. However, in practice, it has not been that closely involved, but rather influences the development of national noise policies and legislation.

21.7.5 Implementation issues

A summary overview of the main issues raised in relation to Noise action planning in The Netherlands as a result of END implementation in Rounds 1 and 2 is presented in the table below:

Table 220 Noise action planning issues - The Netherlands

R1	R2
Lack of synchronisation between timetable for Noise action planning and periodic governance schedules at national level, such as city council governance plans and budgetary planning. The lack of noise abatement options at local level. The period between finalising SNMs and the development of NAPs of 12 months was regarded as too short. Identifying financing for the implementation of measures mentioned in NAPs was a problem. Difficulties in ensuring coordination between the different organisations responsible for implementing measures mentioned in NAPs.	The period between finalising SNMs and the development of NAPs of 12 months was still regarded as too short. Synchronisation between the development of NAPs and related activities, such as air quality NAPs, would be helpful. Difficulties remained in ensuring coordination between different organisations responsible especially at the local municipality level.

22. POLAND

22.1 National implementing legislation for END

22.1.1 Legal implementation

This sub-section sets out:

- General legislation transposing the Directive;
- Additional implementing acts and specific national implementation provisions.

The main legislative act regulating issues relating to environmental noise in Poland is the Environment Protection Law Act of April 27 2001 (as amended)[310,] especially Articles: 117, 118 and 179. According to Article 112a, protection from noise exposure is defined as "providing the most accurate conditions for the acoustic climate by maintaining the level of noise which does not exceed admissible values".

In addition, there are a series of further decrees and ordinances that set out more detailed implementation arrangements. Noise limit values are set out in the Ministry of the Environment's Ordinance of 14 June 2007[311] (as amended – change in noise limits in 2012)[312]. The limit values are described in details below in chapter 1.4.1 and 1.4.2. A further relevant regulation is the Ministry of the Environment Ordinance of 16 June 2011 (as amended)[313] which sets out the requirements in respect of environmental noise measurement, and Ministry of the Environment Ordinance of 19 November 2008 (as amended)[314] which specifies the standard formats for documenting and presenting the results of noise measurements.

A decree was adopted by the Polish Ministry of the Environment on October 1, 2007[315] with regard to the data range that should be included and presented in SNMs (further details are provided in the strategic noise mapping section).

22.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Poland included 12 agglomerations, one major airport (Warsaw), and approximately 1005 km of major roads and 66 km's of railway. There are two major roads with over 6 million cars per year.

The introduction of definitive thresholds in R2 led to 23 *additional* agglomerations (i.e. a total of 35 in R2) being included, and approximately 1 215 km of major railway lines and 9 710 km of major roads being covered.

[310] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20010620627
[311] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20140000112
[312] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20120001109
[313] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20111400824
[314] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20111400824
[315] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20071871340

Table 221 END coverage – Poland

Round	Agglomerations	Major airports	Major rail	Major roads
1	12	1	66 km	1,005 km
2	35	1	1,215 km	9,710 km

Source: Report on the state of the environment acoustic based on the results of SNMs, GIOŚ Warsaw, Poland 2013

SNMs and NAPs were prepared for sections of major roads inside and outside of agglomerations in Rounds 1 and 2. For major railways, no major sections had more than 60,000 movements per year (R1) but an NAP was prepared for R2. NAPs summaries e.g. for the municipalities of Gdynia, Poznań, Wrocław and NAPs summaries for major roads outside the municipalities in Świętokrzyskie province are available in xml file format online[316, 317].

22.2 Competent Authorities and designated administrative bodies

In Poland, the Ministry of Economy has overall responsibility for the implementation of the Environmental Noise Directive. Noise control in Poland is the concern of the Committee on Acoustics of the Polish Academy of Sciences and the Polish Acoustical Society, which organises International Noise Control Conferences. Road, rail and airport authorities and municipalities are responsible for Strategic noise mapping and NAP development.

Table 222 Administrative Responsibility for the END - Poland

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipality Administration and Council of cities	General Directorate of National Roads and Motorways in Poland (GDDKiA), Boards of Provincial Roads in Poland and Privet Companies e.g. Gdańsk Transport Company S.A., *Stalexport* Motorway S.A.	Polish Railways (PKP PLK)	State Enterprise "Airports" Warsaw
Approving SNMs				
Preparing NAPs				
Approving NAPs				
EC/EEA reporting	Ministry of Environmental Protection			

With regard to municipalities, the responsibilities are allocated the following way:

a) 9 cities (urban)> 250 000 inhabitants: Bialystok, Bydgoszcz, Gdańsk, Lublin, Łódź, Kraków, Poznań, Warsaw, Wrocław.

26 cities > 100 000 inhabitants (than 250 000 inhabitants): Bielsko-Biala, Bytom, Chorzów, Częstochowa, Dąbrowa Górnicza, Elbląg, Gdynia, Gliwice, Gorzów Wielkopolski, Kalisz, Kielce, Koszalin, Legnica, Olsztyn, Opole, Płock, Radom, Ruda Śląska, Rybnik, Rzeszów, Sosnowiec, Toruń, Tychy, Włocławek, Zabrze, Zielona Góra.

[316] http://cdr.eionet.europa.eu/pl/eu/noise/df7/envsxrtcq/

[317] http://cdr.eionet.europa.eu/pl/eu/noise/df10/

22.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

22.3.1 Data collection

The Law on Noise Management of Poland transposes the END's definitions of agglomerations, major roads, major railways and major airports. Agglomeration borders are aligned with the administrative borders of cities with more than 100,000 inhabitants. The number of inhabitants for each city is publicly available from statistics in Poland.

Data to delimit major roads, major railways and major airports are available from the Poland Road Administration (GDDKiA, ZDW), Polish Railways (PKP PLK) and Civil Aviation Administration (governmental institutions under the Ministry of Infrastructure in Poland) respectively.

22.3.2 Implementation issues

Issues raised as a result of END implementation in R1 in Poland are illustrated below. Issues raised in R2, together with actions taken to address them are shown in the table below.

Table 223 Designation issues

R1	R2
Lack of a common methodology for performing the SNMs (SNMs) and NAPs (NAPs); Guidelines prepared by the Chief Inspector for Environmental Protection in Poland (2006)[318] appeared as some SNMPs have already done; Lack of experience in preparing SNMs and NAPs for most performers; Difficulties with the appointment of sections of major roads and railways for whom to be performed SNMs.	The Regulation of the Minister of the Environment of 1 Oct. 2007 does not clearly define the data range that should be included and presented in SNMs319, which caused a lot of problems in the interpretation of the regulations; Wide range of mapping e.g. over 9 710 km of national roads, 1215 major rail and 35 agglomerations in Poland (R2), Change in the noise limit values between the stage of performing SNMs and proceeding to execute NAPs; Guidelines prepared by the Chief Inspector for Environmental Protection in Poland June 2006 and 2011; Many trainings and conferences were the results of R1 SNM were presented organized in the period between end of R1 and beginning of R2 SNMs;

[318] *Acoustic Maps design guidelines*. Development of preparation by the Institute of Environmental Protection ordered by the Chief Inspector of Environmental Protection, June 2006.

[319] http://isap.sejm.gov.pl/DetailsServlet?id=WDU20071871340

22.4 Noise limits and targets

22.4.1 Objectives and Scope

During R1, noise limit values in Poland were set out in the Ministry of the Environment's Ordinance of 14 June 2007 (as amended).

Table 224 Long term noise limit values in force in Poland (R1 of Strategic noise mapping)

Type of area	Roads or rail way		Other facilities and activities being the noise sources	
	L_{DWN}	L_N	L_{DWN}	L_N
Health centres, hospitals located outside city centres	50	45	45	40
One-family houses, hospitals located in cities	55	50	50	40
Multi-family houses, one-family houses serving as artisans' workshops, recreation areas outside cities, farm buildings	60	50	55	45
City centres in cities with more than 100,000 inhabitants, with buildings close together and a high density of administrative and commercial buildings	65	55	55	45

In R2, in October 2012, a new not so restrictive noise limits were set out in the Ministry of the Environment's Ordinance of 8 October 2012 (amending the regulation on permissible noise levels in the environment)

Table 225 Long term noise limit values in force in Poland (R2 of Strategic noise mapping)

Type of area	Roads or rail way		Other facilities and activities being the noise sources	
	L_{DWN}	L_N	L_{DWN}	L_N
Health centres, hospitals located outside city centres	50	45	45	40
One-family houses, hospitals located in cities	64	59	50	40
Multi-family houses, one-family houses serving as artisans' workshops, recreation areas outside cities, farm buildings	68	59	55	45
City centres in cities with more than 100,000 inhabitants, with buildings close together and a high density of administrative and commercial buildings	70	65	55	45

22.4.2 Methods for establishing noise limit values

EU interim methods have been used to determine noise levels, and noise levels are determined by calculation (Popp, nd). Information on acceptable noise levels is to be found in the Ordinance of the Ministry of Environment, issued in 14 June 2007 (R1) and issued in October 2012 (R2). As a result, during R1, less-acceptable levels of noise were obtained than during R2.

In Poland, for major noise sources e.g. roads, railways and airports, the choice of 'Action Level' was left at the discretion of the Noise action planning body i.e. the local authorities. The "M indicator" is used, which takes into account the value of exceedance of noise limit values and the number of people exposed to noise living in a particular area. NAPs take into consideration areas where the "M" indicator is above 0 and specific actions to protect them have been identified. The formula for the "M" indicator co-efficient is: M = 0.1 m (100.1ΔL - 1) where: M "M" indicator value:

- ΔL Noise excess value in dB,
- m Number of people exposed to noise over the limits.
- In order to determine the M indicator in some NAPs L_{den} was used whilst in others L_{night} was used (Ministry of the Environment's Ordinance of 14 October 2002).

Binding legislation only defines the formula for the "M" indicator, but does not stipulate the level or how areas should be prioritised. However, most NAPs have adopted a pragmatic approach in which greatest priority has been dedicated to areas where the "M" indicator is >50. The areas with "M" indicator value over 50 are most exposed to noise, which have top priority in being provided with equivalent noise mitigation measures.

Table 226 Limit values for force in Poland (R2 of Strategic noise mapping)

Type of area (Land-use type)	Roads or rail way		Other facilities and activities being the noise sources	
	L_{day}	L_{night}	L_{day}	L_{night}
Health centres, hospitals located outside city centres	50	45	45	40
One-family houses, hospitals located in cities	61	56	50	40
Multi-family houses, one-family houses serving as artisans' workshops, recreation areas outside cities, farm buildings	65	56	55	45
City centres in cities with more than 100,000 inhabitants, with buildings close together and a high density of administrative and commercial buildings	68	60	55	45

22.4.3 Associated enforcement and mitigation measures

The main obligations for Polish railways are to ensure that noise is kept at or below noise limit values, and to reduce noise to the limit (or below) if the limit is exceeded. The noise abatement programme on the Polish railway network includes:

- Track grinding as part of day-to-day maintenance, with the annual programme veering aR1000km with an annual budget of EUR3.9m;
- Noise barriers and anti-vibration equipment;
- Monitoring noise emissions or drawing potential SNMs; and
- There are currently 6 railway line modernisation projects with noise abatement programmes.

Railway line modernisation has included the costs of 50 km of noise barriers (EUR47.3m), 10,000 noise-insulation windows, and the total project costs are estimated at EUR90m to 2013. Noise measurements are mandatory in the event of modernisation of railway lines and noise from railway operations must be periodically measured. SNMs should be completed every 5 years for railways but this is not a legal requirement[320].

The noise limits values are enforced by local authority e.g.:

a) Regional Directorate for environmental protection - on the stage of administrative procedure for obtaining environmental permits (Information Cards of Investments, EIA Reports),

b) Department of Environmental Protection Marshal's Office - e.g. on the stage of procedure for establishing Areas of Limited Usage,

c) Provincial Environment Protection Inspectorate - on the stage of acoustical environmental monitoring.

22.4.4 Non-binding target values

There are no non-binding targets.

22.4.5 Implementation issues

Issues were only raised in R1:

- Difficult to adapt Polish law to European standards
- Difficult to adapt national noise calculation methods to be compatible with those required through the END.
- Setting appropriate noise limit values was also challenging, given the absence of such limit values in the Directive and the fact that there was no previous experience in Poland in setting national limit values.

[320] International Union of Railways (UIC) and Community of European Railway (CER) (2007): Status Report 2007:
Available at: www.cer.be/force-download.php?file=/media/publications/EN_Noise_Reduction.pdf.

22.5 Quiet areas

22.5.1 Overview

No quiet areas were designated in Poland during either R1 or R2.

With regard to the criteria used for the delimitation of, there is a common methodology at national level for the definition of quiet areas. Quiet areas outside of agglomerations are areas free from roads, rail, industry and recreational noise. Current land use and future land use both on the site and in the vicinity are used as criteria for delimitation.

Based on the Polish Environmental Law (Art. 118b) 1. County councils may by resolution, designate quiet areas in agglomerations or quiet areas outside urban areas relating to the specific noise protection needs of these areas and give requirements to ensure that noise levels are maintained at least at the existing level. 2. The draft resolution, referred to in paragraph. 1, subject to the agreement of the local mayor, the mayor has up to 30 days to raise an objection to a responsible authority within this period. If no such objection is received, then this is considered to mean that the draft resolution has been approved.

The definition of quiet areas described above was obligatory during noise mapping in R1 and R2.

L_{den} was used as the main indicator both within and outside agglomerations in both Rounds 1 and 2.

22.6 Strategic noise mapping

22.6.1 Overview

An overview of SNMs produced in R1 and R2 is shown below.

Table 227 SNMs (SNMs) - Poland

	R1	R2
Agglomerations	12	35
Major airports	1	1
Major railways* **	3 (66 km)	30 (1 215 km)
Major roads * **	97 road sections (1005 km)	2,000 road sections (9 710 km)

** - SNMs for 3 main railway lines were prepared. These have a total length of 66 km and 97 different sections of national roads in Poland with total length 1005 km,*

*** SNMs for around 30 main railway lines with total length of 1 215 km and 2 000 different sections of national roads (7 850 km) and voivodship roads (1 860km) in Poland. The total length of road mapped is 9 710 km.*

The Environmental Protection Law, which transposed the END into national Polish legislation, requires local authorities in Polish cities to include the results from strategic noise mapping in spatial planning processes and procedures and in the development of conclusions and recommendations. . SNMs should then provide the basis for the development of Local Land Use Plans and administrative decision-making. In accordance with the act, local plans must include consideration of planning issues. This includes the need to protect the population from noise exposure and to preserve noise quality where it is good. Links between the development of SNMs and local land use plans in Poland have been highlighted in various documents[321].

22.6.2 Data collection

According to a decree adopted by the Polish Ministry of Environment on October 1, 2007, a SNM should consist of both a descriptive part and a graphical presentation of the map. The first part should include the characteristics of an area, the acoustic features included in planning documentation of a commune, the identification and specification of noise sources as well as the identification of quiet areas that are "at risk" of being affected by environmental noise. The visual part is represented by numerous maps depicting the acoustic climate of a researched area which may include: noise emission maps, conflict SNMs as well as indicators relating to the number of inhabitants subject to excessive noise exposure. Additionally, the map includes quiet areas where excessive sound levels have been identified with the L_{den} indicator.

Responsibility for data collection lies with the designated responsible authorities, which are: Inspector for Environmental Protection overall, General Directorate of Roads and Motorways in Poland, private companies: Autostrada Wielkopolska S.A, Gdańsk Transport Company, Stalexport Autostrada Małopolska S.A. and Regional Roads and Mayors with county rights for major roads, Polish Railways for major rail and Presidents of Cities for agglomerations.

In order to help local authorities in carrying out Strategic noise mapping, some support has been provided through projects to provide support and guidance to local authorities. One such project was the project "a network-based system for supporting the administrators of strategic acoustic maps of urban areas", financed by the Polish National Centre for Research and Development (NCBiR).

22.6.3 Strategic noise mapping methods

The SNMs were produced using the following data:

- Annual average parameters and conditions on road, tram and railway traffic, divided by day, evening and night;
- Location of roads, trams and railway lines;
- Geographical and economic data including building heights;
- Demographic data;
- Meteorological data; and
- Emission and propagation data.

[321] IMPLEMENTATION OF THE EU NOISE DIRECTIVE IN PROCESS OF URBAN PLANNING IN POLAND, J. Kwiecień a, K. Szopińska.

Based on this data, at least one agglomeration map was produced with acoustic fields layout along the major roads and junctions, and including natural and artificial screens and green belts. This allowed for determination of noisy areas and led to recommendations about reducing the noise in these locations. Measures adopted to obtain acoustics data for Strategic noise mapping in Poland are listed below.

Table 228 Strategic noise mapping measures - Poland

	Description
Metrics	L_{Aeq} (L_{day}, L_{night}) Reference periods are day (6-22) and night (22-6) L_{Aeq} is often calculated from L_{AE} measurements when the traffic is low and in relation to rail noise
Frequencies	A-weighted
Type of measurements	Measurements at the source Measurements at the receiver Combinations of measurements and calculation are included Reference is made to national prediction methods
Microphone positions above ground	Generally based on the Ministry of the Environment's Ordinance of 16 June 2011: measurement points should be located in areas protected from the noise in such a way that they performed measurements allowed us to determine the place of greatest impact of noise on people in their place of residence of the possible sources from which measurements relate to the following rules: a) on the open road measuring points locates at a height of not less than 1.5 m above ground, b) at the built locates measuring points, depending on the possibilities: • At the facades of buildings to be protected against noise in the discharge of the functions for which the site is implementing protected against noise, at a distance of 0.5 m to 2 m from the facade of the buildings in the light of the window exposed to the noise floor; the permissible noise measurements, as far as possible, the window open, closed or cancelled in such a way as to be able to carry out their boom microphones and cables connecting the measuring of measuring instruments located in the room; • At a height of 4 m ± 0.2 m above ground, where there is no possibility of making measurements of noise in the light of the windows on the floor or in the areas surrounding these buildings;
Microphone positions relative to vertical surfaces	• -
Indoor measurements	• -
Measurement distance	Source measurements: If the road is placed in urban area, microphone should be placed 1m from the road (street) edge. In case of other roads, the distance should be 10m and 20m (according e.g. internal regulations General Directorate National Road and Motorways in Poland). Receiver measurements: At the receiver (height of 4 m ± 0.2 m.)

Source: Ordinance Ministry of the Environment's 16 June 2011 and internal regulations General Directorate National Road and Motorways in Poland

GIS data were used as overlays for conflict maps, and statistical methods were used to link inhabitants and dwellings. Aerial photographs, on-site surveys, conduction of measurements and calculations were also used to gather data for SNMs.

22.6.4 Public accessibility of SNMs

Noise maps for National Roads in Poland are presented on the web site of the General Directorate of National Roads and Motorways: https://www.gddkia.gov.pl/pl/1811/Mapy-akustyczne-dla-drog-krajowych-o-ruchu-powyzej-3-000-000-pojazdow-rocznie or on the Government web site: http://geoserwis.gdos.gov.pl/mapy/.

Noise Maps are delivered to the local authority e.g. Sanitary Inspectorate and District Offices in Poland. In this places (local authority) local society is able to see the prepared documentation (Noise Maps) and check the results of noise calculation. When the local society has some questions, remarks to the Noise Maps report it to the local authority. In this case local authority based on Polish Environmental Law is able to start the new environmental procedure e.g. Environmental Review. The result of this administrative procedure is confirmation or negation the results of noise analysis presented on the Noise Maps based on the noise measurements and new noise calculation.

In Poland, SNMs are available through the following links:

I. Examples of noise maps for 12 Cities in Poland (R2):

1. Mapa akustyczna Warszawy (http://www.akustyczny.pl/linki/50-mapyakustyczne/16-mapaakuwarszawa)
2. Mapa akustyczna Białystok (http://www.gisbialystok.pl/gis-bialystok/app/menupage.jsp)
3. Mapa akustyczna Wrocławia (http://gis.um.wroc.pl/imap/?gpmap=gp2)
4. Mapa akustyczna Gdańska (http://www.gdansk.pl/srodowisko,1244,9475.html)
5. Mapa akustyczna Gdyni (http://server.miasto.gdynia.pl/GeoSerwer/e-mapa.htm)
6. Mapa akustyczna Poznania (http://www.poznan.pl/mim/public/wos/pages.html?co=list&id=11105&ch=11745&instance=1017&lang=pl)
7. Mapa akustyczna Krakowa (http://mapa-akustyczna.um.krakow.pl:280/mapa_k/mapa.php)
8. Mapa akustyczna Łodzi (http://www.akustyczny.pl/linki/50-mapyakustyczne/21-mapaakulodz)
9. Mapa akustyczna Katowic (http://bip.um.katowice.pl/index.php?s=16&id=1227080023)
10. Mapa akustyczna Lublina (http://www.akustyczny.pl/linki/50-mapyakustyczne/25-mapaakulublin)
11. Mapa akustyczna Szczecina (http://bip.um.szczecin.pl/UMSzczecinBIP/chapter_50377.asp)
12. Mapa akustyczna Bydgoszczy (http://www.akustyczny.pl/linki/50-mapyakustyczne/29-mapaakubydgoszcz)

II. SNMs for main roads and motorways in Poland (R2): Portal map akustycznych GDDKiA (http://www.akustyczny.pl/linki/50-mapyakustyczne/28-mapygddkia and http://mapy.geoportal.gov.pl/pomoc/ or http://mapy.geoportal.gov.pl/imap,)

III. For main railways in Poland (R2): http://mapa.plk-sa.pl/ Implementation issues

During the testing of Strategic noise mapping technologies with administrators responsible for the development of SNMs in agglomerations, it became clear that local municipality staff directly involved in Strategic noise mapping lack the competences required either for the process of creating SNMs or for exploiting the findings, such as identifying appropriate measures at local level to reduce and / or mitigate noise exposure through Noise action planning based on the results of SNMs[322]

22.7 Noise action planning

22.7.1 Overview

An overview of the number of NAPs in Poland is shown in the following table.

Table 229 NAPs – Poland

	R1	R2
Agglomerations	10	40
Major airports	0	0
Major railways	3 (66 km)	30 (1,215 km))
Major roads	97 (1,005 km)	2,000 (9,710 km)

** - NM for 3 main railway lines with total length of 66 km and 97 different sections of national roads in Poland with total length 1005 km,*

*** - NM for around 30 main railway lines with total length of 1 215 km and 2 000 different sections of national roads (7 850 km) and voivodship roads (1 860km) in Poland with total length 9 710 km*

**** - AP prepared by regional offices of 16 provinces in Poland*

22.7.2 Methodologies for noise action planning

"Index M" has been used, which is a coefficient that links the number of people exposed to noise with noise levels. This was used for creating the NAPs, along with exceedance maps for change in L_{den} and L_{night}. The noise threat indicator was also used; this is a function of noise above permitted level and number of inhabitants endangered.

