

**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**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission <sup>(1)</sup>,

Having regard to the opinion of the Economic and Social Committee <sup>(2)</sup>,

Having regard to the opinion of the Committee of the Regions <sup>(3)</sup>,

Acting in accordance with the procedure laid down in Article 251 of the Treaty <sup>(4)</sup>, and in the light of the joint text approved by the Conciliation Committee on 8 April 2002,

Whereas:

- (1) It is part of Community policy to achieve a high level of health and environmental protection, and one of the objectives to be pursued is protection against noise. In the Green Paper on Future Noise Policy, the Commission addressed noise in the environment as one of the main environmental problems in Europe.
- (2) In its Resolution of 10 June 1997 <sup>(5)</sup> on the Commission Green Paper, the European Parliament expressed its support for that Green Paper, urged that specific measures and initiatives should be laid down in a Directive on the reduction of environmental noise, and noted the lack of reliable, comparable data regarding the situation of the various noise sources.
- (3) A common noise indicator and a common methodology for noise calculation and measurement around airports were identified in the Commission Communication of 1 December 1999 on Air Transport and the Environment. This communication has been taken into account in the provisions of this Directive.
- (4) Certain categories of noise emissions from products are already covered by Community legislation, such as Council Directive 70/157/EEC of 6 February 1970 on

the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles <sup>(6)</sup>, Council Directive 77/311/EEC of 29 March 1977 on the approximation of the laws of the Member States relating to the driver-perceived noise level of wheeled agricultural or forestry tractors <sup>(7)</sup>, Council Directive 80/51/EEC of 20 December 1979 on the limitation of noise emissions from subsonic aircraft <sup>(8)</sup> and its complementary directives, Council Directive 92/61/EEC of 30 June 1992 relating to the type-approval of two or three-wheel motor vehicles <sup>(9)</sup> and Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors <sup>(10)</sup>.

- (5) This Directive should *inter alia* provide a basis for developing and completing the existing set of Community measures concerning noise emitted by the major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery, and for developing additional measures, in the short, medium and long term.
- (6) Certain categories of noise such as noise created inside means of transport and noise from domestic activities should not be subject to this Directive.
- (7) In accordance with the principle of subsidiarity as set out in Article 5 of the Treaty, the Treaty objectives of achieving a high level of protection of the environment and of health will be better reached by complementing the action of the Member States by a Community action achieving a common understanding of the noise problem. Data about environmental noise levels should therefore be collected, collated or reported in accordance with comparable criteria. This implies the use of harmonised indicators and evaluation methods, as well as criteria for the alignment of noise-mapping. Such criteria and methods can best be established by the Community.

<sup>(1)</sup> OJ C 337 E, 28.11.2000, p. 251.

<sup>(2)</sup> OJ C 116, 20.4.2001, p. 48.

<sup>(3)</sup> OJ C 148, 18.5.2001, p. 7.

<sup>(4)</sup> Opinion of the European Parliament of 14 December 2000 (OJ C 232, 17.8.2001, p. 305), Council Common Position of 7 June 2001 (OJ C 297, 23.10.2001, p. 49) and Decision of the European Parliament of 3 October 2001 (OJ C 87 E, 11.4.2002, p. 118). Decision of the European Parliament of 15 May 2002 and Decision of the Council of 21 May 2002.

<sup>(5)</sup> OJ C 200, 30.6.1997, p. 28.

<sup>(6)</sup> OJ L 42, 23.2.1970, p. 16. Directive as last amended by Commission Directive 1999/101/EC (OJ L 334, 28.12.1999, p. 41).

<sup>(7)</sup> OJ L 105, 28.4.1977, p. 1. Directive as last amended by Directive 97/54/EC (OJ L 277, 10.10.1997, p. 24).

<sup>(8)</sup> OJ L 18, 24.1.1980, p. 26. Directive as last amended by Directive 83/206/EEC (OJ L 117, 4.5.1983, p. 15).

<sup>(9)</sup> OJ L 225, 10.8.1992, p. 72. Directive as last amended by Directive 2000/7/EC (OJ L 106, 3.5.2000, p. 1).

<sup>(10)</sup> OJ L 162, 3.7.2000, p. 1.

