QSIDE

REPORT

Title	**QSIDE workshop in Lyon on 24 April 2013 (Action 6)**
Status	**Final**
Authors	**Erik Salomons, Mikael Ögren, Carlo Schoonebeek, Martin Knape, Frits van den Berg**
Deadline report	**30 August 2013**

PROJECT

Acronym	QSIDE
Project title	The positive effects of quiet facades and quiet urban areas on traffic noise annoyance and sleep disturbance
Project start date	1 September 2010
Duration of the project	36 months

Coordinating partner	TNO Delft	TNO	NL
Other partners	Universiteit Gent	UGENT	BE
	Chalmers Teknsika Högskola AB	CUT	SE
	University of Gothenburg	UGOT	SE
	VTI, Statens väg- och transportforskningsinstitut	VTI	SE
	Gemeente Amsterdam	AMS	NL
	City of Gothenburg	GOT	SE

FUNDING

Funding	Project funded by the European Commission
Funding program	LIFE+ program Environment and Eco-innovation
Project number	LIFE09 ENV/NL/000423

Contents

Objective and organization of the workshop

QSIDE is a European project with Dutch, Belgian and Swedish partners focusing on the positive effects of quiet façades and quiet urban areas. The project runs from 1 Sep 2010 until 30 August 2013. The project is partially funded by the European Life+ program.

A major objective of QSIDE is to demonstrate how European cities can effectively reduce harmful effects of traffic noise (annoyance and sleep disturbance) by protecting and creating quiet façades and quiet urban areas. The protection of quiet façades and quiet urban areas is supported by the European Noise Directive 2002/49/EC (END).

Based on scientific research in QSIDE (both acoustics research and human response research), QSIDE has formulated recommendations to European cities on the protection and creation of quiet façades and quiet urban areas. The recommendations have been laid down in a website (www.qside.eu/nweb) and will also be described in a document.

The recommendations have also been presented at a workshop organized by QSIDE on 24 April 2013 in Lyon. The title of the workshop was:

> **Quiet façades and quiet urban areas**
> Benefits for people
> Implementation in urban noise policy

The invitation for the QSIDE workshop is shown in Figure 1. The invitation was sent to a large number of potential attendants, including about 60 partners of the working group Noise of the Eurocities network, and to about 40 other relevant persons. In addition the invitation was sent to representatives of five French cities near Lyon: Grenoble, Saint-Etienne, Nice, Montpellier, and Aix-en-Provence.

The QSIDE workshop preceded a meeting of the working group Noise of Eurocities (25-26 April). The idea was that in this way we would attract more participants. However, the number of participants was a bit disappointing, possibly because of limited financial resources of cities in this period of financial crisis.

The total number of persons attending the workshop was 13. Three cities were represented at the workshop: Berlin, The Hague, and Lyon. In addition the QSIDE partners Amsterdam and Gothenburg were present.

Further, three partners of the related European projects HARMONICA, HUSH, and QUADMAP attended the workshop. This gave us the opportunity to have valuable discussions on the relations between the three projects and QSIDE.

Program of the workshop

The program of the workshop was as follows.

1. Presentation of QSIDE – by Erik Salomons, Frits van den Berg, Carlo Schoonebeek, Martin Knape, and Mikael Ogren
2. Presentation of HARMONICA – by Vincent Gissinger
3. Presentation of HUSH and QUADMAP – by Francesco Borchi
4. Discussions.

Since the group was small, discussions were held during the presentations rather than at the end of the workshop.
The sheets of the QSIDE presentation are reproduced in Appendix A. The presentation follows the structure of the QSIDE dissemination website www.qside.eu/nweb/.
The HARMONICA project was presented by Vincent Gissinger of Acoucité Lyon. The sheets of the presentation are reproduced in Appendix B.
The HUSH and HARMONICA projects were presented by Francesco Borchi of the University of Florence. The sheets of the presentation are reproduced in Appendix C.

Summary of presentations and discussions

Here we give a summary of the presentations and the most important discussion points and feedback received from the attendants during the workshop.

QSIDE presentation
First Erik presented an overview of the project, following the Overview section of the QSIDE dissemination website. The QSIDE recommendations for quiet façades and quiet areas were presented (45-50 dB Lden / 45-55 dB Lday) which were explained in more detail by Frits. The importance of 'other qualities' (vegetation, attractive architecture, …) was stressed, as well as the fact that *direct* traffic noise exposure at quiet façades should be avoided.
Carlo and Martin presented practical approaches followed in Amsterdam and Gothenburg, including both urban policy with respect to quiet façades and urban strategies for creating quiet façades. Various pictures were shown to illustrate buildings and noise barriers creating shielded areas in cities.
Mikael presented the new noise model for quiet places developed in QSIDE, taking into account multiple canyon reflections and turbulent scattering in an efficient way. The model is an extension of current noise-mapping models. Erik presented the QSIDE human response model for the positive effects of quiet façades on traffic noise annoyance (at home). The model gives an annoyance correction (positive or negative) with respect to an average situation, i.e. with respect to average noise levels at 'backsides' of houses.

In the discussion on the QSIDE presentation, the following questions / points came up.

1 Criteria for sunlight and building orientation may conflict with criteria for a quiet façade (a French guideline requires at least 2 hours of direct sunlight per day).

2 Other non-acoustical factors are important: air pollution, quality of the living environment, …
3 The absorbing façade material used in Amsterdam (coulisse damper) may suffer from contamination.
4 The question was raised if the QSIDE noise model is included in the development of the EU CNOSSOS model. Answer: no (not yet).
5 Are the current estimates of traffic-noise effects (END) underestimates in view of QSIDE developments? Answer: no, QSIDE yields only a refinement of noise exposure and effects, with positive and negative annoyance corrections.

HARMONICA
HARMONICA is a Life+ project coordinated by BRUITPARIF (Paris). Acoucité (Lyon) is the other beneficiary of the project. The project runs from 10/1/11 until 9/30/14.
A major element of the HARMONICA project is the development of a new noise index called CNI (Common Noise Index). This index combines noise exposure and annoyance in a single index, and therefore should be more understandable for the public than classical quantities like the A-weighted noise level. The development of CNI is based on various surveys and interviews. Noise monitoring is another important element of HARMONICA.

