The results of the CEDR Project Group Road Noise 2 (2009-2013)

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Conférence Européenne des Directeurs des Routes
Conference of European Directors of Roads

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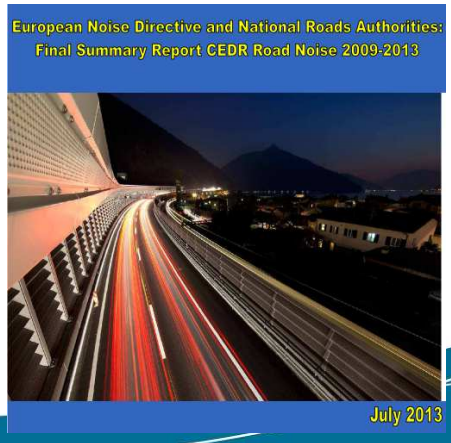
Introduction

"The reduction of traffic noise is a major challenge for National Road Authorities in Europe"



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Agenda

- Introduction CEDR
- Objectives & Process
- Results & Recommendations
  - Subgroup reports
  - Executive summary
- Conclusion

Introduction CEDR

- What is CEDR?
  - "Conference of European Directors of Roads"
- Coorperation of National Road Authorities of EU
  - Projectgroup Road Noise 2
-

Austria	Mr Klaus Gspan and Mr Christof Rehling
Belgium	Ms Barbara Vanhooreweder
Cyprus	Ms Elena Sophocleous
Denmark	Mr Jakob Fryd
Estonia	Mr Villu Lükk
Finland	Mr Arto Kärkkäinen
France	Mr Marc Di Martino and Mr Emmanuel Le Duc
Germany	Mr Wolfram Bartolomaeus
Greece	Ms Efterpi Giannopoulou
Italy	Ms Patrizia Bellucci
Latvia	Mr Guntis Graveris
Norway	Ms Ingunn Milford
Poland	Mr Jacek Wojtowicz
Spain	Mr Jesús Rubio Alférez
Sweden	Mr Kjell Strömmer

Objectives CEDR SP2

Overall goal from CEDR Strategic Plan 2009-2013 :

- Establish state of the art standards in line with objectives of NRA's and facilitate the use of these new standards
- Monitor EU lawmaking and take action on EU Directives
- Develop and share knowledge on sustainable infrastructure

Objectives Projectgroup RN2

Table 1 : CEDR RN2 objectives in accordance with the goals of the CEDR Strategic Plan

	CEDR Road Noise 2 objective	TD Construction goal	
1	Review CEDR members approach to strategic noise mapping of major roads in 2007 with a view to identifying best practice for the second round in 2012	Develop and share knowledge on a sustainable infrastructure	Noise Mapping
2	Assess CEDR members responses to the European Commission and the European Environment Agency Working Group on the Assessment of Exposure to Noise (WG-AEN) questionnaire on validation of national noise mapping methods and software in relation to assessment methods for noise indicators in relation to Directive 2002/49/EC	Take appropriate action on EU Directives	Noise Mapping
3	Review and assess CEDR members approach to action planning in 2008 with a view to providing best practice advice for the second round in 2013	Develop and share knowledge on a sustainable infrastructure	EU action plans
4	Undertake a survey of CEDR members ambitions regarding the (ongoing) procedure in the European Parliament (early 2009) on the new regulation on advanced safety features and tyres COM(2008) 316 (especially the tighter noise emission requirements (2001/43/EC)	Monitor European lawmaking	Tyre & Vehicle Noise
5	Assess CEDR members views and support for tyre noise limits for heavy duty vehicles in COM(2008) 316	[illegible]	Tyre & Vehicle Noise
6	Assess and review CEDR members views regarding the Tyre Label Directive		Tyre & Vehicle Noise

Objectives Projectgroup RN2

7	Assess and review engine/vehicle noise limits	Establish and update modern standards in line wit objectives of the NRAs
8	Review CEDR members position regarding input data requirements of the European Noise Model	Establish and update modern standards in line with the objectives of the NRAs
9	Review acoustic characteristics of silent pavements (durability, labelling and conformity checking)	Establish and update modern standards in line objectives of the NRAs
10	Noise barrier standards and improvements (design, absorption, multifunction)	Develop and share k a sustainable infrastr
11	Monitor the European Position on Europe wide noise limit values	Monitor European la

Tyre & Vehicle Noise

EU CNOSSOS

Not adressed -> RN3

Not adressed -> RN3

Not adressed -> RN3

Process CEDR RN2

4 initial subgroups (main topics) :

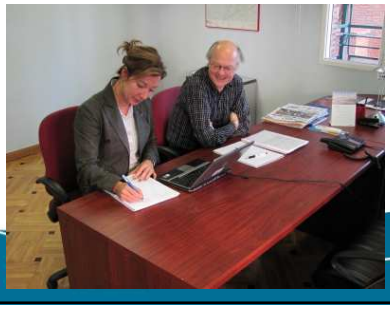
- EU Noise Mapping
- EU Action plans
- Traffic Noise abatement "Value for Money"
- EU CNOSSOS