- (8) It is also necessary to establish common assessment methods for 'environmental noise' and a definition for 'limit values', in terms of harmonised indicators for the determination of noise levels. The concrete figures of any limit values are to be determined by the Member States, taking into account, *inter alia*, the need to apply the principle of prevention in order to preserve quiet areas in agglomerations.
- (9) The selected common noise indicators are  $L_{den}$ , to assess annoyance, and  $L_{night}$ , to assess sleep disturbance. It is also useful to allow Member States to use supplementary indicators in order to monitor or control special noise situations.
- (10) Strategic noise mapping should be imposed in certain areas of interest as it can capture the data needed to provide a representation of the noise levels perceived within that area.
- (11) Action plans should address priorities in those areas of interest and should be drawn up by the competent authorities in consultation with the public.
- (12) In order to have a wide spread of information to the public, the most appropriate information channels should be selected.
- (13) Data collection and the consolidation of suitable Community-wide reports are required as a basis for future Community policy and for further information of the public.
- (14) An evaluation of the implementation of this Directive should be carried out regularly by the Commission.
- (15) The technical provisions governing the assessment methods should be supplemented and adapted as necessary to technical and scientific progress and to progress in European standardisation.
- (16) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission <sup>(1)</sup>,

HAVE ADOPTED THIS DIRECTIVE:

#### Article 1

##### Objectives

1. The aim of this Directive shall be 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. To that end the following actions shall be implemented progressively:

- (a) the determination of exposure to environmental noise, through noise mapping, by methods of assessment common to the Member States;
- (b) ensuring that information on environmental noise and its effects is made available to the public;
- (c) adoption of action plans by the Member States, based upon noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good.

2. This Directive shall also aim at providing a basis for developing Community measures to reduce noise emitted by the major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery. To this end, the Commission shall submit to the European Parliament and the Council, no later than 18 July 2006, appropriate legislative proposals. Those proposals should take into account the results of the report referred to in Article 10(1).

#### Article 2

##### Scope

1. This Directive shall apply to environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas.

2. This Directive shall not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas.

#### Article 3

##### Definitions

For the purposes of this Directive:

- (a) 'environmental noise' shall mean unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity such as those defined in Annex I to Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control <sup>(2)</sup>;
- (b) 'harmful effects' shall mean negative effects on human health;

<sup>(1)</sup> OJ L 184, 17.7.1999, p. 23.

<sup>(2)</sup> OJ L 257, 10.10.1996, p. 26.

- (c) 'annoyance' shall mean the degree of community noise annoyance as determined by means of field surveys;
- (d) 'noise indicator' shall mean a physical scale for the description of environmental noise, which has a relationship with a harmful effect;
- (e) 'assessment' shall mean any method used to calculate, predict, estimate or measure the value of a noise indicator or the related harmful effects;
- (f) ' $L_{den}$ ' (day-evening-night noise indicator) shall mean the noise indicator for overall annoyance, as further defined in Annex I;
- (g) ' $L_{day}$ ' (day-noise indicator) shall mean the noise indicator for annoyance during the day period, as further defined in Annex I;
- (h) ' $L_{evening}$ ' (evening-noise indicator) shall mean the noise indicator for annoyance during the evening period, as further defined in Annex I;
- (i) ' $L_{night}$ ' (night-time noise indicator) shall mean the noise indicator for sleep disturbance, as further defined in Annex I;
- (j) 'dose-effect relation' shall mean the relationship between the value of a noise indicator and a harmful effect;
- (k) 'agglomeration' shall mean part of a territory, delimited by the Member State, having a population in excess of 100 000 persons and a population density such that the Member State considers it to be an urbanised area;
- (l) 'quiet area in an agglomeration' shall mean an area, delimited by the competent authority, for instance which is not exposed to a value of  $L_{den}$  or of another appropriate noise indicator greater than a certain value set by the Member State, from any noise source;
- (m) 'quiet area in open country' shall mean an area, delimited by the competent authority, that is undisturbed by noise from traffic, industry or recreational activities;
- (n) 'major road' shall mean a regional, national or international road, designated by the Member State, which has more than three million vehicle passages a year;
- (o) 'major railway' shall mean a railway, designated by the Member State, which has more than 30 000 train passages per year;
- (p) 'major airport' shall mean a civil airport, designated by the Member State, which has more than 50 000 movements per year (a movement being a take-off or a landing), excluding those purely for training purposes on light aircraft;
- (q) 'noise mapping' shall mean the presentation of data on an existing or predicted noise situation in terms of a noise indicator, indicating breaches of any relevant limit value in force, the number of people affected in a certain area, or the number of dwellings exposed to certain values of a noise indicator in a certain area;
- (r) 'strategic noise map' shall mean a map designed for the global assessment of noise exposure in a given area due to different noise sources or for overall predictions for such an area;
- (s) 'limit value' shall mean a value of  $L_{den}$  or  $L_{night}$ , and where appropriate  $L_{day}$  and  $L_{evening}$ , as determined by the Member State, the exceeding of which causes competent authorities to consider or enforce mitigation measures; limit values may be different for different types of noise (road-, rail-, air-traffic noise, industrial noise, etc.), different surroundings and different noise sensitiveness of the populations; they may also be different for existing situations and for new situations (where there is a change in the situation regarding the noise source or the use of the surrounding);
- (t) 'action plans' shall mean plans designed to manage noise issues and effects, including noise reduction if necessary;
- (u) 'acoustical planning' shall mean controlling future noise by planned measures, such as land-use planning, systems engineering for traffic, traffic planning, abatement by sound-insulation measures and noise control of sources;
- (v) 'the public' shall mean one or more natural or legal persons and, in accordance with national legislation or practice, their associations, organisations or groups.