HUSH and QUADMAP
HUSH is a Life+ project with only Italian partners. Coordinator is the University of Florence. The project runs from 1/1/10 until 31/12/13. An objective of the project is the harmonization of various types of (national and European) noise action plans.
QUADMAP is a Life+ project coordinated by the University of Florence. The project runs from 1/9/11 until 30/9/14.
For QSIDE, the most relevant element of HUSH and QUADMAP is the development of a method for identifying quiet urban areas. Different approaches are considered. One approach is to consider not only noise criteria (e.g. Lday < 55 dB and less than 12 noise events louder than 70 dB) but also the size of the area (lager than 1000 m^2).
A stepwise approach for the selection of quiet areas is developed. Different aspects of quiet areas are considered:
- Use and function of the area
- Noise levels
- Complementary aspects (equity distribution, opinions of citizens, …)

Pilot studies of the approach are performed in the Netherlands, Spain, and Bilbao. An example of 130 potential quiet areas in the city of Utrecht (NL) can be found on the last page of Appendix A.

Conclusion

The workshop was a useful opportunity for presenting and discussing QSIDE recommendations to European cities on quiet façades and quiet urban areas. Feedback received from the attendants confirmed the importance of non-acoustic factors and ‘other qualities’ of quiet urban areas, which will be part of the final QSIDE recommendations.

Figure 1a. Page 1 of the invitation for the QSIDE workshop.

Figure 1b. Page 2 of the invitation for the QSIDE workshop.

QSIDE workshop

Quiet façades and quiet urban areas
benefits for people and implementation in urban noise policy

On Wednesday 24 April 2013, the QSIDE project team will organize a workshop in Lyon preceding the Eurocities WG Noise spring meeting.
The workshop is intended for officials from local authorities who are interested in the benefits of quiet façades and quiet areas.
The workshop will focus on the following questions:

- What are the characteristics of quiet façades and quiet areas? How can they be defined?
- How can cities implement quiet façades and quiet areas in their traffic noise policies?

A summary of results of the QSIDE project will also be presented at the workshop, including:

- the calculation of traffic noise levels in shielded urban locations,
- the reduction of traffic noise annoyance and sleep disturbance due to quiet façades and quiet areas.

The QSIDE team welcomes feedback from cities including experience with urban planning and building policies. The feedback will be used in the final recommendations of QSIDE.

Program 24 April 2013, 13:30-16:30h
1. QSIDE results
2. Related EU projects, QUADMAP, HARMONICA, HUSH
3. Discussion

A preview of QSIDE results is available at www.qside.eu/nweb

24 April 2013, 13:30 – 16:30h, QSIDE workshop
25 and 26 April 2013, Eurocities WG Noise

Participants of the QSIDE workshop are also invited to attend the Eurocities WG Noise meeting.
Information on Eurocities WG Noise can be found at http://workinggroupnoise.web-log.nl.

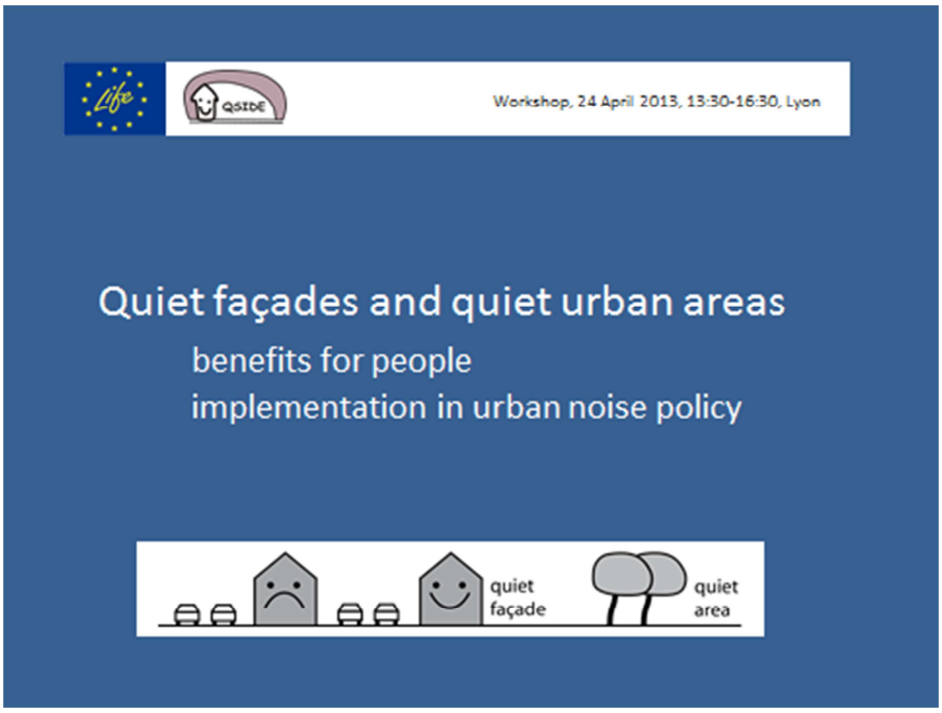
Registration
To attend the QSIDE workshop, please send an email to
Erik Salomons (erik.salomons@tno.nl)
or Mikael Ögren (mikael.ogren@vti.se).

Location
The QSIDE workshop and the Eurocities WG Noise meeting will be held at the following address:
Grand Lyon, Hôtel de communauté, 20 rue du Lac, Lyon

About QSIDE
The main objective of the project QSIDE is to demonstrate how European cities can effectively reduce harmful effects of traffic noise (annoyance and sleep disturbance) by protecting and creating *quiet façades and quiet areas*. The protection of quiet façades and quiet areas is supported by the European Noise Directive 2002/49/EC. QSIDE will deliver a new method for calculating noise levels at shielded locations, and a new method for assessing the positive effects of quiet façades and quiet areas on people. QSIDE results provide support for taking into account quiet facades and areas in urban environmental policy. The QSIDE project is partially funded by the European Life+ program.

Appendix A: QSIDE presentation

Presented by Erik Salomons, Frits van den Berg, Carlo Schoonebeek, Martin Knape, and Mikael Ögren at the QSIDE workshop.



Erik

QSIDE, a Life+ project (2010-2013)

Objectives
New prediction methods - decibels & effects
Recommendations to cities

Partners
TNO Delft
Gothenburg University
Ghent University
Chalmers
VTI
City of Amsterdam
City of Gothenburg