22.7.3 Measures

A wide diversity of different types of noise reduction and mitigation measures were included in NAPs. During R1, these include among others, traffic control, land-use planning, technical measures at source, economic measures, noise insulation, reduction in noise exposure and regulations. Many NAPs in Poland differentiate between short-term actions, long-term actions and awareness-raising and education measures to raise awareness about the issue of environmental noise.

[322] Collaborative Web-Based System for Knowledge Transfer to Distributed Groups of Users Within Strategic Noise Mapping Domain, Marcin Dąbrowski, Silesian University of Technology, Gliwice, Poland (International Journal of Distributed Systems and Technologies, 4(4), 39-49, October-December 2013)

There have been differences in the approach to the preparation of NAPs in each region, resulting in a high diversity of noise action plans across each of the 16 provinces, for instance in the case of major roads. A report by CEDR from March 2013 highlighted some of the problems encountered[323]. *"Action plans were outsourced by provincial marshals and almost all NAPs were prepared by different companies. Due to many different approaches and methodologies adopted, it is difficult to carry out a comprehensive analysis of the results, aims and recommendations of the plans, at national level".* The estimated costs of implementation were also found to vary. For instance, the costs of noise barriers are expressed differently in each action plan*. "In some NAPs this was the price per square metre, in others a linear metre and in others still the total length of the noise barrier. Moreover, in most cases it is not stated if the cost of barriers includes only the price for erecting them, or if the price includes also the project and the cost of noise analysis".* .In R2, similar types of measures have been identified, with a continued emphasis on integrating noise mitigation measures into local land-use planning (agglomerations) and in the installation of noise barriers (major roads).

22.7.4 Public consultations

Public consultation as part of the development of NAPs in Poland has taken a number of forms. This has included:

- Information about the draft NAP in the media as part of information and awareness-raising campaigns;
- Organising public meetings with citizens;
- Internet-based consultations;
- Organising educational projects regarding noise;
- Making sure information is clear and easy to understand;
- Organising an open appointment and public discussions about problems with urban noise; and
- Cooperation between competent authorities and NGOs.

In terms of feedback on consultations, it was noted by END stakeholders in Poland that internet-based consultations were not found to be an effective approach in obtaining useful feedback. However, feedback received at public meetings had been more useful.

[323] Source: NRAs' practice and experiences with preparation of noise action plans, CEDR, March 2013.

An example of the way in which public consultation has been carried out in Poland is now provided.

In Wielkopolska Voivodeship in Poland in the small city Powodowo based on the results presented in Strategic Noise Maps in R2, local citizens suggested that in one of the allotment areas (these areas are also protected from environmental noise in Poland), noise levels were predicted to exceed the national limit value due to traffic from national road number 32. Once attention had been drawn to this issue through a public consultation meeting under the END, the District Offices in Wolsztyn decided to perform an Environmental Review of this area. General Directorate of National Roads and Motorways in Poland carried out this work to check the results from noise measurement and new noise calculations presented in Noise Maps. The average values in exceedance of the limit were confirmed through this independent assessment to check the accuracy of the mapping results. Consequently, mitigation and noise reduction measures were built in to the NAP specifically to tackle this problem.

22.7.5 Implementation issues

Among the main issues raised in END implementation in R2 were that the noise action planning period of 12 months from the submission of SNM was viewed as being too short (in both Rounds 1 and 2). In addition, there were problems in financing NAPs and a lack of budget to implement measures (also R1 and R2). The heterogeneity of action planning approaches was also found to be a problem in R2, especially for major roads.

Particularly in R1, there was a lack of experience in noise action planning among public authorities. In R2, the position had improved, but some public authorities were involved in END implementation for the first time (due to the change to the definitive END thresholds).There were also coordination challenges, for instance in terms of the difficulties and problems in analysing all the strategic action plans for the national competent authority. In particular, the difficulty was that many NAPs were quite different in approach and methodology and in estimating costs. This meant that it was very difficult to assess the situation across Poland overall. This issue applied in both Round 1 and 2.

23. PORTUGAL

23.1 National implementing legislation for END

23.1.1 Legal implementation

In Portugal, the Environmental Noise Directive has been transposed at national level through the Decree-Law 146/2006, of 31st July 2006[324], relating to the preparation of SNMs, including data collection, the provision of information to the public, and the use of indicators and assessment methodology, and the preparation of NAPs.

Pre-existing noise legislation under Decree-Law 292/2000 of 14 November 2000 was then revoked and harmonised with Decree-Law 146/2006 under Decree-Law No. 9/2007[325] of January 17, as amended by Decree-Law 278/2007[326] of 1st August 2007, which provides for the General Noise Regulation (RGR) and establishes the legal basis for the prevention and control of noise pollution. It is worth noting that, before that, Portugal had a Noise Law since 1987 (approved by Decree Law 251/87) which included environmental noise together with acoustic building requirements.

Although this legislation applies to the whole country, in the case of the Azores, the Regional Legislative Decree 23/2010/A[327] separately transposed the END into the regional law.

23.1.2 Scope of END implementation – Rounds 1 & 2

R1 strategic noise mapping and noise action planning in Portugal was initially thought to cover two agglomerations: Lisbon and Porto. However, the population Porto dropped to just below 250,000 inhabitants and was therefore excluded from R1. The criteria adopted in Portugal to define a large agglomeration for the purpose of application of the END were: a) number of inhabitants, b) a population density of no less than 2,500 inhabitants/km2 and c) location within one jurisdiction.

With regard to transportation infrastructures, R1 covered one airport (Lisbon), 1,743 km of major roads outside the agglomerations and 115 km of major rail.

In R2, the scope of the Directive was extended to *five additional* agglomerations (Amadora, Matosinhos, Odivelas, Oeiras and Porto). There was also a major increase in the amount of strategic noise mapping required for major roads with additional 1,714 km of major roads and 392 km of additional major rail outside agglomerations to be mapped. An additional airport (Porto) has been added in R2.

[324] http://dre.pt/pdf1sdip/2006/07/14600/54335441.PDF

[325] http://www.dre.pt/pdf1sdip/2007/01/01200/03890398.PDF

[326] http://www.dre.pt/pdf1sdip/2007/08/14700/0491204913.PDF

[327] http://azores.gov.pt/NR/rdonlyres/258B9095-20B3-4728-A8EC-48F0FBC4E64A/423089/DecretoLegislativoRegionalN232010A1.doc

An overview of END coverage by Round is provided below:

Table 230 END coverage – Portugal

Round	Agglomerations	Major airports	Major rail	Major roads
1	1[328]	1[329]	115 km	1,743 km
2	6[330]	2[331]	507 km	3,457 km

23.2 Competent Authorities and designated administrative bodies

The Portuguese Environmental Agency[332] (APA) is responsible for reporting to the European Commission and ensuring that relevant strategic noise mapping and noise action planning timelines are met.

The authorities responsible for the SNMs and NAP development are:

- The municipalities of Lisbon, Porto, Amadora, Matosinhos, Odivelas and Oeiras for SNMs and NAPs for their agglomerations;
- EP-Portuguese Road Authority[333], for major roads;
- National Rail Authority (REFER E.P.) for major railways;
- ANA-Portuguese Airport Authority for major airports;
- Portuguese Environment Agency, responsible for approving SNMs and NAPs for major roads, railways and airports.

Table 231 Responsibility for SNMs and Noise action planning in Portugal

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Municipalities (i.e. local authorities)	EP-Portuguese Road Authority[334]	REFER - National Rail Authority	ANA-Portuguese Airport Authority,
Approving SNMs				
Preparing NAPs				

[328] Lisbon

[329] Lisbon Airport

[330] Lisbon
Porto
Amadora
Matosinhos
Odivelas
Oeiras

[331] Lisbon and Oporto Airports

[332] http://www.apambiente.pt

[333] Although EP is officially responsible for application of END for roads, in Portugal there are many roads that are consigned to private operators or to public-private partnerships and, in those cases, these entities are directly responsible to produce and deliver to EP the noise maps and action plans of the corresponding roads. EP is only directly responsible for the implementation of END in the case of national roads that are run directly by EP.

[334] EP and REFER went through a merging process during 2015, so there will be a unique national authority for both roads and rail which is called IP – Infrastructures of Portugal.

Role/Activity	Agglomerations	Roads	Railways	Airports
Approving NAPs				
EC/EEA reporting	APA - Portuguese Environment Agency			

23.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

23.3.1 Data collection

The CAs had difficulties providing data in time to meet the deadline for the designation of sites. For both Rounds, data was more readily available for the identification of major airports, agglomerations and railways, but only for some roads due to the need to compile traffic information for all relevant roads. In a number of cases, specific surveys were required to generate this data.

Cartographic data was generally available in a suitable form for the agglomerations, but for roads and rail specific cartography had to be produced by the responsible entity for the SNMs.

All processes have suffered significant delays, which is generally explained by the financial and economic crisis that has affected the country since 2009 and that forced the CAs to restrict their financial resources.

23.3.2 Implementation issues

A single issue was raised for both Rounds, a summary of which is shown below.

Table 232 Designation issues -

R1	R2
A lack of sufficient human and economic resources	A lack of sufficient human and economic resources

23.4 Noise limits and targets

Noise limit values in force in Portugal are set by Decree-Law No. 9/2007 of January 17, as amended by Decree-Law 278/2007 of 1st August 2007. These limits are shown in the table below.

Limit Values	L_{den}	L_{night}
Mixed zones**	65	55
Sensitive zones*	55	45
Sensitive zones in the vicinity of existing major roads, railways or airports	65	55
Sensitive zones in the vicinity of planned major airports	65	55
Sensitive zones in the vicinity of planned major roads or railways	60	50
Interim values (in force until zone classification is completed by the municipalities)	63	53

Table 233 Noise limit values in force in Portugal

**zones appropriated for housing, schools, hospitals, leisure activities and other community facilities mainly used for rest*

***zones where, along with the above mentioned land uses, there are other uses such as commercial and services facilities*

Noise limit values were already established at the national level before the Directive was adopted and L_{Aeq} (ISO 9613 indicator) for day and night periods were used as noise indicators. With the transposition of the Directive, the evening period and the indicator L_{den} was added, replacing the L_{day} indicator. For that purpose, Portugal established the same obligations as with L_{Aeq} indicators despite changing the measures. The WHO recommendations and health-based assessment were taken into account but were not strictly copied.

According to the APA, the limits will be enforced in the future. The Decree-Law No. 9/2007 classifies as "serious environmental offense" the responsibility for exceeding these noise limits. Sanctions can go up to € 34,000, in case of negligence, and up to € 48,000 in case of wilful action, according to what is established in the Law Framework of Environmental Offenses (Law 50/2006, amended by Law 89/2009). After being notified, the person or legal entity, has 15 days to reply. Deadlines for reducing the noise are set on a case by case basis and can be agreed flexibly depending on the complexity of the situation.

23.5 Quiet areas

23.5.1 Overview

A common methodology was established at national level, with definitions of quiet areas established under Decree-Law 146/2006:

- A quiet area in an agglomeration is an area defined by the city council, proposals and plans under municipal planning exposed to a value of L_{den} less than 55 dB (A) and L_n equal to or less than 45 dB (A) from all noise sources – to be revised every 10 years
- A quiet area in open country is an area defined by the city council, proposals and plans under municipal planning that is not disturbed by noise emissions from traffic, industry, trade, services or recreational activities.

L_{den} and L_{night} were used for the delimitation of quiet areas within and outside agglomerations. A supplementary indicator for the definition of quiet areas outside agglomerations was that they should be residential areas without any industry or major commercial areas, such as large shopping centres.

In practice quiet areas coincide with the classification of Sensitive zones defined in Decree-Law 9/2007 and its delimitation is a responsibility of the municipalities, that must define them in their municipal land use plans, but only when new plans or revision of existing plans occur. Due to this legal framework, and since most of the municipalities have been taking a long time to revise existing land use plans and very few new plans have been launched in the last years, the delimitation of quiet areas has been a very slow process in Portugal, which almost had no impact on the development of SNMs and on the NAPs.

23.6 Strategic noise mapping

23.6.1 Overview

An overview of the number of SNMs produced in Rounds 1 and 2 is shown below.

Table 234 SNMs - Portugal

	R1	R2
Agglomerations	1	2 (6)
Major airports	1	2 (2)
Major railways	6	6 (13) (507 km)
Major roads	58	69 (130) (3,457 km)

**Note – in some countries, SNMs may be available in draft and have been submitted to the EC and the EEA but still not formally adopted by the responsible political decision maker. As such, some R2 NAPs may still not be adopted or published in-country.*

Note: in brackets are the numbers of SNM of R2. Example: number or major roads with 3 to 6 million vehicle passages/year.

Sources: APA and DataFlow2 from REPORTNET

It is worth noting that SNMs have been produced for municipalities and transportation infrastructures since at least 2000, due to the requirement of Decree-Law 29/2000 of 14 November 2000 which obliged every municipality to produce a SNM of the entire area of the municipality. Over 80% of the 308 Portuguese municipalities have produced their SNM according to the 2000 regulation and most of them have already adapted these SNMs to the Decree-Law 9/2007 requirements, according to the END indicators L_{den} and L_n. The requirements for these SNMs, however, are less complex than those defined in the END, as they consist basically on the coloured maps which are to be included in municipal GIS systems for planning purposes, not including normally data on the number of exposed population.

23.6.2 Data collection

In R1, the methods laid down in the END were followed, except for railways data where, in some cases, it was found to be more appropriate to use the Schall03 method rather than the SRMII method.

The limited availability of national data on population by dwelling, with information only available on city apartment blocks, made estimations necessary. In some cases, there was no data on building heights either, requiring experts to actually measure the houses. Finally, measurements to estimate noise emissions from industrial sites had to be done in the field as well as there was no previous data. The EEA 2007 Good Practice Guide was used.

23.6.3 Strategic noise mapping methods

Portugal has developed national guidelines for strategic noise mapping at the national level, available here: http://www.apambiente.pt/index.php?ref=16&subref=86&sub2ref=532

The calculation methods are those defined in the END, although for railways alternative methods can and have be used, such as Schall03, as long as evidence is made of its equivalence to the reference method SRMII.

APA guidelines recommend that the SNMs should be validated by means of continuous noise monitoring for at least 48 h, at some points strategically chosen.

23.6.4 Public accessibility of SNMs

SNMs are available to the public through the Environmental Protection Agency's website, as shown in the table below.

Table 235 Strategic noise mapping locations - Portugal

	SNM location
Agglomerations	http://www.apambiente.pt/_zdata/DAR/Ruido/SituacaoNacional/MapasAglomeracoes/Mapas%20estratgicos%20de%20rudo%20e%20populao%20exposta%20em%20aglomeraes_jan2015.pdf
Roads	http://www.apambiente.pt/_zdata/DAR/Ruido/SituacaoNacional/Mapas%20GITs%20Rodoviario/MER%20GITs%20Rodo%20versao%20Jan2015.pdf
Railways	http://www.apambiente.pt/_zdata/DAR/Ruido/SituacaoNacional/Mapas_GITs_Ferroviario/Mapas_GITs_Ferroviario_JANEIRO2013FINAL.pdf
Airports	http://www.apambiente.pt/_zdata/DAR/Ruido/SituacaoNacional/Mapas_GITs_Aereo/Portal_GITa_rev2.pdf

23.6.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 236 Strategic noise mapping issues - Portugal

R1	R2
Inadequate and overly complicated EC guidance for estimating exposed population	This issue has been partially solved with availability of the new population Census dated 2011
Simple EU-wide methodology is necessary	Not an issue anymore
The need to validate noise levels in the field for one year. Assessments were made over a week or a day and the results were then modelled as long-term assessments	This is still an issue which delays and rises the cost of SNM production, especially if a large number of points is required to validate the SNM.
Making realistic simulations 4 metres above ground	Not an issue anymore
-	The economic and financial crises of the country imposed severe budget reductions which delayed the development of the SNMs.

23.7 Noise action planning

23.7.1 Overview

Table 237 number of NAPs (NAP)

	R1	R2
Agglomerations	0	1 (6)
Major airports	0	2 (2)
Major railways	0	0 (13)
Major roads	1	4 (130)

**Note – in some countries, NAPs may be available in draft and have been submitted to the EC and the EEA but still not formally adopted by the responsible political decision maker. As such, some R2 NAPs may still not be adopted or published in-country.*

Note: in brackets are the numbers of NAP of R2. Example: number of major railways with 30 000 to 60 000 train passages/year.

23.7.2 Methodologies for noise action planning

National guidance is provided on the development of noise reduction plans by municipalities, see:

http://www.apambiente.pt/_zdata/DAR/Ruido/NotasTecnicas_EstudosReferencia/PMRR.pdf

The 2006 SNMs were used to developing NAPs in 2008.

Noise reduction plans have been mandatory for municipalities since 2000 and land use planning has been including SNMs ever since.

23.7.3 Measures

The exceedance of noise limit values was generally used as a priority-setting criterion for the NAP.

NAP noise abatement actions are normally proposed so that all over-exposed dwellings in SNMs are protected by noise reduction measures. In practice there are situations where it is not feasible to reduce noise at all sensitive buildings to stay below the limits and, therefore some cost-benefit analysis has been used in those cases to establish priorities and find reasonable solutions.

Typical proposed measures for road traffic noise have been the construction of noise barriers, change of road surface to more silent pavements, reduction of speed limits and façade insulation reinforcement.

23.7.4 Public consultations

Requirements for public participation are set under Decree-Law 146/2006. The authority responsible for the development and review of plans of action is responsible for carrying out public consultation and deciding on procedures.

Depending on the plan's nature and complexity, the authority may decide upon the length of the consultation period, with the minimum set at 30 days. Consultation opens with a public notice, to include the consultation schedule, sources for relevant documentation and how to participate. The draft plan must be made public together with a summary. Following closure of the consultation period, the responsible authority must review the plan and prepare the final version, taking into account the results of public participation.

23.7.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them. Due to the delays in R2 SNMs and NAPs, no new issues have been yet found.

Table 238 Noise action planning issues - Portugal

R1	R2
Problems setting up mitigation measures where noise comes from different sources (for instance from industrial sites and transports, etc.) and responsibility falls with different authorities	Still remains an issue
The period between SNM and NAP drafting	Still remains an issue
Noise abatement measures were not high priority given the economic crisis, limiting access to funds	Still remains an issue
Lack of coordination between different entities when implementing NAPs: For example, authorities in charge of roads crossing agglomerations fail to cooperate with municipalities which, according to Portuguese Noise Law, and independently from the END, must produce their own noise maps and municipal plans for noise reduction. The lack of cooperation can be explained by delays in the production of noise reduction plans by municipalities as well as lack of willingness amongst all authorities concerned to engage with each other.	Still remains an issue
Lack of clarity on the expected outcome of a NAP: Some stakeholders are of the opinion that a NAP for a motorway, for example, should detail all possible noise reduction measures, such as noise barriers and silent asphalts, to fully comply with noise limits stated in the Noise Law, irrespective of the cost. Concessionaries, on the other hand, propose taking cost into consideration, causing delays in the agreement on the actual content of NAPs.	Still remains an issue
The fact that most municipalities have not yet set their delimitation of mixed and sensitive zones, makes it unclear what noise limits should be applied, also contributing to a delay in the production of NAPs.	Still remains an issue
	The major issue delaying the implementation of the NAPs consists of significant cuts in public and private budgets, especially since the financial crisis in 2011, in the framework of the financial bailout of Portugal.

24. ROMANIA

24.1 National implementing legislation for END

24.1.1 Legal implementation

The END was transposed into Romanian legislation[335] by Government Decision (GD) no. 321/2005 (Official Journal No. 358/27.04.2005)[336]. In addition, some Orders of the Ministry (OM) provide clarification on further technical details related to noise indicators, strategic noise mapping, noise action planning, and the evaluation of SNMs and NAPs, as follows[337]:

- OM MMSC/MS no. 1311/861 of 2013 (Official Journal no. 471/30.07.2013)[338] regarding the analysis of the NAPs;
- OM MMGA/MTCT/MS/MAI no. 678/1344/915/1397 of 2006 (Official Journal no. 730/25.08.2006) [339] regarding the interim methods of calculation of the noise indicators;
- OM MMDD no. 1830/2007 (Official Journal no. 864/18.12.2007)[340] regarding the guidelines for developing, analysing and evaluating the SNM;
- OM MMDP/MSP no. 152/558/1119/532/2008 (Official Journal no. 531/15.07.2008)[341] regarding the noise limit values; and
- OM MT no. 266/2013 (Official Journal no. 198/08.04.2013) [342] regarding responsible units for the Strategic noise mapping.

[335] Available in Romanian on http://www.mmediu.ro/beta/domenii/protectia-atmosferei/zgomot-ambiant/legislatie-zgomot-ambiant-legislatie-nationala/

[336] Amended by the GD no. 674/2007 (Official Journal No. 485/19.07.2007) and by GD no. 1260/2012 (Official Journal no. 15/19.01.2013)

[337] Available in Romanian from http://www.mmediu.ro/beta/wp-content/uploads/2013/08/2013-08-13_Zgomot.pdf

[338] Order of the Ministry of Environment, Waters and Woods and Climate Change and of the Ministry of Health regarding the establishing of the committees for verification of the criteria used in developing and analysis of the action plans, as well for approving the composition, organizational rules and operation thereof

[339] Order of the Ministry of Environment, Waters and Woods and Waters Management, Ministry of Transport, Building and Tourism, Ministry of Public Health, Ministry of Administrative and Internal Affairs for the approval of the Guide regarding the interim methods of calculation of the noise indicators for the noise generated by the activities from industrial activities, road traffic, rail traffic and air noise from airports

[340] Order of the Ministry for approval of the Guide for developing, analysing and evaluating the strategic noise map

[341] Order of the Ministry of Environment, Waters and Woods and Sustainable Development, Ministry of Transport, Ministry of Public Health, Ministry of Internal Affairs and Administrative Reform for the approval of the Guide regarding the adoption of limit values and of the method to apply them when developing action plans for indicators L_{den} and L_{night}, when the noise produced by road traffic on the main roads and inside city agglomerations, rail traffic on the main railways and inside city agglomerations, air traffic at large airports and / or urban airports and for noise generated inside the areas where industrial activity in conducted listed in Annex. 1 to Government Emergency Ordinance no. 152/2005 concerning integrated control and prevention of pollution, approved with amendments by Law no. 84/2006

[342] Order of the Ministry of Transport regarding modification of Art. 1 of the OM no. 1258/2005 for establishing of the responsible units for the noise mapping for railroad, roads, harbours inside city agglomerations and airports, under their administration, for developing the strategic noise maps and for related action plans, in its domain of activity

24.1.2 Scope of END implementation – Rounds 1 & 2

R1[343] of strategic noise mapping and noise action planning in Romania included 9 agglomerations, 5 airports, 3 harbours, approximately 268 km of major roads and 70 km of major railways (2 sections: Bucuresti Nord - Chitila and Saligny Palas and 3 railway stations: Arad, Ploiesti Sud and Simeria Calatori). The introduction of definitive thresholds in R2 led to 10 *additional* agglomerations, 3 Harbours, 3258 km of roads and approximately 51 km of major railway lines (included 1 section Bucuresti Nord - Chitila)[344]. The Ministry of the Environment, Waters and Forests based on the data provided by the Romanian National Railway Company "CFR" has informed the agglomeration authority where the traffic is more than 30000 vehicles per year to make separate SNMs in accordance with Art. 4 alin (2) of GD 321/2005 as amended by GD no. 1260/2012.