#### Article 4

#### Implementation and responsibilities

1. Member States shall designate at the appropriate levels the competent authorities and bodies responsible for implementing this Directive, including the authorities responsible for:

- making and, where relevant, approving noise maps and action plans for agglomerations, major roads, major railways and major airports;
- collecting noise maps and action plans.

2. The Member States shall make the information referred to in paragraph 1 available to the Commission and to the public no later than 18 July 2005.

#### Article 5

#### Noise indicators and their application

1. Member States shall apply the noise indicators  $L_{den}$  and  $L_{night}$  as referred to in Annex I for the preparation and revision of strategic noise mapping in accordance with Article 7.

Until the use of common assessment methods for the determination of  $L_{den}$  and  $L_{night}$  is made obligatory, existing national noise indicators and related data may be used by Member States for this purpose and should be converted into the indicators mentioned above. These data must not be more than three years old.

2. Member States may use supplementary noise indicators for special cases such as those listed in Annex I(3).

3. For acoustical planning and noise zoning, Member States may use other noise indicators than  $L_{den}$  and  $L_{night}$ .

4. No later than 18 July 2005, Member States shall communicate information to the Commission on any relevant limit values in force within their territories or under preparation, expressed in terms of  $L_{den}$  and  $L_{night}$  and where appropriate,  $L_{day}$  and  $L_{evening}$ , for road-traffic noise, rail-traffic noise, aircraft noise around airports and noise on industrial activity sites, together with explanations about the implementation of the limit values.

#### Article 6

##### Assessment methods

1. The values of  $L_{den}$  and  $L_{night}$  shall be determined by means of the assessment methods defined in Annex II.

2. Common assessment methods for the determination of  $L_{den}$  and  $L_{night}$  shall be established by the Commission in accordance with the procedure laid down in Article 13(2) through a revision of Annex II. Until these methods are adopted, Member States may use assessment methods adapted in accordance with Annex II and based upon the methods laid down in their own legislation. In such case, they must demonstrate that those methods give equivalent results to the results obtained with the methods set out in paragraph 2.2 of Annex II.

3. Harmful effects may be assessed by means of the dose-effect relations referred to in Annex III.

#### Article 7

##### Strategic noise mapping

1. Member States shall ensure that no later than 30 June 2007 strategic noise maps showing the situation in the preceding calendar year have been made and, where relevant, approved by the competent authorities, for all agglomerations with more than 250 000 inhabitants and for all major roads which have more than six million vehicle passages a year, major railways which have more than 60 000 train passages per year and major airports within their territories.

No later than 30 June 2005, and thereafter every five years, Member States shall inform the Commission of the major roads which have more than six million vehicle passages a year, major railways which have more than 60 000 train passages per year, major airports and the agglomerations with more than 250 000 inhabitants within their territories.