QSIDE | overview | quiet places | examples | scientific support

Erik

Environmental Noise Directive


L 189/12 EN Official Journal of the European Communities 18.7.2002

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

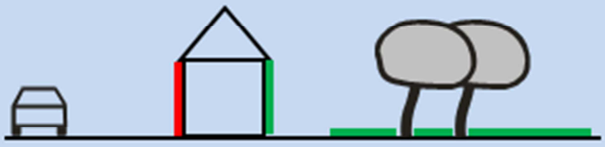
THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles (5), Council Directive 77/311/

focus on most-exposed façade

access to quiet façade

protect quiet areas



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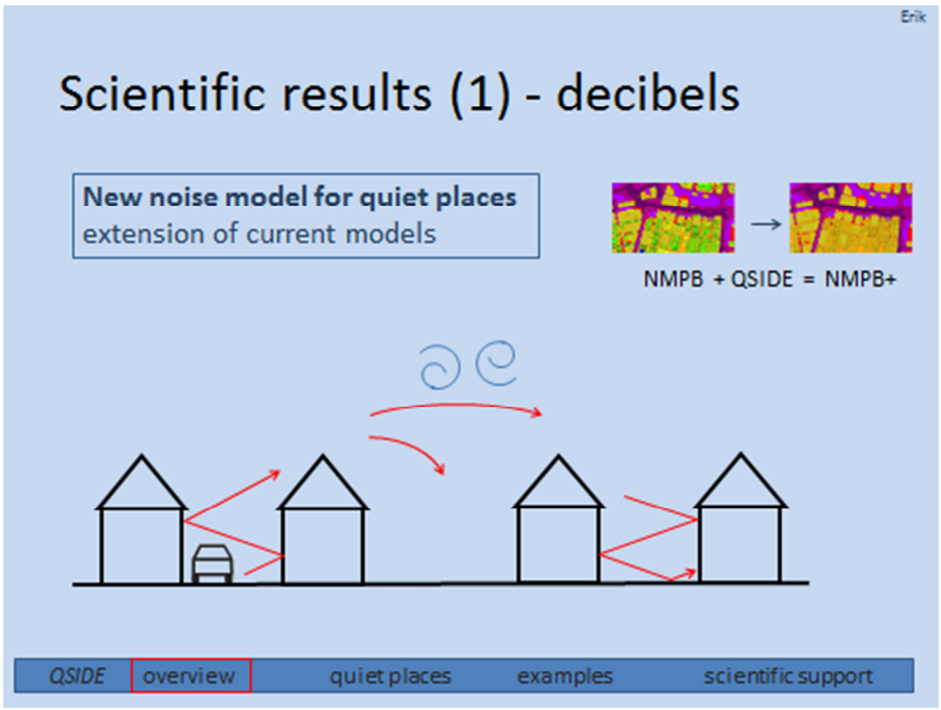
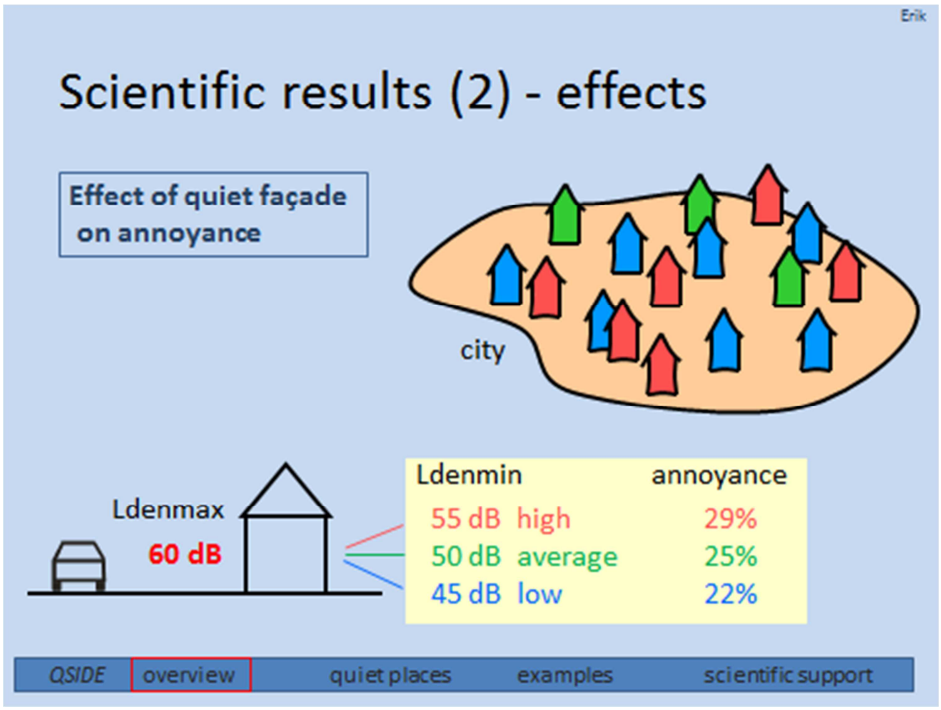

Erik
Scientific results (1) - decibels
New noise model for quiet places
extension of current models
NMPB + QSIDE = NMPB+
QSIDE
overview
quiet places
examples
scientific support


Erik
Scientific results (2) - effects
Effect of quiet façade
on annoyance
city
Ldenmax
60 dB
Ldenmin
annoyance
55 dB high
29%
50 dB average
25%
45 dB low
22%
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examples
scientific support

Erik

Annoyance at home / outdoors

QSIDE: annoyance at home

CityHush: annoyance in park by traffic noise

Lday	annoyance
60 dB	80%
55 dB	60%
50 dB	40%

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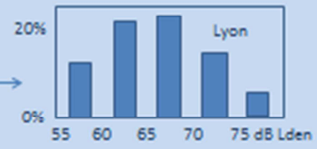
Erik

Noise policy of cities (1)

Traffic noise
10% annoyed
3% highly sleep-disturbed

Most important
reduce levels at most-exposed façade

Secondary
quiet façades and quiet areas



Several cities consider
QF, QA in noise policy

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Erik

Noise policy of cities (2)

QSIDE recommendations

45 – 50 dB Lden at quiet façade
45 – 55 dB Lday in quiet area

+ other qualities →

Avoid
direct exposure
at quiet façade

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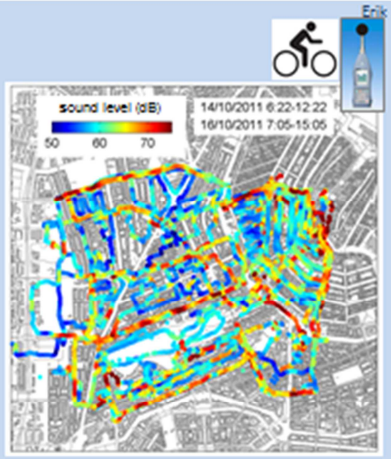
Erik

Noise policy of cities (3)

Protection of quiet areas
- parks
- quiet quarters



Limit traffic on busy streets
Avoid increase on smaller streets

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Frits

What are quiet places?

Quiet places considered:
- quiet facades of dwellings
- quiet areas in urban environments

Qside results mostly based on effects of (reduced) road traffic noise

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Frits

What is a quiet façade?

A side of the house that enables residents:

- to sleep with their window open ….
- to enjoy (being indoors or outdoors) the outdoor garden or balcony at that façade ….

….without undue disturbance from noise

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Frits

When is a façade quiet?