Table 239 END coverage – Romania

Round	Agglomerations	Major airports	Major rail (km)	Major roads (km)	Industry source (Harbour)
1*	9	1	68	268	2
2**	19	1	119	3270	3

*Source: *GD 321/2005 amend it by GD no. 674/2007 **GD 321/2005 as amended by GD no. 1260/2012*

24.2 Competent Authorities and designated administrative bodies

Institutional responsibilities for END implementation are clearly defined in GD 321/2005, which was amended by GD 1260/2012. However, in reviewing the division of different administrative responsibilities across different institutions, the Competent Authority stated that it is also necessary to take into consideration all the requirements of GD 321/2005.

The Ministry of the Environment is responsible for reporting data related to SNMs and NAPs to the European Commission/ EEA and are active in the development of legislation on noise. The collection of END data is under the responsibility of the EPA and NEPA. An overview of the division of the different administrative responsibilities in Romania is now provided.

[343] available in Romanian http://www.romanian-ports.ro/legimediu/HG674_2007.pdf

[344] available in Romanian http://www.legex.ro/Hotararea-1260-2012-124698.aspx

Table 240 Administrative Responsibility for the END in Romania

Role	Agglomerations	Roads	Railways	Airports	Industry source (Harbour)
Preparing SNMs	Municipalities	National Company of Motorways and National Roads for motorways international and national roads, County or City Councils for county roads	Romanian National Railway Company and Municipalities for railways inside agglomerations	Company which administrate the main airport or the city airport	Company which administrates the Harbours
Collecting SNMs	Commission of Local Environmental Protection Agencies	Commission of National Environmental Protection Agency* for motorways international and national roads, or Commission of Local Environmental Protection Agencies County Councils for County Roads	Commission of National Environmental Protection Agency* for major railway Bucuresti-Brazi and Commission of Local Environmental Protection Agencies for railways which are inside agglomerations	Commission of National Environmental Protection Agency* for main airport and Commission of Local Environmental Protection Agencies for city airports	Commission of Local Environmental Protection Agencies
Approving SNMs	City Councils	Ministry of Transport for motorways, international and national roads and County Councils for County Roads	Ministry of Transport for major railway Bucuresti-Brazi and City Hall railways inside agglomerations	Ministry of Transport for the one major airport within scope For aircraft noise within agglomeration-s, Henri Coanda and for Aurel Vlaicu City Airport and City Councils or County Councils for city airports.	City Councils for other industry source and Ministry of Transport for Harbours
Preparing NAPs	Municipalities	National Company of Motorways and National Roads for motorways international and national roads, County or City Councils for county roads	Romanian National Railway Company for major railway Bucuresti-Brazi and City Hall for railways inside agglomerations	Company which administrate the main airport or the city airport	Company which administrates the Harbours

Role	Agglomerations	Roads	Railways	Airports	Industry source (Harbour)
Initial approval of the NAPs	City Councils	Ministry of Transport or County or County Councils	Ministry of Transport or County Councils	Ministry of Transport or County Councils	Ministry of Transport for Harbours and City Councils for other Industry source
Collecting NAPs	Commission of Local Environmental Protection Agencies***	Commission of National Environmental Protection Agency** for motorways international and national roads, or Commission of Local Environmental Protection Agencies ***	Commission of National Environmental Protection Agency**	Commission of National Environmental Protection Agency** for main airport and Commission of Local Environmental Protection Agencies*** for city airports	Commission of Local Environmental Protection Agencies***
Collecting NAPs	National Environmental Protection Agency				
European Commission/ EEA reporting	Ministry of Environment, Waters and Woods				

**The Commission is made up of members of: Local Environmental Protection Agencies and Ministry of Environment, Waters and Woods*

***The Commission is made up of members of members of: National Environmental Protection Agencies, Ministry of Environment, Waters and Woods and Health Ministry*

**** The Commission is formed by members of: the Environmental Protection Agencies and Health Local Agency*

24.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

24.3.1 Data collection

Government Decision (GD) no. 321/2005 (Official Journal No. 358/27.04.2005)[345] transposes the END's definitions of agglomerations, major roads, major railways and major airports. The borders of agglomerations are not defined but are usually the administrative borders of cities with more than 100,000 inhabitants. The number of inhabitants for each city is publicly available from the website of the National Institute for Statistics[346]. The agglomerations are identified in Annex 8 of the GD no. 321/2005 with further amendments and additions.

Data to delimit major roads, major railways and major airports are available from the National Company of Motorways and National Roads, National Railway Company "CFR" and Romanian Air Traffic Services Administration (governmental institutions under the Ministry of Transport of Romania) respectively.

24.3.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 241 Designation issues - Romania

R1	R2
Inconsistent data quality used by City Halls	Inconsistent data quality used by City Halls remains a problem and some cities did not provide the data necessary to facilitate strategic noise mapping, especially in respect of GIS data. Also, because in some cases strategic noise mapping began with a delay of between 3 and 4 years, this made the collection of data relevant to designation more difficult. One consequence of this is that the NAPs developed to mitigate noise cannot applied in time, or need to be updated in the next round of action planning.
Airport - definition: Directive 2002/49/EC of "major airport"/ Directive 2002/30/CE "city airport"	This issue has been resolved in GD 321/2005 by designating one major airport and then determining which other airports fall under the requirements to map the effects of aircraft noise within agglomerations. In particular, 4 city airports were designated for R1 and 9 city airports in R2. Also, after the revision of GD 321/2005 in 2016, the results of noise mapping for some city airports (those located near agglomerations and not inside agglomerations) will also be taken into consideration. Currently, these do not contribute to population exposure to noise inside the agglomeration and for this reason do not formally have to be mapped. In future, those located near agglomerations will also be mapped in order to help update the mapping of aircraft noise within agglomerations.
Lack of budget	The lack of specific budget remains a problem for local authorities. As a result, in some cases, this has resulted in a 3 or 4-year delay in developing SNMs and NAPs. The process for budget allocation for strategic noise mapping and noise action planning is too lengthy.
	The process of legal approval takes too much time. The most recent amendment to GD 321/2005 was made in 2013 when the GD 1260/2012 has been published in the Official Journal no. 15/19.01.2013 to define major roads, major railway and major

[345] Amended by the GD no. 674/2007 (Official Journal No. 485/19.07.2007) and by GD no. 1260/2012 (Official Journal no. 15/19.01.2013)

[346] http://www.recensamantromania.ro/rezultate-2/

R1	R2
	airports. One of the source for this delay was the need to wait for the results of the 2011 Population Census to become available (but not the final results, only the interim results was available to use when GD 321/2005 was amended). Based on this the number of towns which have to carry out Strategic noise mapping has been reduced from 24 to 19. Also the final results for 2011 Census data was available in July 2013, and when MEWF amended the data again this year the GD 321/2005, the final results of the 2011 Census will be taken into consideration.

24.4 Noise limits and targets

24.4.1 Objectives and scope

Noise limit values have been set at national level in Romania as follows:

- Day (07.00-19.00), evening (19.00-23.00) and night (23.00-07.00)
- L_{night} and L_{den} are used for the evaluation of Strategic noise mapping results. Table 242 – Noise limit values – Romania

However, according to OM MMDP/MSP no. 152/558/1119/532/2008, these limit values are in fact threshold values. In NAPs, threshold values are used. In this document, a national standard STAS 10009 is mentioned and reference is also made to a Health Ministry Order 119/2014 regarding 55 dB limit values for sanitary protect areas. These limit values are compared with the values of the noise to be measured.

Table 242 Limit values (threshold values) in Romania

L_{den}-dB(A)			L_{night}-dB(A)		
Noise sources	Target values for limit values for 2012	Limit values allowed According to OM MMDP/MSP no. 152/558/1119/532/2008, these limit values are in fact threshold values)	Noise sources	Target values for limit values for 2012	Limit values allowed According to OM MMDP/MSP no. 152/558/1119/532/2008, these limit values are in fact threshold values)
	NOT used as a limit in R2	used as limit in R1 and R2		NOT used as limit in R2	used as a limit in R1 and R2
Roads	65	70	Roads	50	60
Railroad	65	70	Railroad	50	60
Airports	65	70	Airports	65	60
Industrial sites	60	65	Industrial sites	50	55
Harbours (activities for transport on road or railroad inside the Harbour)	65	70	Harbour s (activities for transport on road or railroad inside the Harbour)	50	60
Harbours (industrial activities inside the Harbour)	60	**65**	Harbour s (industrial activities inside the Harbour)	50	**55**

Note – the above values are used as threshold values for the purpose of identifying measures in NAPs.

24.4.2 Enforcement and mitigation measures

In accordance with Annex 5 of the GD 321/2005 with amendments and additions, one of the minimal requirements for a SNM is to represent in a graphical way the areas where the noise level exceeds the limit value. According to Art.1 (c) of the GD 321/2005 and with Art.7 (2) of the OM MMDP/MSP no. 152/558/1119/532/2008 when limit values are exceeded in a certain area, then NAP activities must be taken to reduce noise levels.

24.4.3 Methods for establishing noise limit values

In accordance with OM MMDP/MSP no. 152/558/1119/532/2008 the limit values for L_{den} and L_{night} are computed at the most exposed façade of the buildings.

24.4.4 Implementation issues

In Annex 4 of the recently amended GD 321/2005 additional information is included, such as some guidelines for the harmful evaluation of noise, reflecting the fact that it is mandatory to evaluate noise effects using the dose-effect relationship introduced in Annex 3 of Directive 2002 /49/CE. This must take into account the relationship between noise disturbance and L_{den} (generated by traffic or industrial activities) and sleep disturbance and L_{night} (generated by traffic or industrial activities). If it is necessary, some specific relationships can be analysed regarding: building with special noise isolation, buildings with quiet façades, vulnerable groups, industrial noise with important tonal components, impulsive industrial noise or other cases, climatic regimes or different cultural environments. However, the dose-effect relationship has not been introduced yet. Annex 3 of END has not been modified yet in order to establish the dose-effect relationship.)

Although no issues were raised as a result of END implementation in R1 in the Milieu report, a small number of issues were identified through the field research. Issues raised in R1 and 2, together with actions taken to address them are shown in Table 5 below.

Table 243 Noise limits and targets - Romania

Issue	Action
• There are differences between noise limit values used in mapping and measurements. Some interviewees found the use of a combination of limit values and threshold values confusing but the Romanian CA clarified that these are used for different purposes. The noise limits used for noise mapping are threshold values rather than limit values. For NAPs, threshold values are used to help identify measures to reduce noise. • Noise limit values used in mapping were established through Ministerial Order ("MO") MMDP/MSP no. 152/558/1119/532/2008. The previous limit values were set out in Ministerial Order no. 536/1997, which formerly applied in R1[347]. The new applicable limit values were changed in 2014 to 55 dB in the new Health Ministry Order 119/2014, but this is applicable only for sanitary protected areas. • Noise limit values for new roads, railways, airports, industrial areas	No need to take any action[348].

[347] Within protected territories, according to the 1997 MO, continuous equivalent acoustic level (Leq) measured at 3m from the outside wall of the dwelling and at 1.5m height from the ground, cannot exceed 50 dB(A) during day time, and 40 dB(A) during night time.

[348] The competent authority commented that "the noise limit used in noise mapping are in fact threshold values and in measuring is used limit values and we cannot make a comparison between them".

Issue	Action
and buildings (but not for existing infrastructure). According to the national standard STAS 10009-88 "Acoustics in constructions – Admissible limits of noise level", the admissible limits of external noise levels are based on the technical categorisation of streets (traffic intensity) for roads, and based on an assessment of noise emissions in urban areas from railways, airports and industrial sites. It should be noted that this does not apply to existing infrastructure, where threshold values apply. Rather, these limit values are for new roads, railways, airports, industrial areas and buildings. Not for the existing situation. The issues above were applicable in both R1 and R2.	

24.5 Quiet areas

24.5.1 Overview

The END definitions of "quiet area in an agglomeration" and of a "quiet area in open country" were transposed into national legislation by the GD 321/2005 with amendments and additions in Art.2. In Art. 4 (16) it is specified that local authorities together with Local Environmental Agencies can establish quiet areas inside agglomerations in a city setting after strategic noise mapping has been carried out. The table below summarises the number and size of quiet areas established during R1 and R2.

Table 244 Quiet areas – Romania

	R1	R2
Number	Usually the quiet area are the parks and is not given any data regarding their size. Quiet areas can be defined using the threshold values 55 dB for L_{den} and the minimum size 4.5 ha (but not parks)	Strategic noise mapping and noise action planning is not finished yet for all agglomeration and major roads and major railways. But in R2, parks are again designated as quiet areas. Quiet areas can be defined using the threshold values 55 dB for L_{den} and the minimum size 4.5 ha (but not parks)
Size (km^2)		

Delimitation

The GD 321/2005 with amendments and additions leaves the determination of quiet areas under NAP development to the discretion of individual CAs.

Agglomerations

Within agglomerations, L_{den} was used by all national and local authorities for the establishment of quiet areas. Non-acoustic criteria were also used, for areas which are not parks, such as the "minimum 'area of silence' filter", which specifies that only a 4.5 hectares' territory that falls below a <55 dB noise band may be identified as a quiet area (or area of silence) in accordance with OM MMDP/MSP no. 152/558/1119/532/2008.

Open country

Quiet areas in open country are defined as areas not exposed to noise generated by traffic, industry or other activities. It is not clear yet whether these criteria are sufficient to identify quiet areas in open country in practice.

24.5.2 Implementation issues

Difficulties in designating and delimiting quiet areas were not reported.

24.6 Strategic noise mapping

24.6.1 Overview

An overview of SNMs produced in R1 and R2 is shown below.

Table 245 SNMs – Romania

	R1	R2
Agglomerations	9	19
Major airports	1	1
Major railways*	5 (68 km)	18 (119 km)**
Major roads ***	30 (2412 km)	270 (3,270 Km)

** In respect of major railways, there has been an increase in the volume of mapping in Km.*

*** 1 major railway (51.457 Km) + 17 major railways inside agglomerations (67.826 Km)*

**** For 30 road sections noise mapping was produced of 241.717 Km in R1. In R2, across 270 road sections, noise mapping was carried out for a length of 3270.133 Km.*

24.6.2 Data collection

The data collection approach is based on the tools provided in OM MMGA/MTCT/MS/MAI no. 678/1344/915/1397 of 2006 (Official Journal no. 730/25.08.2006). Strategic noise mapping methodologies are set out in GD 321/2005 with amendments and additions and detailed in OM MMDD no. 1830/2007 - Order of the Ministry, for approval of the Guide for developing, analysing and evaluating the SNM.

Table 246 Strategic noise mapping methods used in R1 and 2 - Romania

Noise source/type	Method
Road	French NMPB Routes-96
Railway	Dutch SRM II - 1996
Aircraft	international ECAC.CEAC Doc. 29
Industrial	ISO 9613-2

Obtaining data for strategic noise mapping is the responsibility of local authorities (i.e. city halls) for agglomerations, CNADNR (Romanian National Company of Motorways and National Roads), the National Railway Company for main railway Bucharest-Brazi, and the company which administrate the airports and harbours for airports and harbours.

The Romanian authorities have data for the geographical position of houses, but not in GIS format (usually on paper maps). The interviewees reported that in R1, a lot of time was required to create the GIS database and to develop the noise mapping model by consultants. Population census data for each agglomeration was provided by the National Institute of Statistics, but no data was available on buildings' population,

which has to be collected by consultants.

Regarding road traffic, some municipalities were able to use data from previous road studies, whereas others did not have any such data and had to initiate data collection in accordance with OM MMGA/MTCT/MS/MAI no. 678/1344/915/1397 of 2006.For IPPC industries, data was provided by local environment agencies and data collection is carried out by consultants in accordance with OM MMGA/MTCT/MS/MAI no. 678/1344/915/1397 of 2006. In R1, collating data from different authorities was a time-consuming process for the Ministry. Many national and local authorities reported problems with accessing certain data types, especially estimating the number of dwellings. However, in R2, the competent authority reported strengthened data availability.

24.6.3 Public accessibility of SNMs

Noise maps, where completed, have been made publicly available for download in Romania. These appear to be accessible to the public and can easily be downloaded. There is clear information available about the contours covered and population exposure data[349].

R1 strategic noise mapping data is available online. NAP summaries for the municipalities R1 have also been made available online. For major airport, R1 and R2 SNMs[350] and the NAPs for R2 are already available online[351]. It should be noted that the SNMs, NAPs and web references provided in footnotes are to documents that are available in **Romanian only**.

Strategic noise mapping data and the NAPs for **agglomerations** above 100,000 inhabitants in R2 are available as follows: Bucuresti (only SNMs) [352], Iasi[353],Cluj-Napoca[354] and Timisoara[355], Craiova [356](SNMs) and [357](NAPs), Galati[358], Brasov [359], Ploiesti Agglomeration (Ploiesti, Blejoi, Brazi and Barcanesti) [360], Pitesti[361] (SNMs) and [362](NAPs), Oradea [363](SNMs in format jpg), [364] (SNMs online) and [365] (NAPs), Targu Mures[366], Sibiu [367](SNMs) and [368](NAPs), Arad [369], Baia Mare [370].

[349] See http://www.bucharestairports.ro/files/pages_files/Harti_Strategice_de_Zgomot_Aeroportuar_AIHCB_2008.pdf

[350] http://www.bucharestairports.ro/cnab/ro/despre-noi/protectia-mediului/harti-strategice-de-zgomot-aeroportuar

[351] http://www.bucharestairports.ro/cnab/ro/despre-noi/protectia-mediului/plan-de-actiune-pentru-reducerea-zgomotului-aeroportuar-ambiental

[352] http://hartiacusticebucuresti.ro/

[353] http://www.primaria-iasi.ro/content.aspx?item=1856

[354] http://www.primariaclujnapoca.ro/informatii-publice/harta-de-zgomot.html

[355] http://www.opiniatimisoarei.ro/wp-content/uploads/2014/06/Planuri_de_actine_2013-harta-zgomot.pdf and the NAP http://www.primariatm.ro/uploads/files/harta_zgomot_2013/raport%20Timisoara.pdf

[356] http://www.primariacraiova.ro/ro/harta-de-zgomot-a-municipiului

[357] http://www.primariacraiova.ro/ro/2014-2/planuri-de-actiune-privind-diminuarea-zgomotului-ambiant-1.html

[358] http://www.primaria.galati.ro/portal/pagini.php?page_id=52

[359] http://www.brasovcity.ro/documente/public/Zgomot/PA%20Brasov%20dezbatere.pdf

[360] http://rasp.ro/index.php/biroul-protectia-mediului/516-harti-de-zgomot

[361] http://www.primariapitesti.ro/portal/arges/pitesti/portal.nsf/AllByUNID/00026DA2?OpenDocument

[362]http://www.primariapitesti.ro/portal/arges/pitesti/stiri.nsf/cffb33e653f116e8c22572a4004bb1c2/d0b7fa7664221365c2257a8300265f8b?OpenDocument

[363] http://www.oradea.ro/subpagina/harta-de-zgomot-a-municipiului-oradea

[364] http://harta.oradea.ro/hartaoradea/#sthash.Q5nGZ2hQ.dpuf

The following cities are still developing SNMs and NAPs: Botosani, Constanta and Bacau[371] (Braila and Buzau made SNMs and NAPs) In terms of the timing, for Botosani, Constanta and Bacau, Romania will report SNMs before September 2016. All agglomeration have produced NAPs with the exception of Bucharest, Botosani, Constanta and Bacau. However, not all of the NAPs have yet been submitted to the EC, the work is "in progress".

Strategic noise maps and population exposure data and the NAPs for **airports** in R1 are available in the SNMs and NAPs of the agglomerations and in R2 the following airports are assessed separately: International Airport Bucuresti Băneasa - Aurel Vlaicu[372], International Airport Iasi [373], International Airport Cluj-Napoca[374], International Airport Craiova, the Strategic noise mapping and the NAPs are available in the Craiova town SNMs and the NAPs, International Airport Sibiu[375], International Airport Transilvania Târgu Mureş[376] (SNMs), the NAPs are not available, International Airport Baia Mare, International Airport „George Enescu" Bacău[377]. SNMs and NAPs were prepared for sections of major roads and for major railways inside and outside of agglomerations.

Major road SNMs and NAPs for R1[378] and for R2[379] are available online.

Also the **major railways** which are inside agglomerations are available for the agglomerations which finished the SNMs and all have been submitted to the EC by the Ministry of Environment.

For R2, the SNMs and NAPs for sections of major roads have been finished by the National Company of Motorways and National Roads for national roads and motorways, and the reports have been sent to the EC (for SNMs) and for NAPs the work is in progress. Was need to correlate to the data from different strategic noise mapping sources in order to finalise these reports.

There have also been delays in the development and submission of SNMs and NAPs for R2, since the sections for major roads are still being developed by the National Company of Motorways and National Roads for national roads and motorways. The most recently available reports (SNMs) for all major roads were sent to the EU in February and March 2016. SNMs and NAPs for major railways are available online for

[365] http://www.oradea.ro/subpagina/plan-de-actiune-pentru-reducerea-zgomotului

[366] http://www.tirgumures.ro/index.php?option=com_content&view=article&id=3233&Itemid=207&lang=ro

[367] http://www.sibiu.ro/ro2/pdf/2014/harta_zgomot_sibiu.pdf

[368] http://www.sibiuairport.ro/uploads/public-information/Proiect%20Plan%20de%20Actiune%20Aeroport%20Sibiu.pdf

[369] http://www.primariaarad.ro/info.php?page=hartizgomot.html&newlang=ron&theme=th1-ron

[370] http://www.baiamare.ro/ro/Administratie/Administratia-Publica-Locala/Structura-administratiei/Serviciul-Dezvoltare-Urbana/Compartiment-Dezvoltare-Durabila/

[371] http://www.primariabuzau.ro/index.php?loc=municipiul_bz&id=366&show=1

[372] http://www.bucharestairports.ro/baneasa/ro/informatii-aeroport/restrictii-de-zgomot/harti-strategice-de-zgomot-2011

[373] http://www.aeroport.ro/index.php/ro/plecari/articol/harta-zgomot.html

[374] http://airportcluj.ro/calitate-si-mediu/harti-strategice-de-zgomot-aeroportuar-1

[375] http://www.sibiuairport.ro/dezbatere-publica.html

[376] http://www.targumuresairport.ro/informatii_tehnice.php

[377] http://www.bacauairport.ro/mediu/

[378] http://www.cestrin.ro:8080/harti_zgomot/Default.html according http://noise.eionet.europa.eu/RO.pdf

[379] http://213.177.10.50:5555/zgomotrutier/harti2007.htm

R1 [380] and for R2[381].