2. Member States shall adopt the measures necessary to ensure that no later than 30 June 2012, and thereafter every five years, strategic noise maps showing the situation in the preceding calendar year have been made and, where relevant, approved by the competent authorities for all agglomerations

and for all major roads and major railways within their territories.

No later than 31 December 2008, Member States shall inform the Commission of all the agglomerations and of all the major roads and major railways within their territories.

3. The strategic noise maps shall satisfy the minimum requirements laid down in Annex IV.

4. Neighbouring Member States shall cooperate on strategic noise mapping near borders.

5. The strategic noise maps shall be reviewed, and revised if necessary, at least every five years after the date of their preparation.

#### Article 8

##### Action plans

1. Member States shall ensure that no later than 18 July 2008 the competent authorities have drawn up action plans designed to manage, within their territories, noise issues and effects, including noise reduction if necessary for:

- (a) places near the major roads which have more than six million vehicle passages a year, major railways which have more than 60 000 train passages per year and major airports;
- (b) agglomerations with more than 250 000 inhabitants. Such plans shall also aim to protect quiet areas against an increase in noise.

The measures within the plans are at the discretion of the competent authorities, but should notably address priorities which may be identified by the exceeding of any relevant limit value or by other criteria chosen by the Member States and apply in particular to the most important areas as established by strategic noise mapping.

2. Member States shall ensure that, no later than 18 July 2013, the competent authorities have drawn up action plans notably to address priorities which may be identified by the exceeding of any relevant limit value or by other criteria chosen by the Member States for the agglomerations and for the major roads as well as the major railways within their territories.

3. Member States shall inform the Commission of the other relevant criteria referred to in paragraphs 1 and 2.

4. The action plans shall meet the minimum requirements of Annex V.

5. The action plans shall be reviewed, and revised if necessary, when a major development occurs affecting the existing noise situation, and at least every five years after the date of their approval.



6. Neighbouring Member States shall cooperate on the action plans for border regions.

7. Member States shall ensure that the public is consulted about proposals for action plans, given early and effective opportunities to participate in the preparation and review of the action plans, that the results of that participation are taken into account and that the public is informed on the decisions taken. Reasonable time-frames shall be provided allowing sufficient time for each stage of public participation.

If the obligation to carry out a public participation procedure arises simultaneously from this Directive and any other Community legislation, Member States may provide for joint procedures in order to avoid duplication.

#### Article 9

##### Information to the public

1. Member States shall ensure that the strategic noise maps they have made, and where appropriate adopted, and the action plans they have drawn up are made available and disseminated to the public in accordance with relevant Community legislation, in particular Council Directive 90/313/EEC of 7 June 1990 on the freedom of access to information on the environment<sup>(1)</sup>, and in conformity with Annexes IV and V to this Directive, including by means of available information technologies.

2. This information shall be clear, comprehensible and accessible. A summary setting out the most important points shall be provided.

#### Article 10

##### Collection and publication of data by Member States and the Commission

1. No later than 18 January 2004, the Commission will submit a report to the European Parliament and the Council containing a review of existing Community measures relating to sources of environmental noise.

2. The Member States shall ensure that the information from strategic noise maps and summaries of the action plans as referred to in Annex VI are sent to the Commission within six months of the dates laid down in Articles 7 and 8 respectively.

3. The Commission shall set up a database of information on strategic noise maps in order to facilitate the compilation of the report referred to in Article 11 and other technical and informative work.

4. Every five years the Commission shall publish a summary report of data from strategic noise maps and action plans. The first report shall be submitted by 18 July 2009.

<sup>(1)</sup> OJ L 158, 23.6.1990, p. 56.

#### Article 11

##### Review and reporting

1. No later than 18 July 2009, the Commission shall submit to the European Parliament and the Council a report on the implementation of this Directive.

2. That report shall in particular assess the need for further Community actions on environmental noise and, if appropriate, propose implementing strategies on aspects such as:

- (a) long-term and medium-term goals for the reduction of the number of persons harmfully affected by environmental noise, taking particularly into account the different climates and different cultures;
- (b) additional measures for a reduction of the environmental noise emitted by specific sources, in particular outdoor equipment, means and infrastructures of transport and certain categories of industrial activity, building on those measures already implemented or under discussion for adoption;
- (c) the protection of quiet areas in open country.