Least exposed façade sufficiently quiet when:

- noise level preferably < 45 dB Lden;
- noise level < 50 dB Lden;
- no noise peaks at night.

A higher quality of the outdoor area can increase effect.

Lden values imply Lnight < 40 / 45 dB

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Frits

What is an urban quiet area?

A (public) space with a pleasant soundscape:

- where people relax and meet;
- with natural and possibly human sounds and low levels of mechanical sounds;
- fitting the function of the place: enjoy peace and quiet, meet people, sports / exercise, ...;
- that is 'natural', safe and clean.

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Frits

When is an urban area quiet?

When there are pleasant/appropriate sounds.

Noise levels depend on function area, but;

- noise level preferably < 45 dB Lday;
- noise level < 55 dB Lday;

Other qualities should match the quietness.

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Carlo

How can cities create of protect quiet places? Example 1: Amsterdam

- Amsterdam has a big need for new houses
- Even places exposed to high noise levels need to be considered
- To ensure a minimum quality of life Amsterdam has a noise prevention policy

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Carlo

Noise policy Amsterdam

- In the Netherlands we have an extensive system of statutory noise limits...

Dutch Noise limits			
	dB Lden		
Source	Preferance (lower) noise limit *)	(Mandatory) Upper noise limit	In the house
road, traffic	48	53 (highway) 63 (city roads)	33 dB
railway noise	55	68	33 dB
industrial noise	50 dB(A)	55 dB(A)	35 dB(A)

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Carlo

Noise policy Amsterdam

- A quiet side (Lden <48 dB) is required if the facade noise level exceeds the Dutch *preference noise limit*
- This is done by urban planning or by facilities at the houses.
- Deviations on this general rule are possible but the higher the noise exposure the heavier the motivation duty.
- For buildings with a “deaf façade” (a facade with a noise level above the *mandatory upper* noise limit), a quiet side is always obligatory.

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Carlo

Design principles for building in high noise areas

Several levels for influencing the noise level at buildings:

- Building plan: building orientation and shape, noise shields;
- Architectural level: double facade or deaf facade;
- Facilities at the dwelling: loggia's, closed balcony's, noise screens fitted to the building (coulisse screens), absorbing walls;
- Urban planning and traffic measures including the use of noise reducing pavement.

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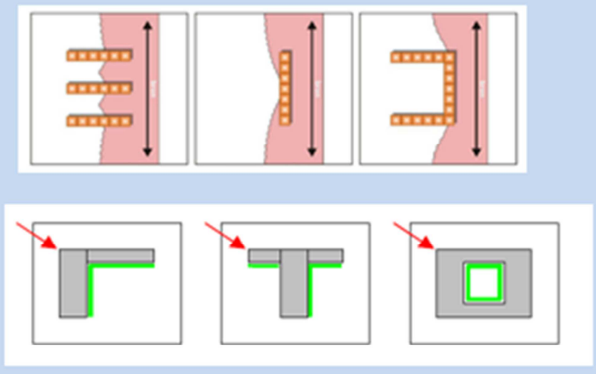
Carlo

Design principles for building in high noise areas

Building orientation and shape-1



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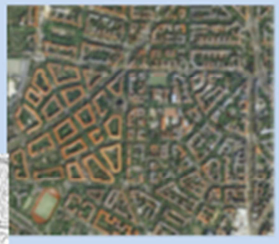
Carlo

Design principles for building in high noise areas

Building orientation and shape-2:

- In Amsterdam and other Dutch cities it was common to build with closed housing blocks (courtyards)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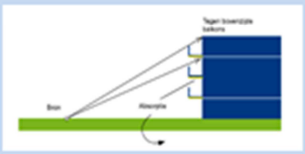
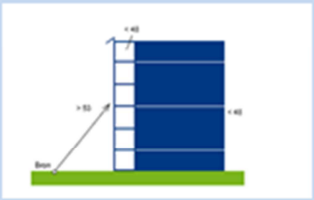
Carlo

Design principles for building in high noise areas

Measures at an architectural level:



Terrace wall



Curtain walls in front of dwellings (double façade)

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Carlo

Examples Amsterdam: Science Park (2008)

Noise screen (railway noise)

Curtain walls
(traffic noise)

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Carlo

Examples Amsterdam: Laan van Spartaan

Motor highway A10

Shielding building parallel to the A10 highway

The building next to the A10 has a curtain wall and partly a deaf facade

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Carlo

Examples Amsterdam: Laan van Spartaan (backside)

Bedrooms at the quiet side

Coulisse screens against car noise

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Carlo

Examples Amsterdam: Haarlemmerhouttuinen

- Combination of a noise shield and (open) curtain walls.

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Martin

How can cities create or protect quiet places?
Example 2: Gothenburg

1. We use "quiet sides":

   In our current noise policy

2. We *will* use quiet sides *and* quiet areas:

   In our new noise policy
   In our new action plan

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Martin

A quiet side = levels at:

- Façade
- Balcony
- Courtyard

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Martin

Current Noise policy

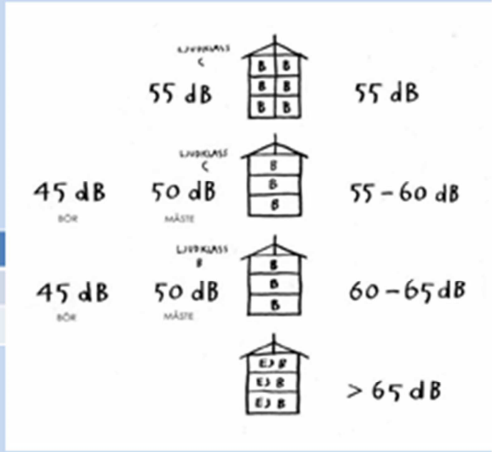
(How to compensate for a "noisy" side)

Access to a quiet side!