The strategic noise mapping data and the NAPs for Harbours in R2 are available as follows: Harbour Constanta Strategic noise mapping and NAPs are still under development, Harbour Galati[382], Harbour Braila for both SNMs [383] and NAPs [384].

The overall picture in Romania is that some completed NAPs have been submitted to the EC, but not all. All reports regarding SNMs was sent with the exception of Constanta (including for harbour), Bacau and Botosani agglomerations. Data regarding SNMs for the Constanta harbour (which is finalised) cannot be sent to EC until the SNMs for industrial source in Constanta agglomeration is also completed, because the harbour noise is also part of the industrial noise from Constanta agglomeration. In other words, there are knock-on delays from particular SNMs not being finalised on time.

24.6.4 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 247 Strategic noise mapping issues - Romania

R1	R2
Lack of experience	Collection of geospatial data and residential data
Lack of (timely) funding for noise mapping	The default rail and road noise emission data used for Strategic noise mapping has some inaccuracies in the calculation of results, so in some cases SNMs had to be corrected to be more comparable with the results of long-term noise measurements.
	Some SNMs were completed after the deadline or are still in development
	At national level, there is strengthened capacity among consultancies to produce SNMs compared with R1. Also, there remains a lack of local Strategic noise mapping and Noise action planning specialists in some municipalities.
	Not all NAPs which have been completed have yet been reported to the EC. In March 2016 all data regarding SNMs (which have been completed, with the exception of Constanta port) were sent to the EC. Data in respect of the remaining 3 agglomerations (Constanta, Bacau and Botosani) will be sent to the EC before September 2016. The NAPs reports to the EC are in progress (for example the NAPs for Baia Mare and for 3 major roads was loaded to Reportnet but the EC has not been informed yet, and for other NAPs the work is in progress). The reporting process was seen as being quite burdensome but due to the lack of human resources assigned in Romania for this task (only one person works on this task).

24.7 Noise action planning

[380] http://www.cfr.ro/CFR_new/Rom/Acorduri/maps_zgomot2008.htm according http://noise.eionet.europa.eu/RO.pdf

[381] http://www.cfr.ro/index.php/ct-menu-item-117/ct-menu-item-123/29-articles/1794-article-98

[382] http://www.romanian-ports.ro/html/harti_zgomot.html

[383] available in Romanian http://www.romanian-ports.ro/harti_zgomot2013/0_Raport_Braila.pdf

[384] available in Romanian http://romanian-ports.ro/harti_zgomot2013/Planuri%20de%20actiune_Port%20Braila_V2_rev1.pdf

24.7.1 Overview

An overview of the NAPs that were meant to be reported is shown in the following table. It has not however been possible to obtain complete data on the number actually submitted. However, data provided by the EC's DG ENV to the consultants in November 2015 suggests that there are some gaps in NAP submission. For instance, in R1, NAPs have been submitted for all 9 agglomerations but only 5 were submitted using the Reportnet mechanism[385]. (Bucharest, Constanta, Craiova, Galati and Iasi). In R2, NAPs have only been submitted for two agglomerations Oradea and Pitesti, for one major railway and for the major airport, and without inform yet the EC in March 2016 was loaded to Reportnet the NAPs for Baia Mare agglomeration and for 3 major roads, and the work is still in progress.

Table 248 The number of NAPs in Romania that are meant to be submitted

	R1	R2
Agglomerations	9	19
Major airports	1	1
Major railways	5	1
Major roads	30	270

** For the other 17 major railway sections inside agglomerations (67.826 Km), the NAP's will be common with the agglomerations NAPs*

Source: CA website and EEA Reportnet data.

The interview with the CA (Ministry of Environment, Water and Forests) identified that 3 agglomerations have not yet finished developing SNMs, which has had knock-on consequences in terms of delays in the development of NAPs. However, the EC database on NAP submissions suggests that a much greater number of NAPs have not yet been submitted and are subject to delays, but the interview with the CA identified also for one agglomeration (Baia Mare) and 3 major roads have finished the uploading process to Reportnet regarding NAPs. Work is also in progress to upload NAPs for all major roads and major railway and for 13 agglomerations.

24.7.2 Methodologies for noise action planning

No formal common methodology was established at the national level but local environmental protection agencies were provided with an Internal Guide, in accordance with the OM MMDD no. 1830/2007 on reporting data in NAPs to the National Environmental Protection Agency.

[385] In R1, some NAPs were sent without using Reportnet. The Reportnet was used as a mechanism to send reports only after the EC sent an official letter to all MS with the recommendation to use the Reportnet system to send reports to the EC.

24.7.3 Measures

Noise action plans in Romania, especially when limit values were exceeded, were produced using different type of noise reduction measures. These measures were drawn up using noise mapping tools (in particular, through the use of difference maps, and future mapping of the noise situation). The types of measures identified in NAPs in R1 and R2 included: traffic planning, land-use planning, technical measures at noise source, economic measures, insulation, the selection of quieter sources and the reduction of sound transmissions. The two main criteria for selecting measures were: population exposure and the ease of implementation. The costs of implementation is not a commonly used criterion because the municipalities do not normally provide any data regarding which actual measures they want to implement.

24.7.4 Public consultations

As required under the Directive, public consultations were undertaken when drawing up NAPs. Typically, draft NAPs were published on the websites of the administrative bodies responsible for the development of particular NAPs for agglomerations, major roads and major railways thirty days before the public consultation meeting actually took place.

After receiving any proposed modifications and suggestions from the public regarding the draft NAP, the competent authority responsible, typically the local or national public administration responded to these comments and then published the final version. A summary of the results from the public consultation is included as a chapter in the NAP.

The NAP for the city of Bucharest is available on the city's website but has not yet been formally adopted by City Hall. A forum was developed on the website to respond promptly to any questions from the public. It is foreseen that the summaries of the NAPs for other agglomerations will be made publicly available.

24.7.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with new issues raised during R2.

Table 249 – Noise action planning issues – Romania

R1	R2
A lack of experience in noise abatement with few external consultants and experts	A lack of financial and human resources within public administration to implement the END was again noted. A lack of experience in noise abatement with few external consultants and experts.
Delays in the financial approval of funds slowed the overall process	There was insufficient budget to implement Noise action planning tasks in R2 (and a knock-on delay in complying with deadlines).
Delays in the submission of NAPs in R1, but all were subsequently sent.	The lack of local noise action planning specialists was again an issue, especially in smaller municipalities which are new in implementing the END.
	The availability of funding to implement measures identified through noise action planning
	The ability to compel noise source holders to implement reduction measures

	Delays in the submission of some NAPs in R2, as described in detail earlier.

25. SLOVAKIA

25.1 National implementing legislation for END

25.1.1 Legal implementation

The national legislation that transposes the END in Slovakia is comprised of a number of different legal acts, namely:

- National Act 2/2005 Coll. (with amendment in National Act 170/2009 Coll.) on the Assessment and Control of Environment Noise, which sets out the END's basic principles, integrated approach, basic definitions of SNMs and NAPs, and stipulates duties, obligations and fines for natural and legal persons, state bodies and local municipalities
- Government Regulation (GR) No. 44/2005 and GR No.43/2005 (with amendment No. 258/2008 Coll.) on SNMs and NAPs. This describes noise indicators in more details, sets limit for actions values for different sources of noise and elaborates detailed data requirements.
- Ministry of Health Regulation No. 195/2005 of 20th April 2005, which sets out the obligations for other bodies on providing data for noise for mapping.
- Expert Guideline of Public Health Authority of the Slovak Republic No. OŽPaZ/5459/2005 (with amendment No. OHŽP/6112/2006) and No. OHŽP/5828/2007 for put together SNMs and actions plans. [386].

Several END provisions had *not* been transposed during R1, those relating to the night time noise indicator, noise assessment method, strategic noise mapping, NAPs, and informing the public. However, these legal gaps had been addressed by the time of R2 implementation.

Additional Slovakian noise legislation includes:

- Ministry of Health Decree No. 549/2007 Coll., which establishes limit values for noise, infrasound and vibration requirements, and the objectification of noise, infrasound and vibration in the environment
- National Act (NA) 355/2007 Coll., on the protection, support and development of public health (with amendments in NA 204/2014 Coll.; NA 74/2013 Coll.; NA 172/2011 Col.; NA 132/2010 Coll.)

In addition, the Ministry of Health has issued four recommendations setting out guidelines on strategic noise mapping.

25.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Slovakia included one agglomeration, no airports or railways and 522 km of major roads.

The transition to the definitive thresholds of the END in R2 led to one *additional* agglomeration, 1 356 km of major roads as well as 512 km of major railways being covered compared with R1.

[386] Links to relevant legislation may be found at: http://www.hlukovamapa.sk/

Table 250 – END coverage – Slovakia

Round	Agglomerations	Major airports	Major rail	Major roads
1	1[387]	n/a	n/a	522 km
2	2[388]	n/a	512 km	1,878 km

25.2 Competent Authorities and designated administrative bodies

The national CA responsible for END implementation is the Public Health Authority (http://www.uvzsr.sk/en/) of the Slovak Republic, which is an agency under the Ministry of Health. In addition, a number of other bodies have been designated as the responsible authorities for major roads and agglomerations, as summarised below:

Table 251 – END implementation - Slovakia[389]

Role	Agglomerations	Roads	Railways	Airports
Preparing and approving SNMs	Local authorities*	Slovak Road Administration (major roads) National Slovak Motorway Company (major roads)	Railways of the Slovak Republic	
Preparing and approving NAPs	Local authorities*	Slovak Road Administration (major roads) National Slovak Motorway Company (major roads)	Railways of the Slovak Republic	
EC/EEA reporting	Public Health Authority (CA)			
Environmental monitoring				

** Bratislava city Capital and Košice city*

25.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

25.3.1 Data collection

For the purpose of SNM calculation, a 3D model of terrain was implemented by obtaining spatial data from databases. Spatial databases were created based on photogrammetry data. Aerial photos were taken in resolution of 25cm per pixel. Input databases were provided by EUROSENSE Ltd. and Geodis Slovakia. For the data on number of inhabitants in each building, data from the central register of Ministry of Interior were used.

[387] Bratislava

[388] Bratislava, Kosice

[389] As required formally by law (see chapter 1.2). Implementation in practice is carried out by private companies, designated by public tender.

25.3.2 Implementation Issues

The methodology for carrying out the calculations was not available before R1. The interim methods in the END were used as well as methods used in other countries which were validated in separate project. Through the project, a substantial number of measurements and comparative calculations were carried out. A number of significant issues were raised during R1, a summary of which is shown below, together with any new issues raised during R2. The issues identified below have significantly slowed down implementation overall, particularly in R1.

Table 252 – Designation issues - Slovakia

R1	R2
GIS data for railroads and road segments were missing	Resolved
Calculation methodology was not available and validated.	Resolved
Substantial amount of measurements was necessary to acquire emission data from different noise sources (roads, railways and industry.)	Resolved
There were communication problems with some of the responsible authorities (municipalities, operators of industries)	Resolved. Only additional issue in R2 was a lack of funds to carry out the tasks.

25.4 Noise limits and targets

25.4.1 Objectives and Scope

The END does not specify mandatory noise limit values. Legislation that implemented the Directive (see first chapter) defined thresholds for limit values. If these values were exceeded, then this was used as the basis for identifying noise abatement measures for preparing NAPs. The table below shows the LV thresholds for different noise sources according to different type of land use. The exceedance of limits set out in the table is not sanctioned.

Table 253 Action values for different noise sources applied in Slovakia

Noise source	Action values for noise indicators [dB]			
	Exterior*		Exterior with special protection from noise**	
	L_{den}	L_{night}	L_{den}	L_{night}
Road-traffic and tram	65	55	55	40
Rail-traffic	60	50	55	45
Airports	65	55	55	40
Industry	55	40	50	35

**without industrial and transport areas;*

***quiet areas in agglomeration, SPA, curative resort*

Source: Government Decree No. 258/2008 Coll.

The limits for outdoor noise are defined in separate legislation[390]. Exceeding limits stated in the separate legislation leads to sanctions that are imposed according to National Act 355/2007 Coll. Purpose Action values are used in creation of NAPs and for displaying of the conflict plans according to END. The purpose of setting national limit values (LVs) is to help prioritise measures and to help develop NAPs.

The LVs laid down in national legislation are mandatory for all operators of noise sources. Limits are set for the different noise sources and for different types of land usage. Accordingly, sources are divided into four groups (road traffic noise and waterways; noise from rail transport; aircraft noise; noise from other sources). Four types of areas are distinguished by type of land use. The limits are shown in the table below.

Table 254 Noise limits in Slovakia for noise descriptors in exterior

Area category	Description of protected region or outdoor space	Reference time interval	PERMISSIBLE VALUES [a] (dB)				
			TRAFFIC NOISE				Noise from other sources
			Road and water traffic [b] [c]	Railways [c]	Airborne traffic		
			$L_{Aeq,p}$	$L_{Aeq,p}$	$L_{Aeq,p}$	$L_{ASmax,p}$	$L_{Aeq,p}$
I	Territory with special protection against noise, e.g. Spas,[10] spa and medical compounds	day	45	45	50	-	45
		evening	45	45	50	-	45
		night	40	40	40	60	40
II	Space in front of the windows of residential rooms of apartment buildings and houses, the area in front of windows of protected rooms in school buildings, health care facilities and other protected objects, [d] or recreational areas	day	50	50	55	-	50
		evening	50	50	55	-	50
		night	45	45	45	65	45
III	Region as in category II and in the vicinity of [a] motorways, I. Class and II. Class roads, local roads with public transportation, railway lines and airports, [11] town centres	day	60	60	60	-	50
		evening	60	60	60	-	50
		night	50	55	50	75	45
IV	Region without residential land use and without protected outdoor spaces, production zones, industrial parks, factory complexes.	day	70	70	70	-	70
		evening	70	70	70	-	70
		night	70	70	70	95	70

Notes:

a) Permissible values are valid only for dry carriageway surfaces and terrain that is not covered by snow.

b) Road traffic is traffic on all road types including tram traffic.11)

c) Public transportation stops, bus, rail and water traffic and taxi parking designated only for embarking and disembarking are assessed as part of road and water traffic.

[390] Ministry of Health Decree No. 549/2007 Coll.

d) Permissible values in front of facades of non-residential structures are applied during the time of their use, e.g. Schools during education period, etc.

As stated in the first section, limits are to be met by every operator of the above-mentioned noise sources. Compliance with the limits during the operation of existing noise sources is usually checked through on-site measurements. In special cases, this is also done by means of calculations. For monitoring the compliance with the limits, measured or calculated value of a noise descriptor is increased by value of uncertainty and the result must be less than the limit value. When designing new noise sources, calculation is used. When introducing the sound source into operation, a control measurement must be carried out. Compliance with the limits is checked at random times or after complaints from residents.

Noise LVs could thus far not be fully enforced due to the high amount of "old noise loads ", a lack of enforcement capacity and the difficulty in enforcing LVs given the perceived conflict among some stakeholders with economic development priorities. Noise limits are, however, applied when new transport or building projects are approved, to prevent problem situations and when inhabitants raise complaints. .

25.5 Quiet areas

25.5.1 Overview

According to the NR SR Act 2/2005 Coll., for the purposes of processing SHM and AP (SNMs and NAPs) under END, quiet areas are designated for which noise indicators have predetermined action values. The obligation to declare a quiet area in open country (outside agglomerations) is set by the law. The law states that on the territory of an agglomeration, quiet areas are declared by municipalities. In practice, no quiet areas in accordance with the requirements of the Act 2/2005 Coll. have been declared during Rounds 1 or 2.

Quiet areas in open country were delimited on the basis of national legislation on nature protection, whereby "quiet areas in open country" cover selected protected areas, including 9 National Parks, 14 Protected Landscape Areas, 384 Nature Protected Areas and 38 Special Protected Areas under the Birds Directive[391].

A national methodology was established for quiet areas in open country.

No quiet areas were however established in agglomerations.

25.5.2 Implementation Issues

No issues were raised as a result of END implementation in R1 or R2.

[391] Justice and Environment, 2009, "Shadow Report on the Implementation of the END"

25.6 Strategic noise mapping

25.6.1 Overview

An overview of SNMs produced in Rounds 1 and 2 in Slovakia is shown below. SNMs for Slovakia are published at www.hlukovampa.sk and in separate reports for individual adjudicating entities (SSC, NDS, City of Bratislava, ŽSR, RC Bratislava, etc.)

Table 255 Number of SNMs – Slovakia

	R1	R2
Agglomerations	0 (1)	0 (2)*
Major airports	0	0
Major railways*	0	1(1) (512 km)
Major roads ***	2(2)	6(6) (1,878 km)

**Only one finalised SNM for an agglomeration has been finalised to date (Bratislava)*

The purpose of the SNMs is to describe the noise levels in the vicinity of significant sources of noise (traffic, industry) and determine noise exceedance values that would require actions on a prioritised basis.

25.6.2 Data collection

Responsibility for data collection lies with the authority in charge of generating the relevant section of a SNM in order to ensure clarity as to which authorities were responsible for generating (collecting) data, working areas for road traffic have been divided up between the relevant administrative authorities given administrative boundaries which are independent of competence over specific stretches of road.

A consultancy company was contracted to prepare spatial vector databases for SNMs. Professional companies were also contracted to process and prepare SNMs and NAPs in R1. The same approach was adopted in R2. It was noted that the END methodology for the determination of the necessary statistical data (inhabitants, schools, buildings, hospitals, etc.) is not completely uniform, leading to problems in interpreting the data.

Table 256 Strategic noise mapping – data availability and collection methods - Slovakia

R1	R2
Spatial databases obtained from photogrammetry	Still valid
Noise emission data from noise sources obtained by measurements	Still valid
Inhabitant data obtained from Central register of Ministry of Interior	Still valid

25.6.3 Strategic noise mapping methods

Data requirements for strategic noise mapping are included in the Regulation of the Ministry of Health No. 195/2005. The methodology for strategic noise mapping is set out in the Expert Guidelines of the Public Health Authority of the Slovak Republic[392]. The methodology for noise action planning is set out in Expert Guideline No. OHŽP/5828/2007. The calculation methods used for each noise source are:

- Road noise by NMPB 96 (interim method by END with application for SK)
- Railway noise by Shall03 (German methodology with application for SK)
- Aviation noise by ECAC Doc. 29 (interim method by END with application for SK)
- Industrial noise by ISO 9613 (interim method by END with application for SK)

Only the two core END indicators, L_{night} and L_{den} are used. Other guidance used includes the '2007 Good Practice Guide for Strategic noise mapping' and the Production of Associated Data on Noise Exposure', and 'Environmental Noise Data Reporting Mechanism Handbook (2007)'.

25.6.4 Public accessibility of SNMs

SNMs and NAPs for Bratislava agglomeration (both Rounds), some major roads and railways are published at: www.hlukovamapa.sk. SNMs and NAPs finalised in 2015 will be uploaded and made publicly available at a later date in 2016.

25.6.5 Implementation Issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 257 - Strategic noise mapping issues - Slovakia

R1	R2 (New issues and R1 issue remediation actions)
Obtaining data for dwellings, schools, hospitals, inhabitants, and industry noise sources	Financing SNMs in agglomerations
Non-existent data for noise emission	
Creation of SNMs is not harmonised with road traffic monitoring cycles	
Time period for SNMs preparation is too short	
Lack of data comparability mainly due to modification of the way of calculation of number of people exposed (assignment to facades).	The same issue remained a challenge in R2
Deadlines defined in the Directive are different from national usual deadlines for regular traffic density monitoring, which is used for the designation (and, consequently, mapping) of major roads. Currently, designation has to be done before latest results from density monitoring are available.	The same issue remained a challenge in R2

[392] No. OŽPaZ/5459/2005 (with amendment No. OHŽP/6112/2006).

25.7 Noise action planning

25.7.1 Overview

An overview of NAPs is shown in the following table.

Table 258 Number of NAPs – Slovakia[393]

	R1	R2
Agglomerations	0(1)**	0(2)
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	n/a	187(622)***

** In R1, there was only one agglomeration for Bratislava, whilst in R2, an additional agglomeration fell within the scope of the END, Košice*

*** A NAP was prepared for the Bratislava agglomeration, but not published due to funding problems caused by the lack of resources allocated to the municipality by the government.*

**** not all NAPs have been finalised for major roads in R2*

Sources: www.hlukovamaps.sk; Public Health Authority of SK; ZSR; NDS, a.s.; SSC; Regionálne cesty Bratislava; Správa ciest KSK; RC Žilina; Správa ciest BSK; Banskobystrická regionálna správa ciest

25.7.2 Methodologies for noise action planning

A guidance document "Expert Guideline No. OZPaZ/5828/2007" was produced by the Public Health Authority of the Slovak Republic. The aim was to define the principles of NAP preparation and the rules and procedures for information to the public, in accordance with Act. No. 2/2005 Coll.[394] and END.

The 2006 SNMs were used as the basis for the development of the 2008 NAPs. The exceeding of action values was used to establish priorities for NAPs. In addition, the 'noise score index' by W. Probst was applied to establish priorities.

25.7.3 Measures

Examples of noise abatement measures included in NAPs in R1 were traffic planning, technical measures at noise source, land-use planning, insulation, and the reduction of sound transmission, noise barriers, etc. In addition, there were examples of incentive-based measures. In R2, similar measures were adopted.

25.7.4 Public consultations

During R1, a report by the NGO called "Justice and the Environment" indicated there was no public participation due to delays finalising the three NAPs and financial constraints[395]. These allegations are not accurate. The public was informed in R1 regarding major roads, but there was very low interest.

[393] Action Plans: As reported to the EC.

[394] Details of the guidance are provided in: http://www.health.gov.sk/redsys/rsi.nsf/0/3e6b545e2697a78cc1256f970033e1b0/$FILE/vestnik0707.pdf.

[395] Op cit 115

The NAP for the Bratislava agglomeration was not published due to funding problems, hence it was not possible to organise a public consultation. There was consequently no public participation. In R2, public participation has so far not been possible, because most of the NAPs are still under development and are not available in draft form.