3. The report shall include a review of the acoustic environment quality in the Community based on the data referred to in Article 10 and shall take account of scientific and technical progress and any other relevant information. The reduction of harmful effects and the cost-effectiveness ratio shall be the main criteria for the selection of the strategies and measures proposed.

4. When the Commission has received the first set of strategic noise maps, it shall reconsider:

- the possibility for a 1,5 metre measurement height in Annex I, paragraph 1, in respect of areas having houses of one storey,
- the lower limit for the estimated number of people exposed to different bands of  $L_{den}$  and  $L_{night}$  in Annex VI.

5. The report shall be reviewed every five years or more often if appropriate. It shall contain an assessment of the implementation of this Directive.

6. The report shall, if appropriate, be accompanied by proposals for the amendment of this Directive.

#### Article 12

##### Adaptation

The Commission shall adapt Annex I, point 3, Annex II and Annex III hereto to technical and scientific progress in accordance with the procedure provided for in Article 13(2).

*Article 13***Committee**

1. The Commission shall be assisted by the committee set up by Article 18 of Directive 2000/14/EC.

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

*Article 14***Transposition**

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive no later than 18 July 2004. They shall inform the Commission thereof.

When the Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication.

The methods of making such a reference shall be laid down by the Member States.

2. The Member States shall communicate to the Commission the texts of the provisions of national law that they adopt in the field governed by this Directive.

*Article 15***Entry into force**

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

*Article 16***Addressees**

This Directive is addressed to the Member States.

Done at Luxembourg, 25 June 2002.

*For the European Parliament*

*The President*

P. COX

*For the Council*

*The President*

J. MATAS I PALOU

## ANNEX I

## NOISE INDICATORS

referred to in Article 5

1. Definition of the day-evening-night level  $L_{den}$ 

The day-evening-night level  $L_{den}$  in decibels (dB) is defined by the following formula:

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

in which:

- $L_{day}$  is the A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the day periods of a year,
- $L_{evening}$  is the A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the evening periods of a year,
- $L_{night}$  is the A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year;

in which:

- the day is 12 hours, the evening four hours and the night eight hours. The Member States may shorten the evening period by one or two hours and lengthen the day and/or the night period accordingly, provided that this choice is the same for all the sources and that they provide the Commission with information on any systematic difference from the default option,
- the start of the day (and consequently the start of the evening and the start of the night) shall be chosen by the Member State (that choice shall be the same for noise from all sources); the default values are 07.00 to 19.00, 19.00 to 23.00 and 23.00 to 07.00 local time,
- a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances;

and in which:

- the incident sound is considered, which means that no account is taken of the sound that is reflected at the façade of the dwelling under consideration (as a general rule, this implies a 3 dB correction in case of measurement).

The height of the  $L_{den}$  assessment point depends on the application:

- in the case of computation for the purpose of strategic noise mapping in relation to noise exposure in and near buildings, the assessment points must be  $4,0 \pm 0,2$  m (3,8 to 4,2 m) above the ground and at the most exposed façade; for this purpose, the most exposed façade will be the external wall facing onto and nearest to the specific noise source; for other purposes other choices may be made,
- in the case of measurement for the purpose of strategic noise mapping in relation to noise exposure in and near buildings, other heights may be chosen, but they must never be less than 1,5 m above the ground, and results should be corrected in accordance with an equivalent height of 4 m,
- for other purposes such as acoustical planning and noise zoning other heights may be chosen, but they must never be less than 1,5 m above the ground, for example for:
  - rural areas with one-storey houses,
  - the design of local measures meant to reduce the noise impact on specific dwellings,
  - the detailed noise mapping of a limited area, showing the noise exposure of individual dwellings.

## 2. Definition of the night-time noise indicator

The night-time noise indicator  $L_{night}$  is the A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year;

in which:

- the night is eight hours as defined in paragraph 1,
- a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances, as defined in paragraph 1,
- the incident sound is considered, as laid down in paragraph 1,
- the assessment point is the same as for  $L_{den}$ .