2 added subgroups :

- Road traffic research needs
- Factsheets (minor topics)

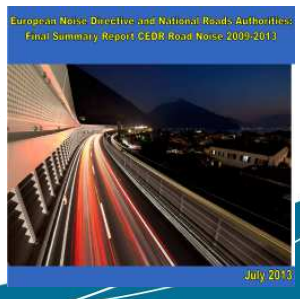
4 Subgroups at work






Results

- In total 6 reports and 13 recommendations for improvements



Results Noise Mapping

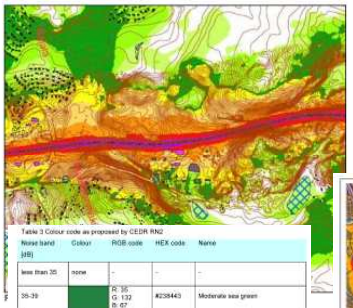


Table 3 Colour code as proposed by CEDR RN2

Noise band (dB)	Colour	RGB code	HEX code	Name
less than 35	none	-	-	-
35-39		R: 35 G: 132 B: 67	#238443	Moderate sea green
40-44		R: 120 G: 198 B: 121	#78C679	Greyish green
45-49		R: 194 G: 230 B: 153	#C2E699	Light greyish chartreuse green
50-54		R: 255 G: 255 B: 178	#FFFFB2	Pale yellow
55-59		R: 254 G: 204 B: 92	#FECC5C	Light brilliant amber
60-64		R: 252 G: 141 B: 60	#FD8D3C	Brilliant tangelo
65-69		R: 255 G: 0 B: 0	#FF0000	Light brilliant red
70-74		R: 179 G: 0 B: 34	#B30022	Moderate amaranth
75-79		R: 103 G: 3 B: 59	#67033B	Dark rose
80 and more		R: 28 G: 0 B: 84	#1C0054	Deep blue violet

Inaccurancy of input data

Uncertainties for lower noise bands Lden < 55 Lnight <45

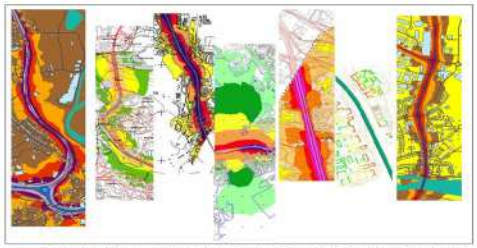


Figure 1 Sample of noise maps from a number of member states with different colour regimes

No Standardisation in maps

Recommendation Noise Mapping

Standardise and simplify methods to minimise costs (EU CNOSSOS)

Recommendation 1

To minimise costs associated with undertaking the required EU strategic noise mapping in 2017, all NRAs should closely monitor or actively participate (through relevant channels in their country e.g., Noise Regulatory Committee representative) in the development of the proposed new calculation methodology (CNOSSOS-EU) to ensure that a simplified approach rather than a more advanced approach is adopted. They should also inform the relevant representative that the introduction of noise bands lower than 55 dB L_{den} and 45 dB L_{night} beyond the validation distance of a noise calculation method will only add additional uncertainty and inaccuracy to the reported noise mapping data. This would also result in NRAs having to incur additional costs to augment current data collection methodologies.

Recommendation 2

NRAs should promote, whe…urs in any future noise mapping programmes. The …o compare noise maps across member states.

Promote use of colour proposal

Results Action planning

Table 4 Noise limit values/guidance values used by certain NRAs when considering noise mitigation in noise action plan

Member state	Limit/Guidance value
Austria	L_{den} = 60 dB, L_{night} = 50 dB
Belgium F	Existing roads: L_{den} = 70 dB and L_{night} = 60 dB; New roads: L_{den} = 60 dB and L_{night} = 50 dB
Belgium W	L_{den}: 65 dB (cities) and 62 dB (outside cities) in t; L_{night}: 55 dB (cities) and 52 dB (outside cities) in t
Cyprus	L_{den} = 70 dB, L_{night} = 60 dB
Denmark	L_{den} = 58 dB (consider noise reducing asphal facade insulation)
Germany	L_{den} = 60 dB, L_{night} = 47 dB
Greece	L_{den} = 70 dB, L_{night} = 60 dB
Ireland	The choice of an 'Action Level' was left to the discretion of the Action Planning Body i.e. the Local Authorities. EPA recommends that proposed onset levels for assessment of noise mitigation measures for noise due to road traffic are as follows: L_{den} = 70 dB and L_{night} = 57 dB
Netherlands	They took all noise measures from road projects an years 2008 till 2013 for a start. These measures were outcome of these measures in terms of noise levels at after calculations concentrated on the effect on the amo above 65 dB L_{den}. Although exceeding national noise
Norway	
Poland	
United Kingdom	