25.7.5 Implementation Issues

A number of issues were raised during R1, a summary of which is shown below, together with any subsequent actions taken to address them, and new issues raised during R2.

Table 259 Noise action planning issues - Slovakia

R1	R2 (New issues and R1 issue remediation actions)
Time period for NAP preparation is too short	The same issue remained in R2. There have been delays in action planning again in R2
Lack of (adequate) human and financial resources.	The same issue remained in R2
Actions plan methodology and requirements were not sufficiently defined in the END	

26. SLOVENIA

26.1 National implementing legislation for END

26.1.1 Legal implementation

The END has been transposed into national legislation in Slovenia through the following pieces of legislation:

- Government Regulation (GR) No. 105/2005, with an amendment in 34/2008, 109/2009 and 62/2010 Coll (Ur.l. RS 105/2005 in 34/2008, 109/2009 in 62/2010 on the Assessment of Noise indicators in Environment, which sets out the END's basic principles, integrated approach, basic definitions of SNMs and NAPs, and stipulates duties, obligations and fines for natural and legal persons, state bodies and local municipalities.
- Government Regulation (GR) No. 121/2004 Coll (Ur.l. RS 121/2004) on the Evaluation Environmental Noise.
- National Act No. 105/2008 Coll Rules of the related assessment and operational monitoring of noise sources and conditions for its implementation.

26.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Slovenia included one agglomeration, no airports, some major railways and major roads. The introduction of the definitive END threshold in R2 led to one *additional* agglomeration, and an increase in the volume of mapping to 260 km of major rails and 1,128 km of major are covered in total.

Table 260 END coverage – Slovenia

Round	Agglomerations	Major airports	Major rail	Major roads
1	2[396]	n/a	67 km	462 km
2	2[397]	n/a	260 km	1,128 km

26.2 Competent Authorities and designated administrative bodies

The national CA responsible for END implementation is the Slovenian Environment Agency (http://www.arso.gov.si) which is an agency under the Ministry of the environment and spatial planning of Slovenia. In addition, a number of other bodies have been designated as the responsible authorities for major roads and agglomerations, as summarised below:

Table 261 END implementation - Slovenia

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Ljubljana city Capital Maribor city	Ministry of infrastructure; Slovenian infrastructure Agency		
Approving SNMs				
Preparing NAPs				

[396] Ljubljana, Maribor (out obligations (number of inhabitants < 250.000) Maribor agglomeration)

[397] Ljubljana, Maribor

Role/Activity	Agglomerations	Roads	Railways	Airports
Approving NAPs				
EC/EEA reporting	Ministry of the Environment and Spatial Planning of Slovenia Slovenian Environment Agency			

26.3 Noise limits and targets

26.3.1 Objectives and Scope

The END does not specify mandatory noise limit values (LVs). Legislation to implement the Directive (see introduction to the Slovenian country fiche) defined the limits of action values. If these values were exceeded, then this provided the basis for the identification of noise abatement measures on a prioritised basis through NAPs. The following Table shows action values thresholds for different noise sources according to different types of land use. Exceeding the limits set in the table is not sanctioned.

Table 262 Limit values for different protections area applied in Slovenia

Protection Area from Noise	Limit values for noise indicators [dB] – Road, Rail, Airport			
	$L_{A,day}$	$L_{A,evening}$	$L_{A,night}$	L_{DEN}
IV.	70	65	60	70
III.	65	60	55	65
II.	60	55	50	60
I.	55	50	45	55
Protection Area from Noise	**Limit values for noise indicators [dB] - industry**			
	$L_{A,day}$	$L_{A,evening}$	$L_{A,night}$	L_{DEN}
IV.	73	68	63	73
III.	58	53	48	58
II.	52	47	42	52
I.	47	42	37	47

26.4 Quiet areas

26.4.1 Overview

The decree on limit values for environmental noise indicators (Ur. l. RS, št. 105/2005; 34/08) includes the definition of quiet areas. Furthermore Article 4 defines that quiet area can be defined on whichever second area of noise protection or on its part.

However, no quiet areas have as yet been designated during either Rounds 1 or 2 in Slovenia.

26.4.2 Implementation Issues

No implementation issues were raised as a result of END implementation in either R1 or R2, since there were no designated quiet areas.

26.5 Strategic noise mapping

26.5.1 Overview

An overview of the SNMs produced in Round 1 in Slovenia is shown below. Some SNMs for Slovenia have been published (see www.arso.gov.si). The SNMs for agglomerations have not yet been submitted in respect of R2.

Table 263 Number of SNMs - Slovenia

	Agglomerations	Major airports	Major railways	Major roads
R1	1*	0	1 (67 km)	2 (462 km)
R2	2**	0	2 (260 km)	2 (1,128 km)

*There were less than *250.000 inhabitants in Maribor agglomeration, which only came within scope in R2.*

** *SNMs have only been finalised for R1, and have not yet been submitted for R2.*

The objective of SNMs is to describe the noise levels in the vicinity of significant sources of noise (traffic, industry) and determine noise exceedance values that would require actions on a prioritised basis.

26.5.2 Data collection

Responsibility for data collection is spread across different public authorities responsible for generating different parts of SNMs (e.g. road, railways etc.). In respect of major roads, responsibility for road traffic data has been divided between the relevant administrative authorities given that there are administrative boundaries which relate to specific stretches of road and different competences among different local authorities.

The main data sources were: (i) spatial databases obtained from photogrammetry (ii) noise emission data from noise sources obtained by measurements and (iii) inhabitant population data obtained from central register of the Ministry of Interior. The same data sources were used in Round 2.

A consultancy company was contracted to prepare spatial vector databases for SNMs. Professional companies were also contracted to process and prepare SNMs and NAPs in R1. The same approach was adopted in R2. It was noted that the END methodology for the determination of the necessary statistical data (inhabitants, schools, buildings, hospitals, etc.) is not completely uniform, leading to problems in interpreting the data.

26.5.3 Strategic noise mapping methods

The calculation methods used for each noise source are:

- Road noise by NMPB 96 (interim method by END)
- Railway noise by RM II 96 (interim method by END)
- Aviation noise by ECAC Doc. 29 (interim method by END)
- Industrial noise by ISO 9613 (interim method by END)

Other guidance used included the: '2007 Good Practice Guide for Strategic noise mapping and the Production of Associated Data on Noise Exposure', and 'Environmental Noise Data Reporting Mechanism Handbook (2007)'.

26.5.4 Public accessibility of SNMs

The R1 SNMs for the Ljubljana agglomeration are published at: www.arso.gov.si Separate noise maps were produced for road and rail traffic and also for industrial sources. Due to delays in preparing the R2 SNMs in both Ljubljana and Maribor, these are not yet published or accessible to the public.

26.6 Noise action planning

26.6.1 Overview

The table below provides an overview of the NAPs produced in Slovenia in Round 1 and 2.

Table 264 NAPs – Slovenia

	R1	R2
Agglomerations	0 (1)	0 (2)
Major airports	n/a	n/a
Major railways	n/a	n/a
Major roads	n/a	n/a

The data presented above refers to the numbers of NAPs that were submitted (and in brackets, the numbers of NAPs that were meant to be submitted). In R1, according to data from the ENDRM provided by the EC in November 2015, the R1 NAP for the Ljubljana agglomeration has not been submitted. In R2, no NAPs have been submitted for either the Ljubljana or Maribor agglomerations.

27. SPAIN

27.1 National implementing legislation for END

27.1.1 Legal implementation

In Spain, the Environmental Noise Directive has been transposed at national level through Law 37/2003 [398] (known as the "Noise Law"). This represented the first law on environmental noise to be passed at a national level in Spain, although many regional and municipal ordinances previously existed covering this subject.

The Noise Law is further specified through the following two Royal Decrees:

- Royal Decree (RD) 1513/2005[399]: covering evaluation methods and transposition of END Annexes, including noise indicators, supplementary indicators, and calculation methods;
- RD 1367/2007[400]: covering noise zoning, objectives and noise limits.

Another relevant national legislation (RD 1371/2007[401]) concerns noise in buildings, with the aim to reduce noise exposure in new developments.

Responsible authorities had developed different noise limits in regional legislation prior to RD 1367/2007, but are now moving towards common national limits.

27.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Spain included 19 agglomerations, 10 airport(s), and approximately 8,600 km of major roads and 830 km of railway. The introduction of definitive thresholds in R2 led to 41 *additional* agglomerations being covered, with major railway lines almost doubling to 1,480 km and major roads more than doubling to 19,500 km within END scope.

An overview of END coverage by Round is provided below:

Table 265 END coverage – Spain

Round	Agglomerations	Major airports	Major rail	Major roads
1*	19	10	832 km	8,574 km
2**	60***	12***	1,484 km	19,552 km

*Sources: http://cdr.eionet.europa.eu/es/eu/noise/df1/envtozyza ; http://forum.eionet.europa.eu/etc-sia-consortium/library/noise_database/end_df4_df8_results_2012_150630

**Sources : http://cdr.eionet.europa.eu/es/eu/noise/df8/envvxggng ; http://forum.eionet.europa.eu/etc-sia-consortium/library/noise_database/end_df4_df8_results_2012_150630

[398] http://www.magrama.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/leydelruido_tcm7-1707.pdf

[399] http://www.magrama.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/rd1513_2005evaluacionygestiondelruido_tcm7-1710.pdf

[400] http://www.magrama.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/rd1367_2007zonificacionobjetivosdecalidadyemisionesacusticas_tcm7-1708.pdf

[401] http://www.magrama.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/rd1371_2007cte_dbhr_tcm7-1709.pdf

****Initially 64 agglomerations but some turned out to be below 100.000 inhabitants; also initially 13 airports but it turned out that Lanzarote airport did not reach 50.000 operations, so it was dropped.*

Note: Total km of covered railways and roads as reported to EEA by June 2015 – does not coincide with total km initially communicated to the EC.

SNMs were produced not only in terms of the indicators L_{den} and L_n, but also included L_d and L_e.

Strategic Map Units (SMUs) were defined, for each of which the exposed population was calculated in two stages:

- Basic SNMs, covering the entire SMU length or area, at a scale of 1:25.000;
- Detailed SNMs, covering in more detail urban areas and other noise sensitive areas exposed to noise, at a scale of 1:5,000 or 1:10,000;

27.2 Competent Authorities and designated administrative bodies

27.2.1 Implementation arrangements

The Ministry of Agriculture, Food and Environment (MAGRAMA) is responsible for reporting to the European Commission.

The CAs responsible at national level for implementing the END include MAGRAMA and the Ministry of Development through the following Directorates:

- Directorate General of Roads;
- Directorate General of Railways;
- Directorate General of Civil Aviation.

There are also 15 designated CAs at regional level, typically the Environment Department of each autonomous community government, which are responsible for implementing the END on the infrastructures under their jurisdiction (for example: regional roads) and, in some cases, for some municipalities within the region, together with the municipalities.

Each of the 60 municipalities defined as a large agglomeration is responsible for the implementation of the END in their agglomeration, in some cases jointly with the regional government. Bodies responsible for the designation and delimitation of sites, setting noise limit values and developing NAPs are shown in the table below.

Table 266 Administrative Responsibility for the END in Spain

Role	Agglomerations	Roads	Railways	Airports
Preparing SNMs Approving SNMs	Municipalities Autonomous Communities	Ministry of Development * Autonomous Communities	Ministry of Development * Autonomous Communities	Ministry of Development *
Preparing NAPs Approving NAPs	Municipalities Autonomous Communities	Ministry of Development * Autonomous Communities	Ministry of Development * Autonomous Communities	Ministry of Development *
EC/EEA reporting				

* *DGs within the Ministry of Development for Roads, Trains and Civil Aviation*

27.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

27.3.1 Data collection

For national roads, the Centre for the Study and Experimentation of Public Works (CEDEX) a public entity related to both the Ministry of Development and to the MAGRAMA) has prepared in due course some pilot-projects and guidelines which were of great help to establish a methodology and framework for the consultants and CAs to base their work and requirements. This was very important for Spain in order to be able to accomplish the production of SNMs covering thousands of km of roads, which was far beyond the existing strategic noise mapping capacity in Spain in the beginning of the process.

The CAs in charge of providing data had some difficulties to provide the data on the scope of application of the END, especially in the case of roads, for which many versions of number of km have come up along the process of R1.[402]

For both Rounds, data was more readily available for the identification of major airports, agglomerations and railways, but only for some roads due to the need to compile traffic information for all relevant roads.

Cartographic data was generally available in a suitable form although for roads and rail specific cartography had to be produced by the responsible entity for the SNMs.

For the delimitation of agglomerations, administrative criteria were predominantly used.

27.3.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 267 Designation issues - Spain

R1	R2
Lack of coordination between different responsible authorities, resources and personnel	Improved significantly by means of the organisation of specific events and technical courses on the application of the Directive, the leading role of Cedex with the creation of SICAweb – a Noise Information System and also a result of a normal "learning curve".
Some difficulties related to getting precise and updated data on traffic and population of the agglomerations to confirm inclusion for R1, especially where areas were just above/below the scope thresholds (e.g.: road traffic close to 6 million/year)	These difficulties increased slightly in R2 due to the increased number of cases which caused some inconsistency on number of agglomerations, airports, roads and railways to be mapped. Moreover, the economic crisis in Spain means that traffic has decreased in many locations, leading to further issues around locations dropping out of scope.
Lack of a national vision for developing an NAP that integrates all noise sources	Improved with the establishment of criteria for identification of critical areas and methodologies to prepare NAPs.

[402] http://sicaweb.cedex.es/docs/comunicaciones/2009-10-01/INFORME_cartaA14-7982_ago09_v3.pdf

Another implementation issue relates to the dispersion and variety of regional and local laws and regulations related to noise, from the definition of the reference periods of the day, to the types of zone classifications.

27.4 Noise limits and targets

National limits are set in RD 1367/2007. Some regional governments had previously set different standards and the transposition of the Directive came as an opportunity to bring some harmonization through the various regions. The Ministry has stated that regional governments are to move towards the RD 1367/2007 limits. RD 1367/2007 sets out different national limits values according to land use and other parameters (different surroundings and different noise sensitiveness of the populations; existing and new situations, etc.). The more relevant are shown in the following two tables, from Annex II of the RD.

Table 268 National noise limit values – agglomerations - Spain

Acoustic zone type	dB		
	L_d	L_e	L_n
Predominantly dedicated to sanitary, education or cultural use that will required special protection against noise	60	60	50
Predominantly residential use	65	65	55
Zones for other tertiary use other than that given below	70	70	65
Predominantly dedicated to recreation and spectacles	73	73	63
Predominantly dedicated to industrial use	75	75	65
Zones attached to transport infrastructures and other public infrastructure	Not set	Not set	Not set

Source: RD 1367/2007

Table 269 National noise limit values - internal space of buildings aimed at residential use, health, culture and education - Spain

Building use	Type	dB		
		L_d	L_e	L_n
Residential/Living space	Other areas	45	45	35
	Bedrooms	40	40	30
Hospitals	Waiting rooms and other areas	45	45	35
	Bedrooms	40	40	30
Education or cultural	Classrooms	40	40	40
	Reading rooms	35	35	35

Source: RD 1367/2007

Annex II also contains objectives for vibration for different types of buildings.

Annex III sets out the limits for the particular noise levels transmitted to sensitive receivers from roads, railways and airports in terms of L_d, L_e, and L_n and, for the specific cases of railways and airports, also in terms of L_{Amax} as defined in ISO 1996-1: 2003. It also sets out limits for ports and noisy activities in general, both for outdoor and indoor levels, in terms of the parameters $L_{k,d}$, $L_{k,e}$ and $L_{k,n}$ which are defined in Annex I and which basically are evaluation levels obtained from the L_{Aeq} by adding penalties when the noise exhibits tonal, impulsive or low frequency characteristics.

27.5 Quiet areas

27.5.1 Overview

There are provisions for the designation of quiet areas in Law 37/2003 and RD1513/2005.

The noise limits for quiet areas are set in RD 1367/2007:

Quiet areas in an agglomeration and in open country should keep their sound levels below the levels indicated in the table above subtracted by 5 dB(A), meaning for typically, for an area predominantly dedicated to sanitary, education or cultural use that will required special protection against noise, that noise levels should not exceed 55 dB(A) for L_d and L_e and 45 dB(A) for L_n.

Delimitation of quiet areas is a responsibility of the municipalities, which can either define them in their municipal land use plans or during the preparation of SNMs and NAPs. No special attention has been paid to this subject. In 2010, the use of L_{day} and areas of leisure and parks for public were given as potential criteria for the identification of quiet zones.

27.6 Strategic noise mapping

27.6.1 Overview

An overview of the number of SNMs produced so far in Rounds 1 and 2 is shown below, followed by the total number originally envisaged.

Table 270 SNMs – Spain

	R1	R2
Agglomerations	19 (19)	29 (60)
Major airports	10 (10)	12 (12)
Major railways	25 (36) (832 km)	25 (63) (1,484 km)
Major roads	393 (540) (8,574 km)	328 (830) (19,552 km)

Sources: *http://sicaweb.cedex.es/* *http://cdr.eionet.europa.eu/*

Note: N.º of SNMs of roads and railways are expressed in terms of strategic map units, as was defined in Spain, but may vary according to the source. The MAGRAMA is preparing an updated information on these numbers which will be sent to the EC by end of January 2015.

27.6.2 Data collection

In R1 there were some problems with available data, such as building height, number of inhabitants per building, traffic counts in some agglomerations and, in some cases, the lack of enough detail of cartography around the roads, but in general these were overcome and no other major difficulties arose.

Due to the fact that there was only limited national data on population by dwelling, with information only available on city apartment blocks, estimations were made. In some cases, there were also no data on building heights, requiring experts to go out in the field and measure the houses. Finally, measurements to estimate noise emissions from industrial sites had to be done in the field as well as there were no previous data. The 2007 Good Practice Guide was used.

Most of these problems were already solved during R2, where information sources improved very significantly, especially altimetry, buildings and the availability of ortho-images.

There is national guidance on strategic noise mapping, provided through the SICAweb platform. Other reference documents used include: 2007 Good Practice Guide for Strategic noise mapping and the Production of Associated Data on Noise Exposure Roads. Other sources consulted include IMAGINE and the Environmental Noise Data Reporting Mechanism Handbook (2007).

27.6.3 Strategic noise mapping methods

Methods used for the elaboration of the SNMs coincide with those established as provisional recommended methods, in Annex II of the END. The exception was the Cataluña railway network, where the calculation method NMPB-96 SETRA-CERTU-LCP-CSTB was used. This method is considered equivalent to the provisional recommended method, in Annex II of the END.

27.6.4 Public accessibility of SNMs

According to RD 1513/2005 CEDEX created an information portal (Sistema Básico de Información sobre la Contaminación Acústica - SICA) via which the public have access to the SNMs online and other information, such as Ministry communications with the European Commission, NAPs, legislation, responsible authorities, etc.

SNMs are therefore available to the public at the portal SICAweb (Noise Information System) which is interactive and enables the public to access all relevant information by navigating on the map of Spain and select the airport, agglomeration, road or railway to discharge the corresponding SNMs and summary report.

SICA is the responsibility of the Ministry of the Environment and is managed by the General Directorate of Environmental Quality and Assessment. The information can be accessed at http://sicaweb.cedex.es/

Table 271 Strategic noise mapping locations - Spain

	SNM location
1st Round – SNMs	http://sicaweb.cedex.es/mapas-consulta-fase1.php
2nd Round – SNMs	http://sicaweb.cedex.es/mapas-consulta-fase2.php
Population exposed	http://sicaweb.cedex.es/poblacion-exp.php

27.6.5 Implementation issues

A number of issues were raised during R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 272 Strategic noise mapping issues - Spain

R1	R2
Estimating the number of dwelling, schools and hospitals exposed to specific values of noise indicators and estimating the number of people exposed	Improved, both due to better quality of available data and to the learning curve of the consultants.
Obtaining data on land uses	Improved
Gathering data on exceedance of limit values, and the height of buildings	Partially solved with new guidance to identify critical areas for which an NAP is required. Information on height of buildings has improved in general with better more recent cartographic data available.
Weather conditions might also have affected noise assessments	-

27.7 Noise action planning

27.7.1 Overview

Table 273 NAPs – Spain

	R1	R2
Agglomerations	17	9
Major airports	0	0
Major railways	7	0
Major roads	13	3

27.7.2 Methodologies for noise action planning

The minimum requirements for an NAP are laid down in RD 1513/2005, which replicate those of Annex V of the END.

The main criteria for establishing priorities have been population exposure and exceedance of noise limits. Health assessments have not been used.

There were few guidelines at national level on noise action planning for R1. For R2, more guidelines and literature was available, including a guide on strategic noise mapping published by the Ministry of Development in 2010[403]. This guide refers to three types of noise abatement measures:

- Installation of noise barriers - the viability of such a measure must be studied and if found not viable a complex solution must be envisaged; length and height of barriers need to be specified;
- Action on road surfaces – approximate extension and type of pavement must be specified;
- Complex action – must be justified and a more complex solution defined.

For the definition of areas established for barrier installations, the following criteria have been considered:

- **Exposure levels**. Areas in which the L_{night} exposure values are below 55 dB(A) have been excluded.
- **Affected population**. Generally, the exposed areas with a minimum of 300 affected persons have been included in the proposals. However, a considerable number of areas with a smaller population have been included, due to the singularity of the area, the presence of schools or hospitals or the characteristics of the city centre.
- **Technical viability**. The real possibility of barrier construction is evaluated, having rejected the proposal when there is not enough space or when the receptor is much higher than the road. In the areas determined for the establishment of priority actions, the A and B categories have been defined based on the severity of the impact and the effectiveness of the action.

For actions, only residential buildings, educational buildings and hospitals have been considered.

27.7.3 Measures

Noise abatement measures included in NAPs in Spain in R2 included planning, technical measures at noise source, land-use planning, insulation, regulation, economic measures, reduction of sound transmission, and incentives.

For agglomerations, those measures that have been used the least include economic measures and reduction of sound transmission. For roads, the reduction of sound transmissions was the mitigation measure most commonly used.

Mitigation highlighted as particularly effective includes specific plans when noise pollution exceeds legal levels, since plans do not require statutory consultation, as well as building -related legislation on noise limits for new construction (RD 1371/2007 and 1909/81).

[403] http://webaux.cedex.es/egra/DOCUMENTACION/MER-criterios_elaboracion.pdf

27.7.4 Public consultations

While information on SNMs and NAPs has been made public, public consultation for the NAPs, as specified in article 22 of the Noise Law, due to delays in drawing up the NAPs, not many public consultations have been carried out yet. There have been public consultations for the SNMs though, and the results of these have been taken into account on the preparation of NAPs. However, rarely the public responds to these consultations, and it has been observed that people are in general more concerned and ready to take some actions in the case of noise from leisure activities, especially those at night in residential areas, such as outdoor parties, discotheques and bars, etc.