→ Level at facade, balcony and courtyards

Low indoor noise

Outdoor	Leq indoors	Lmax indoors
55-60	30 dBA	45 dBA
>60	26 dBA	41 dBA



No dwellings if >65 dBA Leq

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Martin

Current Noise policy

(where compensation can be used)

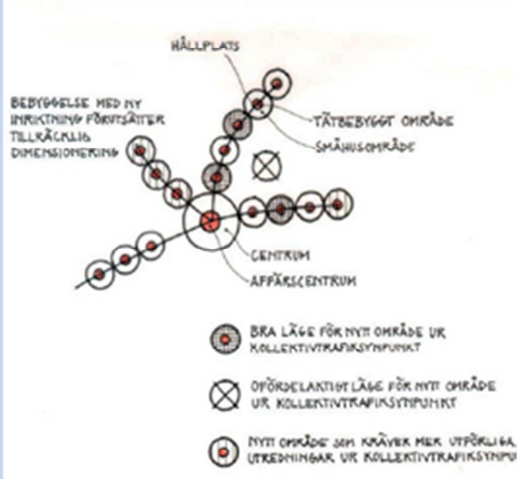
Central parts

(4 km from city centre)

or:

- 500 m to public transport node
- 300 m to "very good" public transport

→ Buildings should be "city-like"



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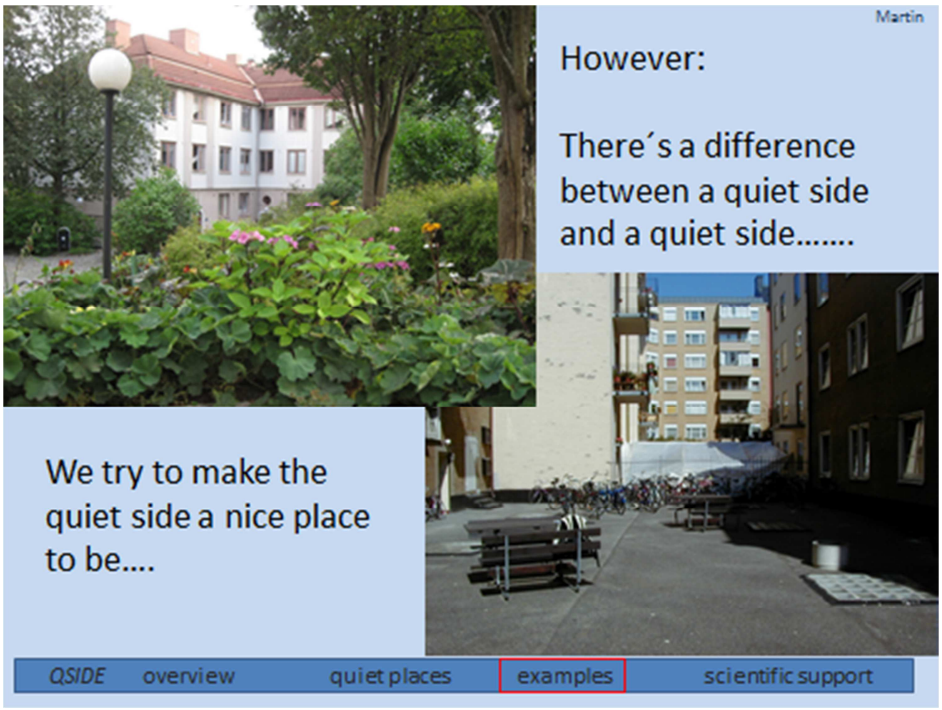
Martin
However:
There´s a difference between a quiet side and a quiet side.....
We try to make the quiet side a nice place to be....
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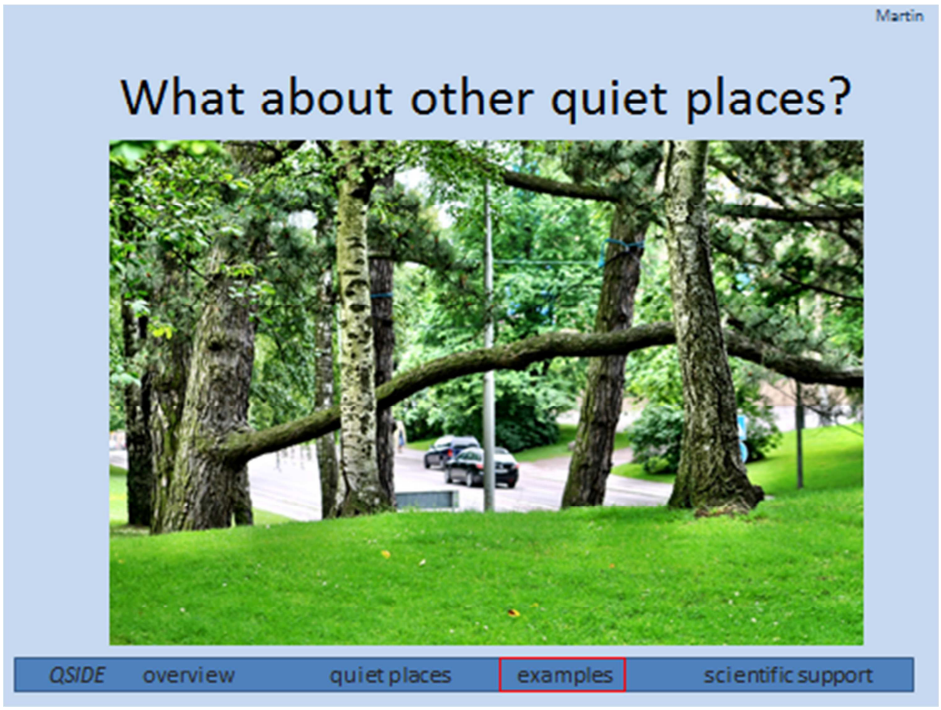
Martin
What about other quiet places?
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Martin

Local Environmental Objective

Nr 12; " A good built environment"

2020

- 90 % of inhabitants below 60 dBA Leq (most exposed facade)
- 95 % of preschools (0-6 years)and schools have access to playground below 55 dBA Leq
- All "city-parks" below 50 dBA Leq on most part of it´s area ("city-park" = big and multifunctional park that attracts all inhabitants)

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Martin

Our new Noise policy

No upper limit

Quiet side and quiet areas for compensation:

- Parks
- Preschools/Schools
- Neighbourhood blocks etc.

We have just not decided how yet.....

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Martin

Our new Action plan

Strategy; create and protect important quiet places;

Preschools

- Identifies the ones that need measures to reach the objective
- Estimates the costs of measures
- Presents a way of working

Parks

- Identifies parks which need actions
- Presents a way of working

Quiet sides

- Keeps fan noise down where traffic noise is high on the other side

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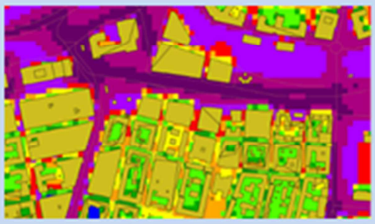
Mikael

Scientific results
Noise model for shielded locations

Mikael - 10 minutes



Traditional noise mapping software usually predict levels at exposed facades in urban streets accurately

[Press <space> or left click to advance presentation]

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Mikael

Quiet areas – poor accuracy

More complex
- Diffraction model
- Multiple refl./diffr.
- Diffuse reflection
- Weather
- Refraction on all ray paths

Less complex
- Not all rays, all energy
- Weather
- Safe transitions to flat landscape
- Trimming parameters using database of complex calculations