### 3. Supplementary noise indicators

In some cases, in addition to  $L_{den}$  and  $L_{night}$ , and where appropriate  $L_{day}$  and  $L_{evening}$ , it may be advantageous to use special noise indicators and related limit values. Some examples are given below:

- the noise source under consideration operates only for a small proportion of the time (for example, less than 20 % of the time over the total of the day periods in a year, the total of the evening periods in a year, or the total of the night periods in a year),
  - the average number of noise events in one or more of the periods is very low (for example, less than one noise event an hour; a noise event could be defined as a noise that lasts less than five minutes; examples are the noise from a passing train or a passing aircraft),
  - the low-frequency content of the noise is strong,
  - $L_{Amax}$  or SEL (sound exposure level) for night period protection in the case of noise peaks,
  - extra protection at the weekend or a specific part of the year,
  - extra protection of the day period,
  - extra protection of the evening period,
  - a combination of noises from different sources,
  - quiet areas in open country,
  - the noise contains strong tonal components,
  - the noise has an impulsive character.
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## ANNEX II

## ASSESSMENT METHODS FOR THE NOISE INDICATORS

referred to in Article 6

### 1. Introduction

The values of  $L_{den}$  and  $L_{night}$  can be determined either by computation or by measurement (at the assessment position). For predictions only computation is applicable.

Provisional computation and measurement methods are set out in paragraphs 2 and 3.

### 2. Interim computation methods for $L_{den}$ and $L_{night}$

#### 2.1. Adaptation of existing national computation methods

If a Member State has national methods for the determination of long-term indicators those methods may be applied, provided that they are adapted to the definitions of the indicators set out in Annex I. For most national methods this implies the introduction of the evening as a separate period and the introduction of the average over a year. Some existing methods will also have to be adapted as regards the exclusion of the façade reflection, the incorporation of the night and/or the assessment position.

The establishment of the average over a year requires special attention. Variations in emission and transmission can contribute to fluctuations over a year.

#### 2.2. Recommended interim computation methods

For Member States that have no national computation methods or Member States that wish to change computation method, the following methods are recommended:

For INDUSTRIAL NOISE: ISO 9613-2: 'Acoustics — Abatement of sound propagation outdoors, Part 2: General method of calculation'.

Suitable noise-emission data (input data) for this method can be obtained from measurements carried out in accordance with one of the following methods:

- ISO 8297: 1994 'Acoustics — Determination of sound power levels of multisource industrial plants for evaluation of sound pressure levels in the environment — Engineering method',
- EN ISO 3744: 1995 'Acoustics — Determination of sound power levels of noise using sound pressure — Engineering method in an essentially free field over a reflecting plane',
- EN ISO 3746: 1995 'Acoustics — Determination of sound power levels of noise sources using an enveloping measurement surface over a reflecting plane'.

For AIRCRAFT NOISE: ECAC.CEAC Doc. 29 'Report on Standard Method of Computing Noise Contours around Civil Airports', 1997. Of the different approaches to the modelling of flight paths, the segmentation technique referred to in section 7.5 of ECAC.CEAC Doc. 29 will be used.

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 input data concerning emission, these documents refer to the 'Guide du bruit des transports terrestres, fascicule prévision des niveaux sonores, CETUR 1980'.

For RAILWAY NOISE: The Netherlands national computation method published in 'Reken- en Meetvoorschrift Railverkeerslawaaai '96, Ministerie Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 20 November 1996'.

Those methods must be adapted to the definitions of  $L_{den}$  and  $L_{night}$ . No later than 1 July 2003 the Commission will publish guidelines in accordance with Article 13(2) on the revised methods and provide emission data for aircraft noise, road traffic noise and railway noise on the basis of existing data.

### 3. Interim measurement methods for $L_{den}$ and $L_{night}$

If a Member State wishes to use its own official measurement method, that method shall be adapted in accordance with the definitions of the indicators set out in Annex I and in accordance with the principles governing long-term average measurements stated in ISO 1996-2: 1987 and ISO 1996-1: 1982.

If a Member State has no measurement method or if it prefers to apply another method, a method may be defined on the basis of the definition of the indicator and the principles stated in ISO 1996-2: 1987 and ISO 1996-1: 1982.

Measurement data in front of a façade or another reflecting element must be corrected to exclude the reflected contribution of this façade or element (as a general rule, this implies a 3 dB correction in case of measurement).