An exception are airports, where public consultation was in general effective and received relevant feedback from the public. For example, in the case of the airport of Madrid-Barajas, feedback was received in R1 that lead to AENA (public agency from the Ministry of Development responsible for the management of airports and for the implementation of the END) introduce important changes in the initial version of the SNM and NAP.

Suggested measures included:

- Carrying out surveys, and using the information from the SNMs
- Organising workshops and public campaigns
- Setting up committees at town city level
- Making the information available on the web

27.7.5 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2.

Table 274 Noise action planning issues - Spain

R1	R2
Lack of experience in evaluating and managing noise pollution	For R2 there was already more experience and some guidelines available.
Budget and costs implications of noise action planning	Budget limitations due to the financial crisis have delayed the launch of SNMs and NAPs for R2, as well as the implementation of measures from R1 NAPs.
Methodological problems with population data and cartographic information, although the problems were expected to diminish over time	Partially solved with better cartographical data
Noise calculations should be about strategic evaluation and not specific noise studies in specific areas	No an issue any more.
There should be common methods for the evaluation of NAPs	Still valid.
-	The timing set by the Directive for the production of NAPs causes difficulties.

28. SWEDEN

28.1 National implementing legislation for END

28.1.1 Legal implementation

The END is transposed in Sweden through the 2004 Regulation on Environmental noise (*Förordning 2004:675 om omgivningsbuller*[404]). Noise is regulated in an "environmental quality standard" (*miljökvalitetsnorm*) which, together with other environmental quality standards, forms part of the fifth chapter in the Environmental Code. The Environmental Code (*Miljöbalken 1998:808*) incorporates a number of EU directives, including the END, and applies to all noise activities.[405]

The Swedish regulation covers both the levels of noise permitted from different sources as well as the levels of noise to which different places can be exposed. In addition, planning regulations can be applied to aid the control of noise pollution at local level.

Environmental noise pollution is regulated in dwellings including patios and residential areas, and to a certain extent in open-air recreation areas (activities undertaken outdoors can obtain a specific permission that allows for them to exceed the set noise limits). Artillery ranges, industrial and other environmentally hazardous activities or facilities, including wind turbines and motor sport courses, are specifically regulated as well. Boat services and snowmobile traffic is largely unregulated (although there are some restrictions applying to certain areas).

Noise levels are specifically regulated for cars (and other motor driven vehicles), road, railway, and aviation. Relevant legislation and the responsible authorities for each regulation are outlined in the table below.

Table 275 Regulation and the relevant authorities - Sweden

Regulation	Relevant authority
The Environmental Code (*Miljöbalken 1998:808*)	*Swedish EPA* Public Health Agency of Sweden[406] Swedish Transport Administration Swedish Transport Agency National Board of Housing, Building and Planning
Regulation of Traffic Noise in Residential Buildings (*Förordning om trafikbuller vid bostadsbyggnader SFS 2015:216*)	National Board of Housing, Building and Planning
Planning and Building Act (*Plan- och bygglagen, 2010:900*)	National Board of Housing, Building and Planning
Regulation on the rules and procedures for the introduction of noise-related operating restrictions at airports (*Förordning 2004:501 om regler och förfaranden för att av bullerskäl införa driftsrestriktioner vid*	Swedish Transport Administration Swedish Transport Agency

[404] http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Forordning-2004675-om-omgiv_sfs-2004-675/

[405] http://www.naturvardsverket.se/Stod-i-miljoarbetet/Rattsinformation/Direktiv/EU-register---forfattningar-inom-miljobalkens-omrade/

[406] The Public Health Agency of Sweden has taken over the role of the National Board of Health and Welfare

Regulation	Relevant authority
flygplatser) N.B. This regulation will be amended or withdrawn in the near future following updates to EU rules and the introduction of noise-related operating restrictions at EU airports[407]	
Aviation Act (*Luftfartslagen 2010:500*) Civil Aviation Ordinance (*Luftfartsförordningen 2010:770*)	Swedish Transport Agency
The Road Act (*Väglagen, 1971:948*)	Swedish Transport Administration
The Railway Construction Act (*Lagen om byggande av järnväg, 1995:1649*)	Swedish Transport Administration

28.1.2 Scope of END implementation – Rounds 1 & 2

R1 of strategic noise mapping and noise action planning in Sweden included 3 agglomerations, 2 airport(s), and 1,318 km of major roads and 217 km of railway.

The introduction of definitive thresholds in R2 led to the inclusion of an *additional* 10 agglomerations, an additional airport and approximately an *additional* 1,179 km of major railway lines and 2,674 km of major roads.

Table 276 END coverage – Sweden

Round	Agglomerations	Major airports	Major rail	Major roads
1	3	2	217 km	1,318 km
2	13	3	1,318 km	3,992 km

28.2 Competent Authorities

In Sweden, environmental noise policy, including END implementation, is led by the Environmental Protection Agency, the Swedish EPA (*Naturvårdsverket*), which has been formally designated as the CA by the Swedish Government.

In R1, the Swedish EPA used their network for the national coordination of environmental noise in order to guide on the END. At that time, the national coordination of environmental noise consisted of 13 other national agencies and representatives from the three biggest communities in Sweden (Stockholm, Göteborg and Malmö).

Nowadays (R2), the national coordination of environmental noise has been reorganised and consists of a steering group (which comprises the National Board of Housing, Building and Planning (*Boverket*), the Public Health Agency of Sweden (*Folkhälsomyndigheten*), the Swedish Transport Administration (*Trafikverket*), the Swedish Transport Agency (*Transportstyrelsen*)[408], the Swedish EPA (Chair), and a

[407] http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/141821.pdf

[408] The Sweden Transport Agency has taken on a supportive role to the Swedish Transport Administration as the Administration took over responsibility with short notice and with few resources in place. As shown in Table 3, the Agency and Administration share the workload with regards to mapping and the development of action plans.

noise network. The steering group decides on activities to be carried out through a number of working groups.

The noise network includes the agencies that are part of the Steering Group as well as the Swedish Work Environment Authority (Arbetsmiljöverket), the Swedish Energy Agency (Energimyndigheten), the Swedish Armed Forces (Försvarsmakten) and the associated Generalläkaren, the Swedish Agency for Marine and Water Management (Havs- och vattenmyndigheten), the Swedish Consumer Agency (Konsumentverket) the Swedish Maritime Administration (Sjöfartsverket), the Swedish County Administrative Boards (Länsstyrelserna) and the Swedish Association of Local Authorities and Regions (Sveriges kommuner och landsting).

In R1, the EPA chaired meetings (seven times per year), which covered discussions about the implementation of the Directive and national coordination of environmental noise. These meetings largely replaced written guidelines. The exception was the Swedish Road Administration that produced guidelines for mapping noise from roads. This involves coordination regarding major roads through agglomerations, the exchange of traffic data between the transport authorities and the municipalities, and establishing common technical and legal interpretations of the END.

In order to guide and inform about the END in R2, the Swedish EPA formed an END-network together with the Swedish Association of Local Authorities and Regions (Sveriges kommuner och landsting). The END-network consists of the Swedish Transport Administration (Trafikverket) and all the municipalities covered by the requirements of the END. Other interested municipalities are also welcome to participate in the network.

The Swedish EPA reports developments to the Commission on behalf of all municipalities and other agencies involved.

The Swedish EPA is tasked by the government, through the letter of instruction, to coordinate the implementation of the END. However, no financial resources have specifically been allocated to the task.

Table 277 Administrative Responsibility for the END - Sweden

Role	Agglomerations, Roads	Railways	Airports
Producing and approving SNMs and NAPs	The City of Stockholm's Environment and Health Administration The Environmental Administration of Göteborg The City of Malmö's Environment Department The Swedish Road Administration	Swedish Rail Administration	R2: Swedish Transport Administration (NAPs) and Swedish Transport Agency (mapping) R1: Luftfartsstyrelsen (mapping and NAP)
Coordination/European Commission/EEA reporting	Environmental Protection Agency		

28.3 Designation and delimitation of agglomerations, major roads, major railways and major airports

28.3.1 Data collection

The Swedish EPA has overall responsibility for reporting data to the EEA through the Reportnet system within EIONET. Individual municipalities have been responsible for collecting data on agglomerations for both Rounds 1 and 2. Communication between the CAs, except the communication directly with the Swedish EPA, is done mainly through the END-network (see below).

During both Rounds, the authorities involved used different strategic noise mapping methods:

- The Swedish Rail Administration used a range of data tools: GIS based mapping material, cadastral and land registration authority and certain municipalities and the Swedish Railway Administration's own information on rails and railway screens. For railways that are frequented by more than 60,000 trains/year, the Swedish Rail Administration also used L_{eq} 24 hours and L_{max} as supplementary noise indicators.
- In special cases, L_{eq} 24 hours and L_{max} were used at 2 metres height (rather than 4m as stipulated in the END) as supplementary noise indicators since these are the guiding values in Sweden.
- The number of dwellings affected by noise pollution was assessed using Statistics Sweden's (SCB) GIS-based information on population in house property[409], and which was matched with population statistics from SCB. The method is based on the assumption that everyone in a house is unprotected against noise from the façade which is most exposed to noise and this was commented on during the first implementation report. According to the Swedish Rail Administration this method leads to a systematic fault and over-reporting as many apartments, assessed as being exposed to noise pollution, also might have a quiet side.

28.3.2 Implementation issues

Overall, the Swedish authorities did not experience any implementation problems when delimiting and designating sites.

28.4 Noise limits and targets

28.4.1 Objectives and Scope

Sweden does not set limit values for noise, but applies indicative noise values that are set out in Government Bill 1996/97:53 Infrastructure Objectives for Future Transport. In addition, the Government Bill 2000/01:130 includes an environmental quality objective for a "Well developed environment". This quality objective includes a partial target for noise (see the tables below).

The Environmental Code, Miljöbalken (1998:808), applies to all noise activities. The purpose of the Code is to avoid the harmful of effects of noise on human health. Chapter 2 of the Environmental Code contains a number of general rules of consideration that express, for instance, the precautionary principle, and the 'polluter pays' principle, and suitable activities and measures.

[409] Divided in frames of 100 x 100 m

The rules have a preventive effect since they make binding demands on anyone running a business or an operation or taking action to learn about the environmental effects of such activities and express the principle that the risks of environmental impact should be borne by the polluter and not by the environment. Concerning airports and noise from aircrafts, the Swedish Environmental Code (Miljöbalken/) is tougher than the directive and there is a specific environmental court (Miljödomstolen), which sets out the conditions that airport owners must adhere to.

Supervisory and licensing authorities have the power to base their decisions on these general rules of consideration concerning injunctions, bans, permit conditions etc. As a result, the content of these rules becomes much more specific through regulations or decisions in each individual case. In devising noise limit values, Sweden took the WHO methodology into account in R1 and 2.

Table 278 Non-binding target values for noise from residential developments - Sweden

Assessment site	Indicative values for new residential developments or new or significantly altered traffic infrastructure* dB(A)		
	Road-traffic noise*	Rail traffic noise**	Air traffic noise
Equivalent level indoors	30	30	30
Maximum level indoors at night (22:00-06:00)	45	45	45
Equivalent level outdoors (at the façade)	55	60	55
Maximum level in outside spaces of dwellings	70	70	70
New dwellings (SFS 2015:215)[410] Equivalent level outdoors - at the façade – step one	55	55	55
New dwellings (SFS 2015:215)[411] Equivalent level outdoors -at patio/porch	50	50	-
*When applying the indicative values in connection with traffic infrastructure measures, consideration should be given to what is technically possible and economically justifiable. Where the outdoor noise level cannot be reduced to the above levels, the aim should be to ensure that the indoor level is not exceeded.			

[410] Förordning om trafikbuller vid bostadsbyggnader, SFS 2015:216 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20150216.htm

[411] Förordning om trafikbuller vid bostadsbyggnader, SFS 2015:216 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20150216.htm

Table 279 Non-binding target values for noise from industrial sites

Land-use type	Noise limit values[412]			
	Day dB (A)	Evening 18:00-22:00 and Sundays and bank holidays 06:00-18:00	Night dB (A)	Occasional noise during the night 22:00-06:00
Residential and leisure use close to residential areas, schools/colleges and healthcare facilities	50	45	40	55
Area for holiday developments and outdoor activities using the natural environment	40	35	35	50

If these indicative noise limit values are not met, authorities can take action (e.g. through injunctions, bans, permit conditions).

28.4.2 Implementation issues

None reported for Rounds 1 or 2.

28.5 Quiet areas

28.5.1 Overview

There were no formal national guidelines for the delimitation of quiet areas either in R1 or R2. However, in 2002, a Swedish Working Group consisting of competent bodies working on noise drew up a proposal for metrics, indicators and auditing methods for "Acoustic Quality in Natural and Cultural Environments"[413], which provides relevant recommendations. The study remains a Swedish EPA report for reference but has not been transcribed into formal guidance.

For the upcoming Round 3, Sweden will use the EEA's report Good practice guide on quiet areas.

There are areas in western and southern Sweden that have been suggested as – and concluded to be suitable – quiet areas. These areas are:

- Lövhagen
- Ören
- Hundudden
- Lövsta
- Fjättern

[412] According to the Round 1 reporting, when applying the indicative values, consideration should be given to what is technically possible and economically justifiable. Where the outdoor noise level cannot be reduced to the above levels, the aim should be to ensure that the indoor level is not exceeded.

[413] See summary document Good acoustic environment... (2007); http://www.naturvardsverket.se/Nerladdningssida/?fileType=pdf&downloadUrl=/Documents/publikationer/620-5708-1.pdf

Although there are no national noise limit values, these areas have been protected from exploitation. These areas are deemed to be "very quiet areas" in accordance with recommendations in the WHO Guidance (albeit not legally binding) and this has also been provided by the Swedish EPA, which published a report in 2007 outlining a classification system for different areas in Sweden.

Table 280 Quiet areas – Sweden

	R1	R2
Number	0	No quiet areas have been announced however the NAPs for the 13 agglomerations indicate that places to be designated as quiet areas are under development and will be announced shortly.
Size (km^2)	N/A	N/A

28.5.2 Implementation issues

No issues were raised as a result of END implementation in Rounds 1 or 2.

28.6 Strategic noise mapping

28.6.1 Overview

Compared to R1, R2 has produced an *additional* 10 SNMs for agglomerations and one *additional* SNM for airports.

No national guidelines have been laid down for Strategic noise mapping, except for roads. Guidelines for mapping noise from roads were developed by the Swedish Road Administration.

Table 281 SNMs - Sweden

	R1	R2
Agglomerations	3	13 (13)
Major airports	2	3 (3)
Major railways	3	13 (13) (1,318 km)
Major roads	3	13 (13) (3,992 km)

Source: European Commission, Rp DF4 8 2012 ANNEX countries ETCSIA Review130828 with WM. data flow 4_8, due in December 2012

28.6.2 Data collection

In R1, the authorities, depending on their access to data, used different methods for mapping noise. All authorities used L_{den} and L_{night} as noise indicators in the preparation of SNMs. Stockholm also used L_{eq} 24 hours as an indicator. L_{eq} 24 hours and L_{max} were also used as supplementary noise indicators by the Swedish Rail Administration for railways that are frequented by more than 60,000 trains/year. In special cases, L_{eq} 24 hours and L_{max} were used at 2 metres height as supplementary noise indicators since these are the guiding values in Sweden. The City of Stockholm, environment and health administration used L_{day} and $L_{evening}$ at 2 and 4 metres above ground separately.

The same data collection methods were used for R2.

Data collection is coordinated (e.g. providing a forum for discussion) by the Swedish EPA, but actual responsibility lies with the municipalities or transport specific agencies. The 13 municipalities are responsible for their respective agglomeration. Luftfartstyrelsen was the CA for airports during R1. For R2, the Swedish Transport Agency is the CA for airports (Luftfartstyrelsen no longer exists), highways, the provinces for major roads outside agglomerations. The municipalities are responsible for roads inside agglomerations. The Swedish Rail Administration is responsible for railways.

Interview feedbacks suggest that there was an element of duplication involved in areas where the authorities had to collaborate and share data (e.g. data for roads within municipalities could have been more easily obtained by the Transport Agency than by the municipalities).

28.6.3 Public accessibility of SNMs

The result of the strategic noise mapping was published on the websites of the responsible authorities through a portal at the EPA's website.

28.6.4 Implementation issues

Table 282 Strategic noise mapping issues - Sweden

R1	R2
With regards to the development of the SNMs for 2006, one major challenge was data access. E.g. the Swedish Rail Administration had problems accessing population data distributed between buildings and within buildings. The Swedish Rail Administration indicated that the information from the Swedish mapping, cadastral and land registration authority regarding the location of the rails was not always correct. The level of detail in the Swedish Railway Administration's maps varied a lot between different areas. The strategic noise mapping of the Swedish Rail Administration was also delayed because the calculation times of the computers used was several weeks. The City of Malmö, Environment Department, the City of Stockholm, environment and health administration and the Environmental Administration Göteborg had difficulties in estimating the number of individuals exposed to noise.[414] The cities had trouble accessing data regarding estimated numbers of dwellings, schools and hospitals exposed to specific values of noise indicators and estimated numbers of people in an area exposed to noise. The Environmental Administration Göteborg also had issues in accessing data regarding existing noise and exceedance of	The municipalities (in particular the 10 cities not involved in R1) have had trouble accessing data regarding estimated numbers of dwellings, schools and hospitals exposed to specific values of noise indicators and estimated numbers of people in an area exposed to noise.

[414] During Round 1, the City of Stockholm, environment and health administration and the Environmental Administration Göteborg called for guidelines and support from the national administration regarding for data quality.

R1	R2
the noise limit values for the 2006 SNMs.	

28.7 Noise action planning

28.7.1 Overview

For R1, six NAPs were produced (for three agglomerations and three airports).

According to an EPA report (2015) [415], for R2, 11 Swedish municipalities produced NAPs. In total, 14 NAPs have been adopted. The Swedish Transport Administration and two municipalities have been delayed with their NAPs and the SNM of one municipality was so deficient that an NAP has not been produced.

The table below provides an overview of the NAPs produced in Sweden in Round 1 and 2.

Table 283 NAPs – Sweden

	R1	R2
Agglomerations	3	14 (11 agglomerations)
Major airports	3 (3)	3 (3)
Major railways	no data	no data
Major roads	no data	no data

The NAPs developed cover a total population of 3 million people in the 12 municipalities. Of these 3 million inhabitants, more than 20% are exposed to equivalent noise levels exceeding 55 dB(A) at their dwellings. The proportion in these municipalities who are exposed to equivalent noise levels exceeding 65 dB(A) at their dwellings vary from just under 1% to around 5%. The cause of the increased exposure is mainly road traffic, followed by railway traffic. Only in the municipality of Stockholm is air traffic a greater problem with approximately 1.5 % of the population of the municipality exposed to noise levels exceeding 55 dB(A) FBN. No municipality identified high equivalent noise levels (>55 dB(A)) from large industries, ports etc. [416]

With regards to airports, Sweden had already spent a considerable amount of funding on noise abatement before END implementation. Noise measures to reduce pollution around the publicly owned airports in Sweden amounted to SEK 82,8m (EUR 8,87m) in 2007. Measures have particularly focused on Bromma Airport (part of Stockholm).

Specifically pertaining to airport mapping and NAPs, the Environmental Code (Miljöbalken) requires the owners of airports in Sweden to go through an initial process of negotiation which aims to agree on the level of environmental protection from the outset. This process includes agreeing on the levels of environmental noise permitted. However, once an agreement is reached the airport owner is also protected against requirements for additional actions. As a result, the NAPs produced as part of the implementation of the END are more effective in e.g. regulating the planning and

[415] Naturvårdsverket Åtgärdsprogram för att följa miljökvalitetsnormen för buller: Sammanställning av framtagna åtgärdsprogram år 2013 enligt förordning (2004:675) om omgivningsbuller

[416] Naturvårdsverket Åtgärdsprogram för att följa miljökvalitetsnormen för buller: Sammanställning av framtagna åtgärdsprogram år 2013 enligt förordning (2004:675) om omgivningsbuller

building on new infrastructure than regulating existing measures, which have already been negotiated as part of the Environmental Code rules. Despite this duplicative work, the mapping exercise (and subsequent NAPs) are seen as a useful tool in developing consistent data on the number of people exposed to noise across the EU.

Table 284 NAPs

	R1	R2
Agglomerations	3	12**
Major airports	2	3
Major railways	3	12**
Major roads	3	12**

**Note – in some countries, NAPs may be available in draft and have been submitted to the EC and the EEA but still not formally adopted by the responsible political decision maker. As such, some R2 NAPs may still not be adopted or published in-country.*

***Uppsala city is yet to report*

28.7.2 Methodology for §noise action planning

NAPs need to be developed in accordance with the Environmental Code (miljöbalken) and the Ordinance (2004:675) on Environmental Noise (förordning om omgivningsbuller).

In R1, no national guidelines for drawing up NAPs were developed. The City of Malmö and the Environmental Administration Göteborg used the 2006 maps as a basis for developing their 2008 NAPs but the other authorities did not. All authorities but the Swedish Transport Agency, Civil Aviation Department used exceedance of noise limit values as a basis for establishing priorities for the NAPs. Health based assessments were used in establishing the noise limit values, based on the recommendations of the WHO.

Other criteria used in Round 1 when establishing the priorities for the NAPs were the Swedish Environmental Quality Objectives and transport policy goals and that the actions must be cost effective.

For R2, the Swedish EPA continued to lead the work on developing priorities in the NAPs. The 2012 SNMs were used to develop all NAPs.

28.7.3 Measures

For R1, measures included in NAPs covered traffic planning, land-use planning, technical measures at source, economic measures, selection of quieter sources, regulation, reduction of sound transmission, insulations and incentives.

Population exposure and cost of implementation were rated as important criteria in selecting measures in NAPs, followed by compatible with other legislation. In addition, the flexibility of measures was considered very important by the Swedish Road Administration. In general, easy implementation was considered very important by competent bodies for agglomerations.

The EPA's summary of the NAPs[417] for R2 conclude that:

- The municipalities have been working to implement measures to reduce noise before the adoption of the END. Overall, the rate of implementing measures is generally planned to increase in the coming five years.
- The level of funding which is dedicated to noise reduction varies significantly and depends on the source of the noise.
- The majority of the noise limiting measures (approximately 75%), planned for the next five years are of an informative or investigative nature. Around one-fifth of measures are practical or physical measures (*e.g.* façade measures or speed reduction) and about 5% are inspection and/or enforcement actions taken primarily against property owners.
- All NAPs focus on measures to be implemented by municipal committees, administrations, and companies.
- In half of the municipalities, physical measures are planned for about SEK 20 (EUR 2.15) per inhabitant per year in the coming five years. In these municipalities the physical noise limiting measures will lead to a distinctly improved sound environment for every one in 100 inhabitants in the coming five years.
- Half of the municipalities plan to provide subsidies for noise reduction measures directed at those exposed to equivalent levels of 61-65 dB(A) at their dwelling.
- The SNMs and NAPs have contributed to the issue of noise having gained increased actualization and that further measures are being implemented in the larger municipalities to reduce noise exposure.