Mikael

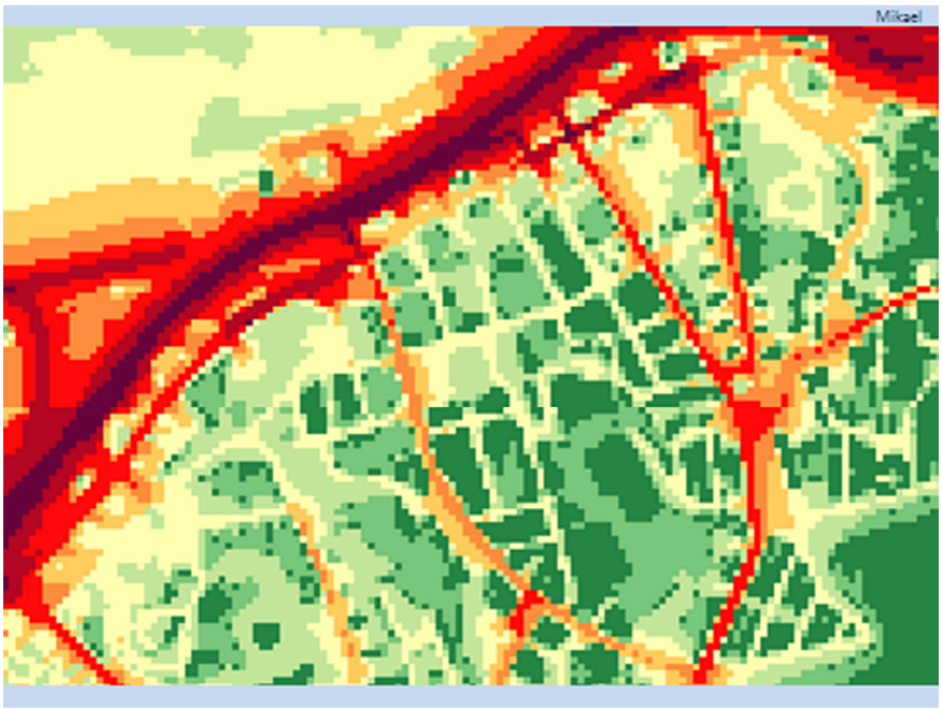
QSIDE model

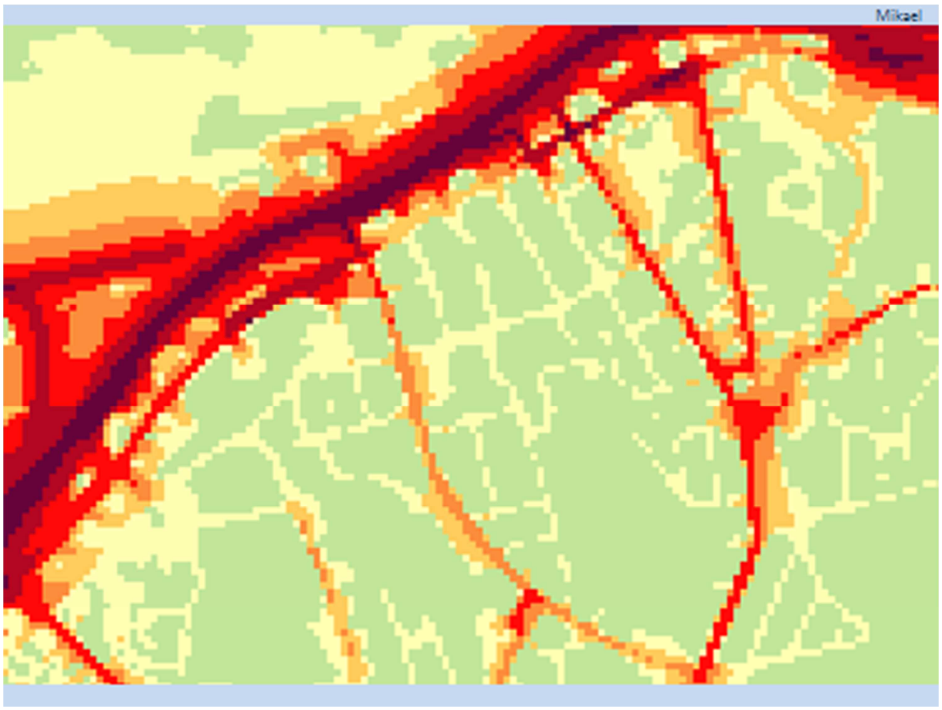
- Starting from house as wide barrier
- Corrections
- Parameters determined by fitting against database of simulations

$$A'_{bar,0} = -10\log_{10}\left|\frac{P_{diffr}}{P_{free}}\right|^2 = -10\log_{10}\left(\left[f^2(Y_s)+g^2(Y_s)\right]\left[f^2(BY_r)+g^2(BY_r)\right]\right)$$

$$A'_{can} = C_1 10\log_{10}\left\{C_2\frac{H_s+H_r+1}{H_i}\left[\frac{0.4}{X'_1+0.4}\right]^4\left[\frac{0.4}{X'_2+0.4}\right]^{C_3}\right\}$$

$$A_{bar,roof} = q_0 A'_{bar} + q_1$$


Mikael

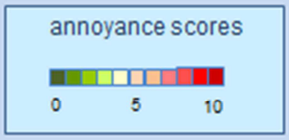

Mikael

Erik

Scientific results
Human response model

Final model soon available

Based on five surveys
- Sweden (N=956, 111)
- Belgium (N=675, 100)
- The Netherlands (N=2000)



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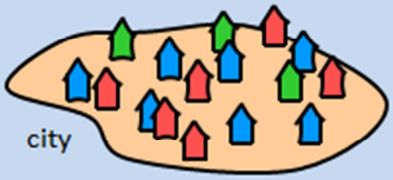
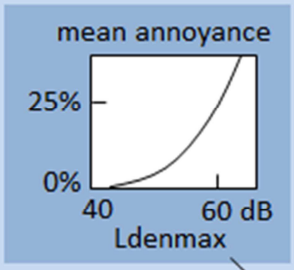
Erik