High variation in limit values AP irt measures

High variation in costs related to AP

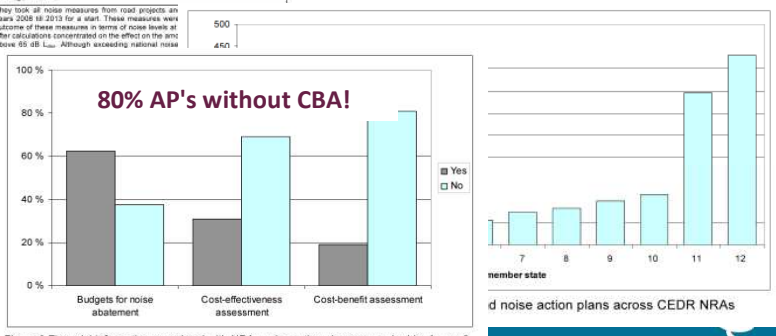


Figure 6 Financial information associated with NRAs noise action plans as required by Annex 5 of END

d noise action plans across CEDR NRAs

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Recommendation Action plans

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Integrated action plans and close cooperation between EU NRA's on action plans

Recommendation 4

NRAs should give consideration to integrating the content of noise action plans into their respective planning process or asset management programmes.

Prioritise the developement of a harmonised cost benefit assesment tool for analyses of noise action plans

Recommendation 7

NRAs should contact their national noise regulatory committee representative to request the European Commission to prioritise the development a harmonised cost-benefit assessment tool for analyses of noise action plans. CEDR RN3 should provide input to the EC on costs and benefits as needed.

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Results "Value for Money"

Noise reduction at source is most cost effective measure (best "value for money")

Table 5 Possible noise abatement measures, their potential for reduction in road traffic noise annoyance and the cost of reducing the number of annoyed people

Noise abatement measure	Reduction annoyed people (million)	Cost reduction annoyed people (EUR per person per year)
Vehicle noise reduction: 5 dB	31.5	16
Vehicle noise reduction: 3 dB	19.7	18
Thin layer asphalt	2.2	136
Single layer porous asphalt	1.1	290
Façade insulation [1]	0.5	570
Double layer porous asphalt	0.3	940
Noise barriers	0.07	4200

[1] Façade insulation measure used is replacing two windows, assuming 60 % effect on annoyance reduction.

Recommendations Value for money

Close liaison with vehicle and tyre manufacturers

Recommendation 8

CEDR should liaise closely with interested parties such as the vehicle and tyre manufactures to formulate a combination of measures that are appropriate for the treatment of road traffic noise. In addition, CEDR should also give consideration to preparing a position paper for the Commission on the level of noise abatement achieved from the various noise mitigating measures used on national road schemes.

Exploit low noise pavements where appropriate

Recommendation 9

With regard to mitigating noise at locations in close proximity to major roads, NRAs should exploit low noise pavements, where appropriate, as a first option as they have been shown to be the most cost-effective noise abatement measure. This can be used in combination with other measures such as traffic management.

The results EU CNOSSOS

- Participation in Expert groups (3 members CEDR)
- During process CNOSSOS recommendation on methods and input data
- Monitoring will go on during implementation phase (RN3)

The recommendations EU CNOSSOS

On the topic of CNOSSOS-EU the following recommendations were given in the first drafting phase of CNOSSOS-EU:

- input data for traffic flows should ideally be available from regular national traffic counting that is already undertaken by the NRAs.
- the effect of low noise road surface should be derived from national datasets to account for national differences.
- geometry of traffic lanes and noise screens should be available from existing databases that were generated during the first two rounds of strategic noise mapping.
- for the propagation model, the type of ground (G value), especially in close proximity to roads should be given by default values.

Main recommendations

Recommendation
To minimise costs associated with undertaking EU strategic noise mapping in 2017, all NRAs should closely m… …untry e.g., Noise Regulatory … …osed new calculation metho… …her than a more complex ap… …ional costs for NRAs in order to augment the current approaches used for data collection on their respective networks.

Standardise and simplify methods to minimise costs (EU CNOSSOS)

Recommendation
NRAs should initially define the status of noise actions plans within their organisation and where feasible incorpora… …aintenance processes in orde… …oise. Also, individual NRAs, … …needed to comply with EU le… …aintenance and noise mitigat… …the END action planning requirements available to European stakeholders.

Define status and integrate action plans in road planning and maintenance to achieve quick wins in mitigation.

Recommendation
CEDR should liaise cl… …anufacturers to formulate a combinati… …traffic noise. In addition, CEDR should… …he Commission on the level noise ab… …sures used on national road scheme… …ximity to major roads, NRAs should … …as they have been shown to be the… …s.

Close liaison with vehicle and tyre manufacturers to find the most cost effective traffic noise measures.

Conclusions 4 years work

- Objectives were met :
  - contribution to standardisation EU CNOSSOS & Noise mapping
  - exchange/sharing of knowledge (Noise mapping/action plans & vehicle noise)
  - monitor EU lawmaking (results "Value for money report" & END evaluation)
- New research needs for RN3 -> 2013 -2017
- Recommendations supported by CEDR EB and GB
- Implementation of recommendations within NRA's -> lower costs and "state of the art" noise abatement

Meeting Field trips

Thanks!!!

Special thanks : Jesús Alférez, Jakob Fryd, Vincent O'Malley

Ingunn Milford (co-authors)

Thank you for your attention!

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