28.7.4 Public consultations

The Swedish authorities (the Swedish Environmental Protection Agency, the Swedish Rail Administration and the City of Stockholm) experienced difficulties to engage with the public during R1. The Swedish Rail Administration stressed the need for awareness raising and the understanding of noise impacts to increase the engagement from both the decision makers and the public.

No such issues have been reported for R2, although there seems to be an agreement that there is little interest from the general public with regards to noise pollution and impacts.

28.7.5 Implementation issues

R1	R2
The major problem encountered seems to have been the implementation time.	Still an issue for 2 municipalities and 2 airports whose NAPs are incomplete/yet to be reported. Another possible issue concerns the financing of measures. These are outlined by the municipalities and authorities in charge of the NAPs, but need to be approved yearly by the municipality's primary council through the annual budget and are as such not guaranteed for the five years which the NAP covers.
The authorities thought that the time between the SNMs and the NAPs to be	The competent authority did not consider this to be an issue for R2.

[417] Naturvårdsverket Åtgärdsprogram för att följa miljökvalitetsnormen för buller: Sammanställning av framtagna åtgärdsprogram år 2013 enligt förordning (2004:675) om omgivningsbuller

R1	R2
finished (one year) was too short. Most of them therefore did not base their NAPs on their SNMs.	
There were issues around the exposure measurement, which in Sweden is 2m over the ground, whereas in the Directive it is 4m. The directive allows other preliminary calculation methods, but the reporting must be in the 4m scale because it is included in the definition of L_{den}. This led to a duplication of work for those who carry out the noise assessments.	Despite the duplication of work, Sweden has chosen to continue to carry out both calculation methods in R2 as the additional efforts were considered to be worthwhile.

29. UNITED KINGDOM

29.1 National implementing legislation for END

29.1.1 Legal implementation

The UK's decentralised administrative structure has meant the END has been implemented separately in England, Scotland, Wales, Northern Ireland and Gibraltar. This country report therefore covers all of these jurisdictions.

The legislation required to implement END (listed in the table below) supplements a pre-existing and comprehensive suite of domestic legislation and policy that has developed over a period of over forty years and which helps to manage noise, over and above the END and related regulations. Other bodies such as local authorities, transport authorities, the Environment Agency and its counterparts in the devolved administrations also have certain responsibilities for specific noise issues that are conferred by statute.

Table 285 END legal implementation

Countries	Legislation
England	• Environmental Noise (England) Regulations 2006 • Environmental Noise (Identification of Noise Sources) (England) Regulations 2007 • Amendments to the Environmental Noise (England) Regulations 2006 and the Environmental Noise (Identification of Noise Sources) (England) Regulations 2007
Scotland	• Environmental Noise (Scotland) Regulations 2006
Wales	• Environmental Noise (Wales) Regulations 2006 • Environmental Noise (Wales) (Amendment) Regulations 2009
Northern Ireland	• Environmental Noise Regulations (Northern Ireland) 2006
Gibraltar[418]	• The Environmental (Assessment and Management of Noise) Regulations 2006 (Gibraltar Law of 23rd November 2006)

[418] https://www.gibraltar.gov.gi/new/environmental-noise

29.1.2 Scope of END implementation – Rounds 1 & 2

R1 of Strategic noise mapping and Noise action planning in UK included 28 agglomerations, 19 major airports, approximately 17,500 km of major road and approx. 2,000km of major railway. The various threshold definition changes in R2, and other societal changes, resulted in 45 *additional* agglomerations, 5 *fewer* major airports, and an *additional* approx. 20,000 km of major roads and an *additional* approx. 4,000 km of major railways. A breakdown of these figures by country is shown in the table below.

Table 286 END coverage – UK

Country	Round	Agglomerations	Major airports*	Major rail	Major roads
UK	**1**	**28**	**19**	**2,160 km**	**17,252 km**
	2	**73**	**14**	**6,339 km**	**37,200 km**
England	**1**	23	15	2,000 km	13,900** km
	2	65	10	5,200* km	25,400** km
NI[419]	**1**	1	1	0 km	1,582 km[420]
	2	1	1	89 km	4,460 km[421]
Scotland[422]	**1**	2	3	120 km	1,020 km
	2	4	3	900 km	5,800 km
Wales	**1**	2	0	40 km	750 km
	2	3	0	150 km	1,540 km
Gibraltar[423]	**1**	0	0	0 km	No data[424]
	2	0	0	0 km	No data[425]

** Other airports, in addition to major airports, may also be relevant in agglomerations; ** To nearest 100*

29.2 Designation and delimitation of agglomerations, major roads, major railways and major airports

During both R1 and R2, data were available to allow for the designation of major roads, major railways, major airports and agglomerations according to the definitions in the END.

A lack of precision in the END's definition of "agglomeration" has led to slightly different approaches to the designation of agglomerations within the UK. The boundaries of agglomerations in the UK are generally based on land defined as "urban" according to government geographical data used to determine the physical extent of towns and cities. This means that the boundaries do not coincide with the administrative boundaries of the (far larger number of) local authorities responsible for the management of most types of noise in these cities. In addition, the agglomeration boundaries sometimes exclude green spaces on the edges of built up

[419] http://www.doeni.gov.uk/doeni_-_final_roads_noise_action_plan.pdf; http://www.doeni.gov.uk/final_roads_noise_action_plan_round_2.pdf; http://www.doeni.gov.uk/ni_end_r2_rail_rr043i2.pdf

[420] outside the agglomeration

[421] outside agglomeration

[422] http://www.scottishnoisemapping.org/downloads/NAPS/Transportation_NAP_Revised_Dec_2010.pdf

[423] https://www.gibraltar.gov.gi/new/environmental-noise

[424] https://www.gibraltar.gov.gi/new/sites/default/files/Major_Road_Noise_Map_2008.pdf

[425] https://www.gibraltar.gov.gi/new/sites/default/files/Round_2_Level_Map.pdf

areas. Agglomeration boundaries in agglomerations in Wales were originally defined in the same way as the rest of the UK but were extended in R2 to encompass more green spaces so that such spaces could be identified as "quiet areas in agglomerations". This was because legal opinion was that a formally identified quiet area had to be within the agglomeration boundary.

29.2.1 Data collection

The approach to strategic noise mapping was strategic and designed to provide an overall indication of noise exposure rather than a precisely accurate value at a particular location. The implications of this approach had to be considered in the design of the R1 and R2 Noise action planning process.

29.2.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them, and any new issues raised during R2. The issues identified are broadly common across the UK unless otherwise specified. Where a particular issue is specific to a particular part of the UK (e.g. England, Scotland, Wales, etc.), this is highlighted in brackets.

Table 287 Designation issues - UK

R1	R2
Some definitions in the Directive lacked clarity (such as equivalence and agglomerations)	The END definitions and UK interpretations have not changed in R2, with the exception of Wales extending the agglomerations to include more quiet areas.
	A similar policy, the Noise Policy Statement for Northern Ireland was adopted in Northern Ireland in 2014. Wales extended the scope of its R2 NAP to cover locations and noise issues outside the scope of the END.
The method for delimiting agglomerations was unclear	The END definitions and UK interpretations have not changed in R2, with the exception of Wales extending the agglomerations to include more quiet areas.
Need for interpretation of the definition of a major road or railway where adjacent sections fell above and below the threshold.	The END definitions and UK interpretations have not changed in R2. However, some of the source input data definitions have changed as different/updated datasets became available.

The example of "major roads" is provided to illustrate the complexity behind implementing END definitions. In England, Scotland and Wales, the highway authorities for "trunk roads" and "motorways" are Highways England, Transport Scotland and the Welsh Government respectively. For all other roads and public rights of way in England, the highway authority is usually the County Council or Unitary Authority for a particular area. District Councils in England may carry out some of the functions of a highway authority and these functions may be delegated to them by their County Council. In Northern Ireland the Department of Regional Development owns all roads. In Wales and Scotland there is only a single tier of local government. The END definitions of "> 6,000,000 vehicle passages per year" in R1 and "> 3,000,000 vehicle passages per year" in R2 therefore do not necessarily coincide directly with the UK administrative approach to roads management which requires consideration when allocating responsibilities for noise actions planning between the various responsible highway authorities.

The Directive requires Member States to prioritise steps to reduce and mitigate noise. In England, for example, as part of the NAP process in R1, Defra identified "Important Areas" where the top 1% of the worst-affected people were located (according to the results of strategic noise mapping). Within that, a subset of First Priority Locations (FPLs) was identified with the intention that these locations should be prioritised for investigation. A similar process was followed in R2 although FPLs were not separately identified. Wales took a similar approach to England when identifying "priority areas" in R1, but in R2 set a fixed decibel threshold for defining priority areas on roads and railways in terms of L_{den}, corresponding to the top 1% in R1 for non-motorway roads.

In developing this approach, the CAs needed to be mindful of the need for transport authorities and local authorities to respond to locally set budgets and priorities. The NAPs in England therefore provided a noise management framework with regard to road and railway noise, which allowed the relevant authorities to decide about what, if any, detailed action might be taken. Benefit has been seen from the END in that the NAPs have focussed attention on the areas subject to the highest levels of noise and, in some cases, have relieved pressure on Government to act domestically to introduce additional noise controls.

In Scotland, Noise Management Areas have been identified in order to prioritise noise management. Noise Management Areas are a function of noise, population density and annoyance.

29.3 Competent Authorities and designated administrative bodies

29.3.1 Implementation arrangements

Defra is responsible for engaging with the Commission regarding END on behalf of the UK. It is also the main administrative body for the END in England and produces SNMs (except for aircraft) on behalf of the Secretary of State. Responsibility for noise has been devolved and details of the CAs for the different areas of the UK are given in the tables below.

Whilst national government and the devolved administrations play an important role in setting an overall policy and financial framework, many other stakeholders are involved in implementation. For example, in the case of agglomerations, many of the detailed implementation and local expenditure priorities are delegated to the various relevant local transport authorities. In the case of those roads managed by the newly established Highways England (in England), it has delegated authority to resolve competing priorities within an annual budget and may be able to ring fence funding for noise management.

Table 288 Administrative Responsibility for the END - England

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Central Government (Defra), except airports where relevant	Central Government (Defra)	Central Government (Defra)	Airport Operators[426]
Approving SNMs		Secretary of State	Secretary of State	Secretary of State
Preparing NAPs	Central Government (Defra) except airports where	Central Government (Defra)	Central Government (Defra)	Airport Operators

[426] Central Government will map airports designated under section 80 for the purposes of section 78 of the Civil Aviation Act 1982

Role/Activity	Agglomerations	Roads	Railways	Airports
	relevant			
Approving NAPs	Secretary of State	Secretary of State	Secretary of State	Secretary of State
EC/EEA reporting	Central Government (Defra)			

Table 289 Administrative Responsibility for the END - Scotland

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Scottish Ministers			Airport Operators
Approving SNMs	Scottish Ministers			
Preparing NAPs	Scottish Government			Airport Operators
Approving NAPs	Scottish Ministers			
EC/EEA reporting	Scottish Government			

Table 290 Administrative Responsibility for the END – Wales

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	Welsh Government	Welsh Government		Airport Operators[427]
Approving SNMs	Welsh Ministers			
Preparing NAPs	Welsh Government			Airport Operators
Approving NAPs	Welsh Ministers			
EC/EEA reporting	Welsh Government			

** There are no airports in Wales that trigger any of the END thresholds*

Table 291 Administrative Responsibility for the END – Northern Ireland

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	CAs for roads, railways and airports	Department of Regional Development	Rail Operator	Airport Operators*
Approving SNMs	Department of the Environment			
Preparing NAPs	CAs for roads, railways and airports	Department of Regional Development	Rail Operator	Airport Operators*
Approving NAPs	Minister of the Environment			

[427] Central Government will map airports designated under section 80 for the purposes of section 78 of the Civil Aviation Act 1982

Role/Activity	Agglomerations	Roads	Railways	Airports
EC/EEA reporting	Department of the Environment			

For the absence of doubt, it should be noted that whilst NAPs have been prepared and approved/adopted centrally in the UK they will have been subject to an extensive public consultation exercise between these two stages. In addition, in Scotland and Wales and Northern Ireland, multi-agency partnership working was used to develop the NAPs whereas in England the scale of the exercise precluded such an approach.

Table 292 Administrative Responsibility for the END – Gibraltar

Role/Activity	Agglomerations	Roads	Railways	Airports
Preparing SNMs	N/A	Ministry of Environment/Environmental Agency		N/A
Approving SNMs	N/A	Government of Gibraltar		N/A
Preparing NAPs	N/A	Ministry of Environment/Environmental Agency Rail Operator		N/A
Approving NAPs	Government of Gibraltar			
EC/EEA reporting	Government of Gibraltar			

29.4 Noise limits and targets

29.4.1 Objectives and scope

No formal limit values were in force, or under preparation, during Rounds 1 and 2 in the UK. However, the UK does have noise level thresholds in regulations for determining eligibility for façade sound insulation under certain circumstances for road and rail (and guidance for offers of rehousing, and façade sound insulation in the specific case of aircraft noise). These have been taken into account during development of NAPs, and include:

- Noise Insulation Regulations 1975, as amended 1988
- Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (as amended)
- The Future of Air Transport, DfT White Paper of 2003
- The Aviation Policy Framework 2013

Some larger industrial installations have permits which include noise limit values under the IPPC regime. In addition, different parts of the UK also have administration-specific guideline values and noise exposure bands for new development in force and under preparation.

The system of Integrated Pollution Prevention and Control set out in the IPPC Directive (2008/1/EC, now re-cast as IED) applies an integrated environmental approach to the regulation of certain industrial activities. This means that emissions to air, water, land, plus a range of other environmental effects (including vibration and noise), must be considered together. It also means that regulators must set permit conditions so as to achieve a high level of protection for the environment as a whole. These conditions are based on the use of the Best Available Techniques (BAT), which

balances the costs to the operator against the benefits to the environment. IPPC aims to prevent emissions and waste production and where that is not practicable, reduce them to acceptable levels. IPPC also takes the integrated approach beyond the initial task of permitting through to the restoration of sites when industrial activities cease. Hence, there is potential duplication with managing the noise from Industry sources within the END.

A fundamental reform of the land use planning system in England, has been taking place since 2012. This is one of the most important policy tools for managing the acoustic environment. The principles are that local planning authorities should have more flexibility to make decisions based on local requirements, rather than based on prescriptive, potentially limiting central government guidance. Noise level guidelines were contained in previous planning guidance (known as PPG24) but this has now been cancelled. Concise principles for the control of noise were laid out in the National Planning Policy Framework[428] in 2012. These principles are in line with Government policy in the Noise Policy Statement for England[429]. New Planning Practice Guidance on the control and management of noise under the planning system was first published in 2014 and has been further revised since[430]. Planners and developers are alerted to the existence of the END, NAPs and, in particular, Important Areas and advised that, where relevant, these "should be taken into account".

In Wales, by contrast, planning guidance in note TAN11 has been retained and remains in force. The TAN11 guidance includes some noise level guidelines. In England, Local Planning Authorities have powers to adopt noise level guidelines in local development control documents although they are advised not to apply such guidelines in an inflexible manner.

In Scotland revised planning advice has been published specifically to take account of the Directive and the resulting NAPs, noise management and quiet areas.

29.4.2 Non-binding guideline values

There are also non-binding guideline values, and other criteria, in guidance documents and in British Standards documents such as BS8233 (noise control for buildings), BS4142 (industrial and commercial noise) and BS5228 (construction noise). These documents may contain guideline noise levels but they would normally be applied in practice, in a wider social, environmental and economic context in line with Government policy on sustainable development.

29.4.3 Implementation issues

Any non-binding guidelines that may be applied in the UK will usually have taken into account WHO's latest advice on the health effects of noise, as well as the extensive existing suite of UK noise legislation and guidance. It is recognised that WHO guidance provides thresholds at which adverse effects might start to be detected. It is considered that simply to aim to achieve such WHO values would not take account of the wider social, environmental and economic context. The Noise Policy Statement for England recognises that it is not possible to have a single objective noise-based measure that is applicable to all sources of noise in all situations.

[428] https://www.gov.uk/government/publications/national-planning-policy-framework--2

[429] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

[430] http://planningguidance.planningportal.gov.uk/blog/guidance/noise/noise-guidance/

29.5 Quiet areas

29.5.1 Overview

During both R1 and R2, the UK has focused on the identification of quiet areas in agglomerations, as they were considered to provide the greatest direct benefit to society, and are the only types of quiet area required to be protected from increases in noise under Article 8 of the END.

There has been no attempt to identify quiet areas in open country, mainly because there are already several other existing policy mechanisms to designate areas of the countryside both for conservation purposes (e.g. Habitats Directives) and to protect land from incongruous development. In England, the National Planning Policy Framework also provides for local authorities and communities to designate local green spaces, including ones that are valued for their tranquillity, to protect them from development.

In Scotland, the decision was taken in R1 that candidate quiet areas in agglomerations should be defined as areas which are a minimum of 9 hectares and in which at least 75% of the area is subject to noise levels not exceeding 55dB L_{day} from all sources combined. This resulted in a total of 24 Candidate Quiet Areas (CQAs) being identified in R1 NAPs (12 in Edinburgh and 12 in Glasgow). During R2 a Local Authority was able with good and justifiable reasons to request that any area be classified as quiet. NAPs for the second round of mapping were prepared for four agglomerations. These were released for consultation towards the end of 2013 and together list a total of 77 CQAs (6 in Aberdeen, 5 in Dundee, 38 in Edinburgh and 28 in Glasgow). During the implementation of the NAP, it is intended that a review process should be applied to each CQA to determine whether or not it should become a designated QA. This process involves detailed scrutiny that includes site visits and follows an official procedure described in technical guidance[431].

During R1 in Wales a different approach was taken that involved central and local government officials working together in small working groups in each of the two agglomerations. A pragmatic approach was taken that involved using the SNMs to indicate places that may be quiet, supplemented by consideration of other subjective factors relating to a broader concept of tranquillity before making consensus recommendations for candidate quiet areas on which the public were consulted. A total of 29 quiet areas were designated in the 2 agglomerations in Wales[432] in R1. An additional agglomeration (Newport) qualified in R2, and a further 34 quiet areas designated, bringing the total to 63 across 3 agglomerations and 5 local authorities. They receive special protection from increases in noise under national planning policy. On the back of these designations, the Welsh Government has made grants available to local authorities across the whole of Wales each year since 2012 for projects to improve the provision of tranquil urban green spaces regardless of whether they are in an agglomeration, particularly in deprived communities, and is working to further promote tranquillity through the Green Flag Award scheme.

In Northern Ireland, during R1, the Department of the Environment Planning and Environmental Policy Group (2008) suggested that consideration be given to a range of possible means of defining quiet areas within agglomerations. The list of potential quiet areas would then be taken into consideration, given the knowledge of the nature and usage of the locations identified, before being taken to public consultation. A

[431] http://www.scottishnoisemapping.org/downloads/guidance/Technical_Guidance_for_Quiet_Areas.pdf

[432] http://gov.wales/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/1stroundquietareas/?lang=en

coarse assessment of CQAs, within the Belfast Agglomeration was undertaken during R1. Broad locations where the total noise level from all mapped sources was below 55dB L_{den} according to the SNMs were indicated in the R1 Roads NAP. Following the development of noise assessment criteria by the NIENDSG, it is intended that these preliminary CQAs will be further refined and prioritised by DOENI during R2.

An approach has evolved in England across Rounds 1 and 2 that encourages Local Authorities to nominate candidate areas using a semi-formal process that has been integrated with national and local land use planning policies. The R1 agglomerations NAPs outlined a high-level approach for the identification and management of quiet areas and described their anticipated attributes. Since R1, Defra has worked to support the implementation of this policy by commissioning a number of small studies in liaison with various local authorities, including and trials of different locally-led approaches to identifying quiet areas. Defra also commissioned research exploring how the benefits of quiet areas might be monetised. Defra has responded to the findings of these studies in the R2 Agglomeration NAP by providing a structured process and criteria to facilitate the identification and preservation of quiet areas. To avoid duplication with existing national planning policy, END quiet areas in agglomerations must first be designated local green spaces that are particularly valued for their tranquillity. A number of Local Authorities are believed to be making progress in identifying local green spaces and subsequent quiet areas within their districts but as yet Defra has not formally identified any quiet areas in England.

The table below summarises the number and size of identified or designated quiet areas established during Rounds 1 and 2 in the UK. It should be noted that the same R1 quiet areas may have also been identified in R2 NAPs.

Table 293 Quiet areas - UK

	R1		R2	
	Number	Size (km^2)	Number	Size (km^2)
England	0	n/a	0	n/a
Scotland	12*	n/a	77*	n/a
Wales	29	2	63	13
Northern Ireland	0**	n/a	0**	n/a
Gibraltar	n/a****	n/a	n/a****	n/a
Total UK	>41***	n/a	>140***	n/a

** CCQA; ** Areas < 55 dB(A) L_{den} indicated on consolidated R1 map; *** Including CCQA ****There are no agglomerations in Gibraltar*

Delimitation

During R1, a number of different approaches to the identification of quiet areas were used in each country, and these continued to develop and evolve during R2.

Table 294 Quiet area delimitation – UK

Country	Definition
England	A process has been created so that quiet areas in agglomerations can be nominated by local authorities and confirmed by central government in line with land use planning policy
NI	R1 quiet areas derived from SNMs and equate to broad areas below the L_{den} 55dB noise band from all sources combined, further guidance awaited.
Scotland	R1 candidate quiet areas were open spaces to which the public have access which are over 9ha in size, of which 75% falls below 55 dB Lday from all sources combined. Additional candidate quiet areas have been proposed in R2
Wales	A number of quiet areas have been identified by central and local government working groups using SNMs and subjective tranquillity assessments.

Agglomerations

The number of quiet areas (including candidate quiet areas) in the UK has increased from over 41 during R1 to over 140 during R2. The R2 process is continuing. .

Open country

There are no quiet areas in open country in the UK that have been identified or designated under the END (and indeed there is no requirement to do so). However, there are large areas in open country that are already designated both for conservation purposes and to protect them from incongruous development under existing policy mechanisms.

29.5.2 Implementation issues

A number of issues were raised as a result of R1, a summary of which is shown below, together with actions taken to address them - and any new issues raised during R2.