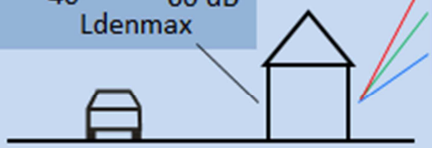
Scientific results
Human response model





QSIDE: annoyance correction

Ldenmin high	positive
Ldenmin average	zero
Ldenmin low	negative

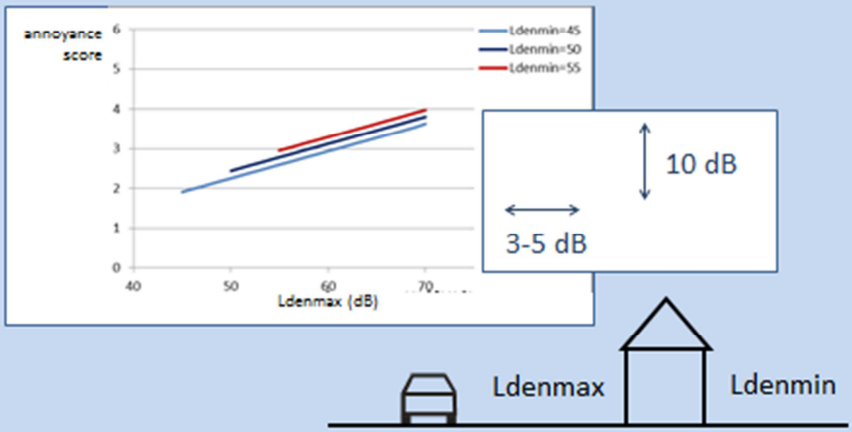


Often: Ldenmin $\lesssim$ 50 dB (with current noise models)

QSIDE overview quiet places examples scientific support

Erik

Scientific results
Human response model

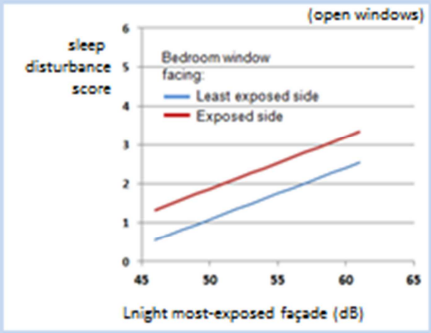


QSIDE overview quiet places examples scientific support

Erik

Scientific results
Human response model

sleeping at quiet side helps!



QSIDE overview quiet places examples scientific support

Related projects

QUADMAP – 10 minutes

HARMONICA – 10 minutes

HUSH – 10 minutes

QSIDE

Discussions - 60 minutes (1)

1. QSIDE proposal for quiet façades
45-50 dB, other qualities, avoid direct exposure at the QF

2. QSIDE proposal for quiet areas
45-55 dB, other qualities

3. QSIDE and END
QSIDE noise model useful extension of noise-mapping models?

4. Related projects
Relations between QSIDE, QUADMAP, HARMONICA, HUSH?

QSIDE

Discussions - 60 minutes (2)

More discussion topics

5. Night Noise Guidelines (WHO)

WHO Night Noise Guidelines 2009

40 dB Lnight at *exposed* façade
sleep disturbance starts at 32 dB Lmax, inside

most or least?

QSIDE

45-50 dB Lden (~ 35-45 dB Lnight) at *least-exposed* façade
avoid direct exposure at the QF

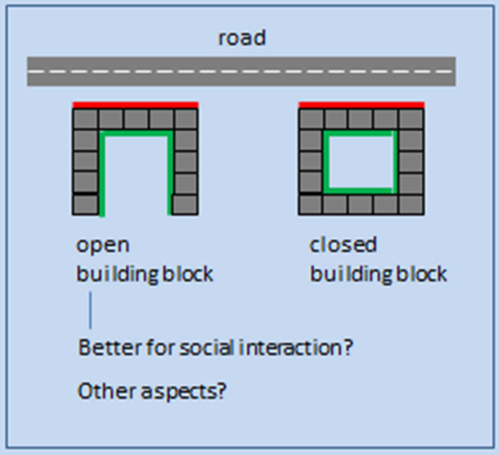
QSIDE

Discussions - 60 minutes (3)

More discussion topics

6. Building blocks

Non-acoustic aspects



QSIDE

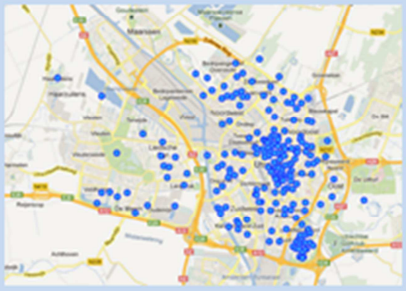
Discussions - 60 minutes (4)

More discussion topics

7. The size of a quiet area

Focus on parks, urban quarters.
Courtyards too small.

DEFRA (UK), criteriafor quiet areas:
- noise level
- minimum area, e.g. 9 hectare



130 potential quiet areas in Utrecht (NL)
(from noise map)

QSIDE

Appendix B: HARMONICA presentation

Presented by Vincent Gissinger (Acoucité, Lyon) at the QSIDE workshop.

HARMONICA

HARMOnised Noise Information for Citizens and Authorities

Coordinator: BRUITPARIF

Beneficiary: ACOUCITE

Total budget: 1.733.608 €

EU contribution: 866.804 € (50%)

Duration: 36 months (10/01/11 - 09/30/14)

Main objectives

Increase the assimilation of the noise issue by the general public and local public authorities and improve information on noise pollution in Europe

- To harmonise methods and means to compare the evolution in time of noise and on different territories and to evaluate noise abatement actions
- To make this information understandable
- To facilitate access to the information about environmental noise and noise abatement actions by the general public and public authorities

Operational objectives

- **To harmonise** the technical aspects of the use of noise monitoring systems and to prepare the transfer of information to other European agglomerations.
- To build **innovative** tools to publish information on environmental noise in an **easy-to-understand** way and to access:
  - a common noise index, CNI
  - an interactive platform to display the index
  - a database on noise abatement actions.
- **To implement** these tools and **assess** them by the general public and public authorities on the two territories
- **To disseminate** this new approach and tools and to share experiences with other European agglomerations.

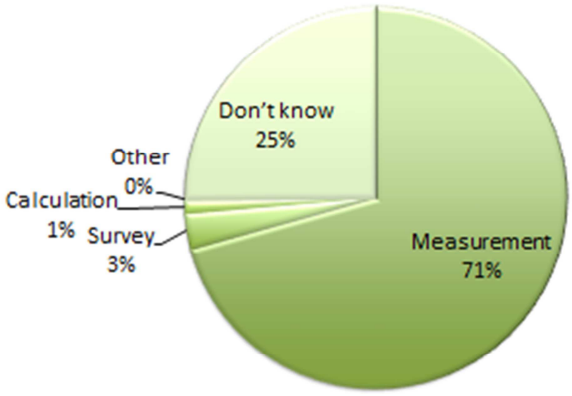
www.noiseineu.com

General survey in 2012

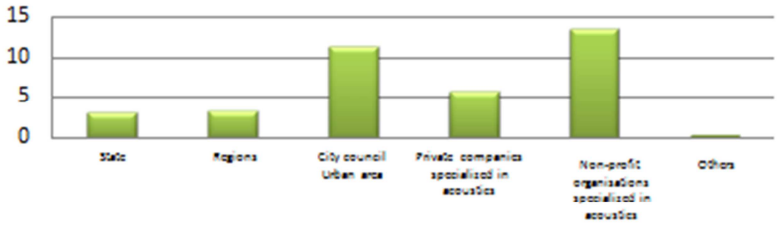
- **Knowledge and expectations of the population about its sound environnement and noise**
- **Same survey will take place in 2014 in order to compare results**

First results (phone, N=800)

In your opinions, what are the methods used by experts to assess noise?