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ANNEX III

**ASSESSMENT METHODS FOR HARMFUL EFFECTS**

referred to in Article 6(3)

Dose-effect relations should be used to assess the effect of noise on populations. The dose-effect relations introduced by future revisions of this Annex in accordance with Article 13(2) will concern in particular:

- the relation between annoyance and  $L_{den}$  for road, rail and air traffic noise, and for industrial noise,
- the relation between sleep disturbance and  $L_{night}$  for road, rail and air traffic noise, and for industrial noise.

If necessary, specific dose-effect relations could be presented for:

- dwellings with special insulation against noise as defined in Annex VI,
  - dwellings with a quiet façade as defined in Annex VI,
  - different climates/different cultures,
  - vulnerable groups of the population,
  - tonal industrial noise,
  - impulsive industrial noise and other special cases.
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## ANNEX IV

**MINIMUM REQUIREMENTS FOR STRATEGIC NOISE MAPPING**

referred to in Article 7

1. A strategic noise map is the presentation of data on one of the following aspects:
  - an existing, a previous or a predicted noise situation in terms of a noise indicator,
  - the exceeding of a limit value,
  - the estimated number of dwellings, schools and hospitals in a certain area that are exposed to specific values of a noise indicator,
  - the estimated number of people located in an area exposed to noise.
2. Strategic noise maps may be presented to the public as:
  - graphical plots,
  - numerical data in tables,
  - numerical data in electronic form.
3. Strategic noise maps for agglomerations shall put a special emphasis on the noise emitted by:
  - road traffic,
  - rail traffic,
  - airports,
  - industrial activity sites, including ports.
4. Strategic noise mapping will be used for the following purposes:
  - the provision of the data to be sent to the Commission in accordance with Article 10(2) and Annex VI,
  - a source of information for citizens in accordance with Article 9,
  - a basis for action plans in accordance with Article 8.

Each of those applications requires a different type of strategic noise map.

5. Minimum requirements for the strategic noise maps concerning the data to be sent to the Commission are set out in paragraphs 1.5, 1.6, 2.5, 2.6 and 2.7 of Annex VI.
6. For the purposes of informing the citizen in accordance with Article 9 and the development of action plans in accordance with Article 8, additional and more detailed information must be given, such as:
  - a graphical presentation,
  - maps disclosing the exceeding of a limit value,
  - difference maps, in which the existing situation is compared with various possible future situations,
  - maps showing the value of a noise indicator at a height other than 4 m where appropriate.

The Member States may lay down rules on the types and formats of these noise maps.

7. Strategic noise maps for local or national application must be made for an assessment height of 4 m and the 5 dB ranges of  $L_{den}$  and  $L_{night}$  as defined in Annex VI.
  8. For agglomerations separate strategic noise maps must be made for road-traffic noise, rail-traffic noise, aircraft noise and industrial noise. Maps for other sources may be added.
  9. The Commission may develop guidelines providing further guidance on noise maps, noise mapping and mapping softwares in accordance with Article 13(2).
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## ANNEX V

**MINIMUM REQUIREMENTS FOR ACTION PLANS**

referred to in Article 8

1. An action plan must at least include the following elements:
    - a description of the agglomeration, the major roads, the major railways or major airports and other noise sources taken into account,
    - the authority responsible,
    - the legal context,
    - any limit values in place in accordance with Article 5,
    - a summary of the results of the noise mapping,
    - an evaluation of the estimated number of people exposed to noise, identification of problems and situations that need to be improved,
    - a record of the public consultations organised in accordance with Article 8(7),
    - any noise-reduction measures already in force and any projects in preparation,
    - actions which the competent authorities intend to take in the next five years, including any measures to preserve quiet areas,
    - long-term strategy,
    - financial information (if available): budgets, cost-effectiveness assessment, cost-benefit assessment,
    - provisions envisaged for evaluating the implementation and the results of the action plan.
  2. The actions which the competent authorities intend to take in the fields within their competence may for example include:
    - traffic planning,
    - land-use planning,
    - technical measures at noise sources,
    - selection of quieter sources,
    - reduction of sound transmission,
    - regulatory or economic measures or incentives.
  3. Each action plan should contain estimates in terms of the reduction of the number of people affected (annoyed, sleep disturbed, or other).
  4. The Commission may develop guidelines providing further guidance on the action plans in accordance with Article 13(2).
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## ANNEX VI

## DATA TO BE SENT TO THE COMMISSION

referred to in Article 10

The data to be sent to the Commission are as follows:

**1. For agglomerations**

- 1.1. A concise description of the agglomeration: location, size, number of inhabitants.
- 1.2. The responsible authority.
- 1.3. Noise-control programmes that have been carried out in the past and noise-measures in place.
- 1.4. The computation or measurement methods that have been used.
- 1.5. The estimated number of people (in hundreds) living in dwellings that are exposed to each of the following bands of values of  $L_{den}$  in dB 4 m above the ground on the most exposed façade: 55-59, 60-64, 65-69, 70-74, > 75, separately for noise from road, rail and air traffic, and from industrial sources. The figures must be rounded to the nearest hundred (e.g. 5 200 = between 5 150 and 5 249; 100 = between 50 and 149; 0 = less than 50).

In addition it should be stated, where appropriate and where such information is available, how many persons in the above categories live in dwellings that have:

- special insulation against the noise in question, meaning special insulation of a building against one or more types of environmental noise, combined with such ventilation or air conditioning facilities that high values of insulation against environmental noise can be maintained,
- a quiet façade, meaning the façade of a dwelling at which the value of  $L_{den}$  four metres above the ground and two metres in front of the façade, for the noise emitted from a specific source, is more than 20 dB lower than at the façade having the highest value of  $L_{den}$ .

An indication should also be given on how major roads, major railways and major airports as defined in Article 3 contribute to the above.

- 1.6. The estimated total number of people (in hundreds) living in dwellings that are exposed to each of the following bands of values of  $L_{night}$  in dB 4 m above the ground on the most exposed façade: 50-54, 55-59, 60-64, 65-69, > 70, separately for road, rail and air traffic and for industrial sources. These data may also be assessed for value band 45-49 before the date laid down in Article 11(1).

In addition it should be stated, where appropriate and where such information is available, how many persons in the above categories live in dwellings that have:

- special insulation against the noise in question, as defined in paragraph 1.5,
- a quiet façade, as defined in paragraph 1.5.

It must also be indicated how major roads, major railways and major airports contribute to the above.

- 1.7. In case of graphical presentation, strategic maps must at least show the 60, 65, 70 and 75 dB contours.
- 1.8. A summary of the action plan covering all the important aspects referred to in Annex V, not exceeding ten pages in length.

**2. For major roads, major railways and major airports**

- 2.1. A general description of the roads, railways or airports: location, size, and data on the traffic.
- 2.2. A characterisation of their surroundings: agglomerations, villages, countryside or otherwise, information on land use, other major noise sources.
- 2.3. Noise-control programmes that have been carried out in the past and noise-measures in place.
- 2.4. The computation or measurement methods that have been used.
- 2.5. The estimated total number of people (in hundreds) living outside agglomerations in dwellings that are exposed to each of the following bands of values of  $L_{den}$  in dB 4 m above the ground and on the most exposed façade: 55-59, 60-64, 65-69, 70-74, > 75.

In addition it should be stated, where appropriate and where such information is available, how many persons in the above categories live in dwellings that have:

- special insulation against the noise in question, as defined in paragraph 1.5,
- a quiet façade, as defined in paragraph 1.5.

2.6. The estimated total number of people (in hundreds) living outside agglomerations in dwellings that are exposed to each of the following bands of values of  $L_{\text{night}}$  in dB 4 m above the ground and on the most exposed façade: 50-54, 55-59, 60-64, 65-69, > 70. These data may also be assessed for value band 45-49 before the date laid down in Article 11(1).

In addition it should be stated, where appropriate and where such information is available, how many persons in the above categories live in dwellings that have:

- special insulation against the noise in question, as defined in paragraph 1.5,
- a quiet façade, as defined in paragraph 1.5.

2.7. The total area (in km<sup>2</sup>) exposed to values of  $L_{\text{den}}$  higher than 55, 65 and 75 dB respectively. The estimated total number of dwellings (in hundreds) and the estimated total number of people (in hundreds) living in each of these areas must also be given. Those figures must include agglomerations.

The 55 and 65 dB contours must also be shown on one or more maps that give information on the location of villages, towns and agglomerations within those contours.

2.8. A summary of the action plan covering all the important aspects referred to in Annex V, not exceeding ten pages in length.

### 3. Guidelines

The Commission may develop guidelines to provide further guidance on the above provision of information, in accordance with Article 13(2).

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