Table 295 – QA designation issues - UK

R1	R2
Definition of quiet areas lacked clarity	Scotland, Wales & NI have designated quiet areas using different approaches. England has developed a procedure to encourage local identification.
Insufficient evidence of benefits of delimiting quiet areas in rural areas from maps and the mapping requirement is not sufficient to allow such identification.	As identification of quiet areas in rural areas is not a requirement of the END, this is not considered an issue.
Conflicts exist between the control of new development and the protection of quiet areas.	These conflicts remain, need for liaison between development control and END procedures.

29.6 Strategic noise mapping

29.6.1 Overview

SNMs were produced in 2006 (R1) and 2012 (R2), and an overview of their number and type is shown below. The total in aggregate is first presented, followed by the number of SNMs disaggregated by country.

Table 296 SNMs - UK

	R1	R2
Agglomerations	**Total - 28** • England: 23 • Wales: 2 • NI:1 • Scotland: 2 • Gibraltar: 0	**Total – 70 (73)** • England: 65 (65) • Wales: 3 (3) • NI 1 (1) • Scotland: 4 (4) • Gibraltar: n/a
Major airports	**Total - 20** • England: 15 • Wales: 0 • NI: 1 • Scotland: 4 • Gibraltar: 0	**Total – 14 (16)** • England: 10 (12) • Wales: n/a • NI: 1 (1) • Scotland: 3 (3)*** • Gibraltar: n/a
Major railways	**Total** - 4 • England: 1 • Wales: 1 • NI: 1 • Scotland: 1#* • Gibraltar: 0	**Total** – **4 (4) (6,339 km)** • England: 1 (1) • Wales: 1 (1) • NI: 1 (1) • Scotland: 1 (1)* • Gibraltar: n/a
Major roads	**Total** - 5 • England: 1 • Wales: 1 • NI: 1 • Scotland 1 #* • Gibraltar: 1	**Total – 4 (5) (37,200 km)** • England: 1 (1) • Wales: 1 (1) • NI: 1 (1) • Scotland 1 (1)* • Gibraltar: 1**

*** For **England**- There is no legal requirement to submit maps to the Commission for agglomerations, just to submit the results from the population exposure assessment which was carried out for all 65 agglomerations. Furthermore, the CA stated that due to the large number of agglomerations for England submitting the maps would have had a significant administrative burden.*

**** For **Scotland**- one airport fell below the END threshold for R2.*

*# For **England**- 5 airports that had been major airports for R1 and the start of R2 fell out of the END threshold for R2 by the time the mapping was done.*

For **Scotland**- only has one online SNM covering all the transportation sources covered by END at http://www.scottishnoisemapping.org/.*

*#** For **Gibraltar**- we don't hold this information.*

The UK authorities completed R2 of strategic noise mapping as required by the END. A particular challenge in England was the far larger number of agglomerations and major roads captured by the definitive thresholds introduced in R2. This resulted in an increase in the extent of mapping calculations required, despite a reduction in the allocated budget.

29.6.2 Data collection

Most topographic data was already available from government agencies and local authorities. Information on noise sources was obtained from asset owners; industrial site information was obtained from national registers and data specific to propagation were captured by survey either directly in the field or remotely using aerial imagery. Data required for the calculations of noise levels were collated in liaison with various organisations including the Department for Transport, Highways Agency, Network Rail and the Environment Agency.

The Defra website indicates that the England SNMs were made using computer modelling techniques, based on information such as traffic flow data, road/rail type, and vehicle type data, with no actual noise measurements made. It further explains that the modelling took account of features that affect the propagation of noise, such as buildings and topology (e.g. earth bunds), and whether the ground is acoustically absorbent (e.g. grass covered) or reflective (e.g. concrete or water). Calculations produced noise level results on a 10m grid at a receptor height of 4m above ground, as required by the END and the Regulations. Strategic noise mapping in Wales, Scotland, Northern Ireland and Gibraltar followed a similar approach.

The R1 process completed in 2007 was the first strategic noise mapping covering all of the larger urban areas. This meant there were few contractors experienced in producing large scale SNMs. Therefore, for the first round of strategic noise mapping in England, Defra divided the agglomerations, major roads, railways, industry and support functions into multiple separate contracts that were awarded to a number of different contractors with varying amounts of expertise.

Defra reviewed options in preparation for the increased coverage of R2 Strategic noise mapping. Relevant capabilities and expertise were still not widespread in the marketplace. Defra made the decision that the Strategic noise mapping work for R2 would be provided using just two contracts, one for data sourcing and management, input data preparation task and exposure assessment, and one for the noise level calculation task.

The contractual arrangement was designed to minimise Defra's project management activities, as well as the overall cost of the process. All noise calculation for England was carried out within a six-month period, significantly quicker than in R1. Using a single data preparation and noise calculation contractor also meant that consistency was obtained across the country. In Scotland all data collection and cleaning was carried out by a single consultancy organisation.

Collecting data so it is real-world relevant can be costly and time-consuming (in particular for the ground model). Some of this data can be reused between rounds, which accounts in part for the efficiency savings made between R1 and R2. However, it is important to note that this data cannot be reused indefinitely as it will gradually become out of date.

29.6.3 Strategic noise mapping methods

The UK does not have a statutory Strategic noise mapping methodology, but national methods exist for the prediction of some of the noise sources and these have been used for Strategic noise mapping (see table below). For road and rail sources these methods were originally designed for other purposes, such as to help determine eligibility for façade sound insulation at high noise levels. There has been no official attempt to validate UK SNMs with measurements due to the strategic nature of the mapping exercise. However, available research indicated that the results obtained were broadly equivalent to the END interim methods.

Strategic noise mapping results were combined with information on population and their location to determine population exposure. The Defra website states that: "Population exposure figures are calculated by firstly statistically assigning census output area data to buildings in the mapped area (rather than precisely determining the number of people living in each building). A count is then made of number of people falling in each noise band calculated. All population exposure figures are rounded to the nearest 100 people, in accordance with the requirements of the END." In Scotland an average of 2.3 people per dwelling was used.

Table 297 Noise prediction methods used in R1 and 2 - UK

Noise source	Method
Road	UK Calculation of Road Traffic Noise + corrections
Railway	UK Calculation of Railway Noise
Aircraft	UK Aircraft Noise Model (CAA – ANCON) The SNMs for some airports were developed using the Report on Standard Method of Computing Noise Contours around Civil Airports (referred to as ECAC Doc. 29 v 3) as implemented in INM v 7
Industrial	Toolkit 10 of the "Good Practice Guide for Strategic noise mapping and the Production of Associated Data on Noise Exposure Version 2[433]

The formal publication (and subsequent transposition) of the Directive that amends Annex II of the END will lead to use of the EU's CNOSSOS common methodology from Round 4. However, none of the five UK countries intend to adopt the CNOSSOS methodology on a voluntary basis for Round 3, other than possibly undertaking some limited trials.

29.6.4 Public accessibility

It is UK government policy that environmental information is made available to the public.

In England, SNMs for major road and major rail sources identified in the first round of Strategic noise mapping are available on the archived Defra website at: http://archive.defra.gov.uk/environment/quality/noise/environment/mapping/index.htm. Interactive maps for first round agglomerations with links to Strategic noise mapping and exposure results are available from http://services.defra.gov.uk/wps/portal/noise, and can be searched by postcode to find SNMs for specific areas for road, rail and industrial sources. In the transition from a Defra website to a government-wide website, some links have been lost and this is being rectified as part of the transition process and will also include the R2 maps. Current SNMs for airports are available from their NAPs which are published on the airports' websites.

The Welsh interactive SNMs may be viewed and searched by postcode at:

http://data.wales.gov.uk/apps/noise

The Scottish interactive SNMs may be viewed and searched by postcode at

http://www.scottishnoisemapping.org/

[433] Position Paper Final Draft (European Commission Working Group Assessment of Exposure to Noise, 13 January 2006) (WG-AEN)

Northern Ireland has online maps along with population exposure tables, available at:

http://www.noiseni.co.uk/index/maps-and-charts.htm

Gibraltar roads SNM can be viewed at:

http://www.environmental-agency.gi/documents/NoiseMap.pdf

29.6.5 Implementation issues

Defra produced a Progress Report[434] in January 2014 on END implementation in England with a focus on implementation of R1 NAPs (NAPs). The issues raised in the report are summarised in the table below.

A paper published in November 2014 at a major international conference, Internoise 2014, mentions some of the organisational and technical implementation issues that arose during R2 Strategic noise mapping in England[435], and concludes that: "A different contractual approach has led to a more cost-effective way of producing the calculated noise values. In addition, the English results may now be more comparable with some other EU country's results, because of the interpretation used on which roads to model within agglomerations. However, direct comparison between R1 and R2 results for England is discouraged because of the different assessment methodologies used. The use of CNOSSOS, if implemented, for Round 3 calculations across the EU will enhance comparability of results between different countries, but will also make comparison back to R1 and 2 results difficult."

Table 298 Strategic noise mapping issues - UK

R1	R2
Lack of a harmonised mapping method	Financial constraints have resulted in a need for a different more cost-effective approach to Strategic noise mapping in R2.
Lack of clarity on reporting requirements prior to the publication of ENDRM in 2007	Different approach taken to modelling roads in agglomerations means that R1 and R2 results are not directly comparable in England
Lack of guidance	Improved railway vehicle movements data that became available and was used in R2 means that R1 and R2 railway results are not directly comparable in either England or Wales
Lack of formal technical specifications	
Problems accessing all data Lack of high-quality data when mapping to a detailed level technical specifications were developed at a mapping project level	
A general lack of data designed specifically for Strategic noise mapping	

[434] Environmental Noise Directive, Implementation of Round 1 Noise Action Plans: Progress Report, January 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276239/noise-action-plan-progress-report-201401.pdf

[435] http://www.acoustics.asn.au/conference_proceedings/INTERNOISE2014/papers/p561.pdf

29.7 Noise action planning

29.7.1 Overview

An overview of the number of NAPs produced during R1 and R2 is shown in the table below. The total in aggregate is first presented, followed by the number of NAPs disaggregated by country.

Table 299 NAPs

	R1	R2
Agglomerations	**Total -** 28 • England:23 • Wales: 2 • NI: ** • Scotland:2 • Gibraltar: 0	**Total – 8 (72)** • England:1 (65) • Wales: 3 (3) • NI: ** • Scotland:4 (4) • Gibraltar: n/a
Major airports	**Total -** 19 • England:15 • Wales: 0 • NI: 1 • Scotland: 3 • Gibraltar: 0	**Total – 14 (16)** • England:10 (12) • Wales: n/a • NI: 1 (1) • Scotland: 3 (3)* • Gibraltar: n/a
Major railways	**Total -**4 • England: 1 • Wales: 1 • NI: 1 • Scotland: 1## • Gibraltar: 0	**Total – 4 (4)** • England: 1 (1) • Wales: 1 ##* (1) • NI: 1 (1) • Scotland: 1 (1) • Gibraltar: n/a
Major roads	**Total -** 5 • England: 1 • Wales: 1 • NI: 1 • Scotland: 1## • Gibraltar: 1	**Total -** 5 • England: 1 (1) • Wales: 1* (1) • NI: 1 (1) • Scotland: 1## (1) • Gibraltar: 1**

Source:Defra and the devolved UK administrations

*Notes: * R1 Agglomerations: NI-Belfast; Scotland - Edinburgh, Glasgow; Wales - Cardiff / Penarth, and Swansea / Neath Port Talbot; England –Birkenhead, Blackpool, Bournemouth, Brighton, Bristol, Coventry, Hull, Leicester, Liverpool, London, Manchester, Nottingham, Portsmouth, Preston, Reading, Sheffield, Southampton, Southend, Teesside, The Potteries, Tyneside, West Midlands, West Yorkshire; **One combined Transportation NAP for major roads and railways in Scotland; ***R2 Agglomerations: NI-Belfast, Scotland – Aberdeen, Dundee, Edinburgh, Glasgow; Wales - Cardiff and Penarth, Newport, and Swansea and Neath Port Talbot; England - One R2 Agglomeration NAP covers all 65 agglomerations – see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276228/noise-action-plan-agglomerations-201401.pdf; #R1 Major Airports: England: Birmingham, Blackpool, Bournemouth, Bristol, East Midlands, Gatwick, Heathrow, Leeds/Bradford, Liverpool, London City, Luton, Manchester, Newcastle, Southampton and Stansted; NI: Belfast International; Scotland: Aberdeen, Edinburgh, Glasgow; #R2 Major Airports: England: Birmingham, Bristol, East Midlands, Gatwick, Heathrow, London City, Luton, Manchester, Newcastle and Stansted; NI: Belfast International; Scotland: Edinburgh, Glasgow*

In practice, NAPs were prepared by Major Airports plus those other airports where their noise emissions contributed to the reported exposure statistics within agglomerations.

29.7.2 Methodologies for noise action planning

During R1, guidelines for drawing up and implementing NAPs were consulted upon and confirmed at a national level (for England, Scotland, Wales and Northern Ireland). The 2006 SNMs were used as a basis for the 2008 NAPs, and to identify areas for prioritisation during Noise action planning. The NAPs were developed following a consultation process involving local authorities, other government departments and other interested bodies and members of the general public. Central and devolved government (or government agencies) took the lead for most of the drafting of R1 NAPs the only exception being airports which were required to draw up, consult upon and implement their own NAPs.

A broadly similar approach was taken to the preparation of the R2 NAPs. A number of efficiency savings were made in the style of the finished documents and the contents drew heavily on the approach taken during R1.

29.7.3 Measures- a case study focusing on England

Across England, Wales, Scotland, NI and Gibraltar, a wide variety of different types of measures that have been identified in NAPs for R1 and R2. However, due to space limitations in this country report, and the fact that the UK is unusual in that there are five different sets of national regulations, the examples of measures focus on selected measures as a case study for England.

At the end of R1, for England, the Defra website had noted that "It is envisaged that NAPs will identify relevant measures (both existing and new) to manage environmental noise from the sources mapped. Such measures could range from over-arching national strategies which take noise into account, to local targeted measures designed primarily to address a specific noise issue. The plans will also include some form of cost-benefit assessment of measures, to ensure their sustainability, and estimates of the reduction of the number of people affected by excessive noise as a result of the proposed measures."

In January 2014, Defra reported[436] on progress in the implementation of R1 NAPs in England as follows:

- **General approach**: In the first instance it was necessary to clarify the main aims of Government policy on noise. This resulted in the publication of the Noise Policy Statement for England (NPSE)[437]. The NAPs were designed to focus on those worst affected and enable local decision makers to address the first aim of the NPSE. In order to facilitate this Defra identified "Important Areas" where the top 1% of the worst affected people were located (according to the results of the Strategic noise mapping). Within that, a subset of First Priority Locations was identified with the intention that these locations should be prioritised for investigation. Defra needed to be mindful of the need for transport authorities and local authorities to respond to locally set budgets and priorities. The NAPs therefore provided a noise management framework with regard to road and railway noise, which allowed the relevant authorities to decide about what, if any, detailed action might be necessary.

[436] Environmental Noise Directive, Implementation of Round 1 Noise Action Plans: Progress Report, January 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276239/noise-action-plan-progress-report-201401.pdf

[437] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

- **Range of outcomes**: For each Important Area, the relevant transport authority was asked to consider the existing noise management and decide what further measures, if any, might be taken to assist the management of noise. A range of possible outcomes were anticipated. These were:

  A: It is possible to be able to implement an action and there are financial resources immediately available to do so.

  B: It is possible to be able to implement an action but there are no immediately available financial resources to do so.

  C: It is not possible to implement any action because there is no scope for doing so or there is some overriding technical issue that prevents implementation.

  D: It is not possible to implement any action because there would be large adverse non-acoustics effects that could not be accommodated by the proposed measure.

  E: Nothing further needs to be done as the noise level at each dwelling in the Important Area is below 65 dB(A), $L_{A10,18h}$, (roads) or 65 dB(A), $L_{Aeq,18h}$, (railways) ignoring the effect of reflection from the facade of the relevant dwelling.

  A/B: Both Outcomes A and B apply

Investigation: A three-stage investigation process was defined:

Stage 1. Identification of an outcome by the relevant transport authority;

Stage 2. Liaison between the transport authority and the relevant local authority about the proposed outcome;

Stage 3. Final decision by the transport authority, taking account of any feedback from the local authority.

Defra also developed an online (restricted access) NAP Support Tool to facilitate information exchange between Defra, the various transport authorities and local authorities.

Progress made was summarised for each noise source:

Roads: For the first round of NAPs, a total of 8,105 Important Areas for roads were identified, comprising 3,487 First Priority Locations and 4,618 other Important Areas. There are just over 150 different highway authorities in England and all except two authorities had at least one Important Area associated with the roads they manage. The Highways Agency had just over 2,400 Important Areas and Transport for London had just under 300. A further eleven highway authorities had over 100 Important Areas each. By 22nd January 2014 291 Important Areas had reached as far as Stage 2 and 2,622 had completed the process and reached Stage 3. This means that investigations have commenced or been completed for just over 35% of the identified Important Areas for roads at that time.

Railways: For the first round of NAPs, a total of 614 Important Areas were identified that comprised 159 First Priority Locations and 455 other Important Areas. The various bodies involved in the management and operation of the railways liaised to implement the NAP. As of 22nd January 2014 12 Important Areas had reached Stage 2 and 559 had reached Stage 3. This means that investigations have commenced or been completed on nearly 93% of the identified Important Areas at that time.

Aviation: Prior to the transposition of the END, most large airports in England were already routinely undertaking their own Strategic noise mapping, and had also implemented a range of local noise management measures specifically tailored to the size and impact of their operations. It was therefore decided that the relevant Airport Operator should be responsible for producing SNMs and for Noise action planning (in consultation with relevant stakeholders). SNMs were produced by all major airports and also those other airports where their noise emissions contributed to the reported exposure statistics within agglomerations. A total of 17 R1 aviation SNMs and NAPs (15 major airports plus 2 others) were reviewed and adopted by the Government. Each airport has a copy of their NAP on their website. As part of the process for reviewing and adopting the airport NAPs, the Government compiled and published a schedule of the noise management actions identified by the various airports.

Industry: Noise from industrial sources is currently managed through three parallel and complimentary regimes:

- development control through land use planning;
- control through European and national industrial pollution control regulations; and
- control through the use of national Statutory Nuisance legislation.

It is considered that above existing noise management regime provides suitable mechanisms for the proactive and reactive management of noise issues from the industrial sources mapped in END agglomerations.

Implementation of NAP (using roads as an example): On December 1st 2014, the government launched its first 'Road Investment Strategy' (RIS)[438]. This sets out an ambitious, long-term programme for motorways and major roads (not necessarily END major roads) with the stable funding needed to plan ahead effectively. The RIS has been summarised in a seven-page leaflet[439]. The RIS includes, amongst other features, a long-term vision for the strategic road network (SRN), outlining how the government plans to create smooth, smart and sustainable roads and a multi-year investment plan that will be used to improve the network and create better roads for users. Over the next 5 years it is stated that this first RIS will see £15.2 billion invested in over 100 major road schemes to enhance, renew and improve the network, help to prevent over 2,500 deaths or serious injuries on the network, build over 1,300 additional lane miles, improve 200 sections of the network for cyclists and "will seek to mitigate 1,150 Noise important Areas reducing the impact of noise for around 250,000 people as well as resurfacing 80% of the SRN using low noise road surfacing".

29.7.4 Public consultations

A public consultation was organised in England by Defra on behalf of UK government on all UK R1 and R2 NAPs in England. Furthermore, transport authorities and operators in most cases held additional public consultations at the local level on specific mitigation measures emerging during the implementation stage. In England, the government response to the full public consultation on the R2 NAPs was published in January 2014:

https://www.gov.uk/government/consultations/draft-noise-action-plans

[438] https://www.gov.uk/government/collections/road-investment-strategy

[439] https://www.gov.uk/government/publications/road-investment-strategy-summary-leaflet

The final R2 NAPs for agglomerations, major roads and major railways in England are available at:

https://www.gov.uk/government/publications/noise-action-plans-large-urban-areas-roads-and-railways

The public consultation was open for 14 weeks. Defra received a total of 23 responses from local authorities, transport authorities, private individuals, and other interested parties to its public consultation on agglomerations, major roads and major railways in England.[440]

Airport NAPs in England are published on the relevant airport website.

Gatwick Airport, for example, summarised the responses to its public consultation which was open for 16 weeks in a document along with its own position as an airport operator in relation to the feedback received.[441]

Details of R2 consultation undertaken in Northern Ireland are no longer available on the government website as the consultation is now more than two years old. The final R2 NAPs for Northern Ireland can be found here:

http://www.doeni.gov.uk/index/protect_the_environment/local_environmental_issues/noise/environmental_noise_directive-2.htm

Details of R2 public consultations undertaken in Scotland can be found here:

http://www.ep-scotland.org.uk/news/draft-noise-action-plan-consultation/

The final R2 NAPs for Scotland are available at:

http://www.scottishnoisemapping.org/public/action-planning.aspx

Details of R2 public consultation undertaken in Wales can be found here:

http://gov.wales/consultations/environmentandcountryside/noise-action-plan-for-wales/?lang=en

The final R2 NAP for Wales (which incorporates the individual END NAPs for major roads, major railways and agglomerations plus additional Wales-wide noise actions) is available at:

http://gov.wales/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/noise-action-plan/?lang=en

The draft R2 NAP for major roads in Gibraltar was made available on the Environmental Agency website for the information of the general public: http://www.environmental-agency.gi

The final R2 NAP for major roads in Gibraltar is available at:

http://www.environmental-agency.gi/NoiseActionPlan.pdf

[440] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276228/noise-action-plan-agglomerations-201401.pdf

[441] Annex 9. https://www.gatwickairport.com/globalassets/publicationfiles/business_and_community/all_public_publications/2010/gatwick_airport_end_noise_action_plan_june_2010.pdf

29.7.5 Implementation issues

A single, albeit important, issue was raised during R1 with respect to implementation, which is repeated below, together with any subsequent actions taken to address it, and new issues raised during R2.

Table 300 Noise action planning issues

R1	R2
Time available between the completion of the mapping and for preparing, consulting upon and adopting NAPs was too short.	The wording of, and the approach to, R2 NAPs is based upon lessons learned during R1. The budget available for preparing NAPs was reduced. In England 23 agglomeration NAPs were produced for R1 whereas 1 NAP was produced to cover all 65 R2 agglomerations to avoid duplication. In Wales a single national NAP was produced to avoid the duplication and incomplete coverage resulting from separate NAPs for major sources and agglomerations. The implementation of R1 and R2 NAPs is a significant task and requires a longer term approach than is acknowledged in the requirements of END. The implementation of R1 and R2 NAPs needs to take account of wider economic, social and other environmental considerations. Funding has recently (Dec 2014) been made available to Highways England that should assist with the implementation of NAPs for major roads in England (see 1.7.3).