Who do you trust the most to inform you about sound environment?

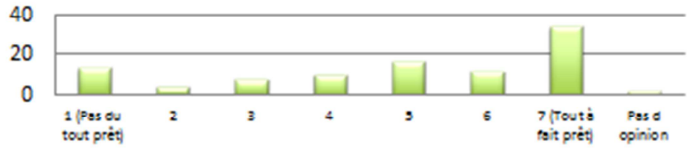


What should we do to make an environment quieter?

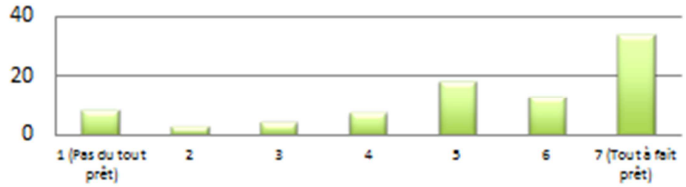
	Grand Lyon	Région IDF	Total
Regulatory actions (prohibition, urban toll, pedestrian streets, controls)	35,3	35,4	35,3
Actions on sources (electric vehicles, speed)	26,5	29,2	27,8
Protection measures (walls, insulation)	35,8	37,2	36,5
Awareness and education actions	12,3	14,5	13,4

I'll give you a list of actions to reduce noise. For each of them tell me to what extent you are willing to adopt it.

Prohibit the city centers for individual vehicles



Change your travel habits



inter noise
2013 | INNSBRUCK | AUSTRIA
15.-18. SEPTEMBER 2013
NOISE CONTROL FOR QUALITY OF LIFE

How to characterize environmental noise closer to people's expectations

Bruno Vincent, PhD, Vincent Gissinger, Julie Vallet, Fanny Mietlicky, Sébastien Carra, Céline Anselme

[1-2-3-5] Acoucité, 24 rue Saint Michel, 69007, Lyon, France
[2] Grand Lyon, 15 rue du Lac, 69003, France
[4] Bruitparif, 9 impasse Milord, 75018 Paris, France

Building of the common noise index

- 4 new proposals on test
- Comparison with Laeq
- Field and laboratory assesments

Assesment protocol of the indexes

T 1 **On-site surveys with inhabitants**

8 sites,
240 respondents

→ 8 permanent sound level meters Laeq(1s)
→ 8 audio recorders to represent the atmosphere of the selected sites+ photo report
→ 8 x 30 surveys: 240

T 2 **Laboratory surveys with three different groups**

120 respondents

→ 40 people from general public
→ 40 experts
→ 40 representatives from local authorities and associations
→ 4 + 4 High-quality Audio Playbacks (audio conform)

April 2013: Analys of results and choice of the index

inter noise 2013 | INNSBRUCK | AUSTRIA
15.-18. SEPTEMBER 2013
NOISE CONTROL FOR QUALITY OF LIFE

At the heart of Harmonica project: the Common Noise Index (CNI)

C. Ribeiro, C. Anselme, F. Mietlicki, B. Vincent

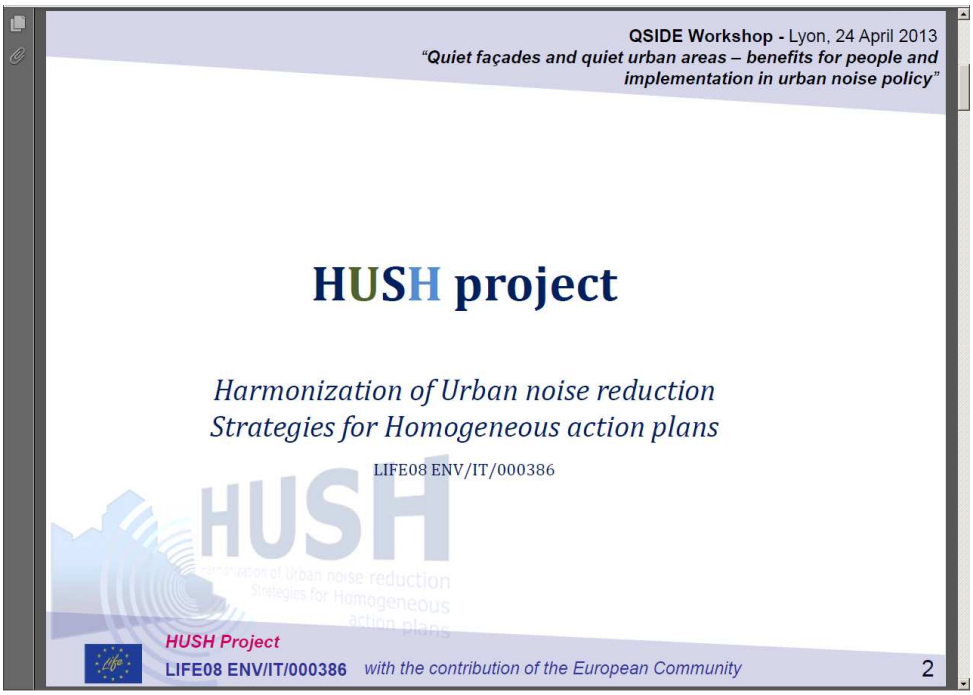
Thank you for your attention!

http://www.harmonica-project.eu/en

- *Common noise index*
  - **Proposition of indexes, Action 3**
    Carlos Ribeiro, Head of studies department of Bruitparif
    Carlos.Ribeiro@bruitparif.fr
  - **Survey campaign to assess indexes, Action 4**
    Bruno Vincent, Director of Acoucité
    Bruno.Vincent@acoucite.org
- *General overview of the Harmonica project*
  Piotr Gaudibert, project manager
  Piotr.Gaudibert@Bruitparif.fr

Appendix C: HUSH and QUADMAP presentations

Presented by Francesco Borchi (University of Firenze) at the QSIDE workshop.




QSIDE Workshop - Lyon, 24 April 2013
"Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
Coordinating Beneficiary:
Comune di Firenze - Direzione Ambiente
Associated Beneficiary:
VIE EN.RO.SE. Ingegneria srl
Università degli Studi di Firenze, Dipartimento di Ingegneria Industriale
ARPAT - Agenzia Regionale per la Protezione Ambientale della Toscana
ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale
HUSH Project
LIFE08 ENV/IT/000386 with the contribution of the European Community
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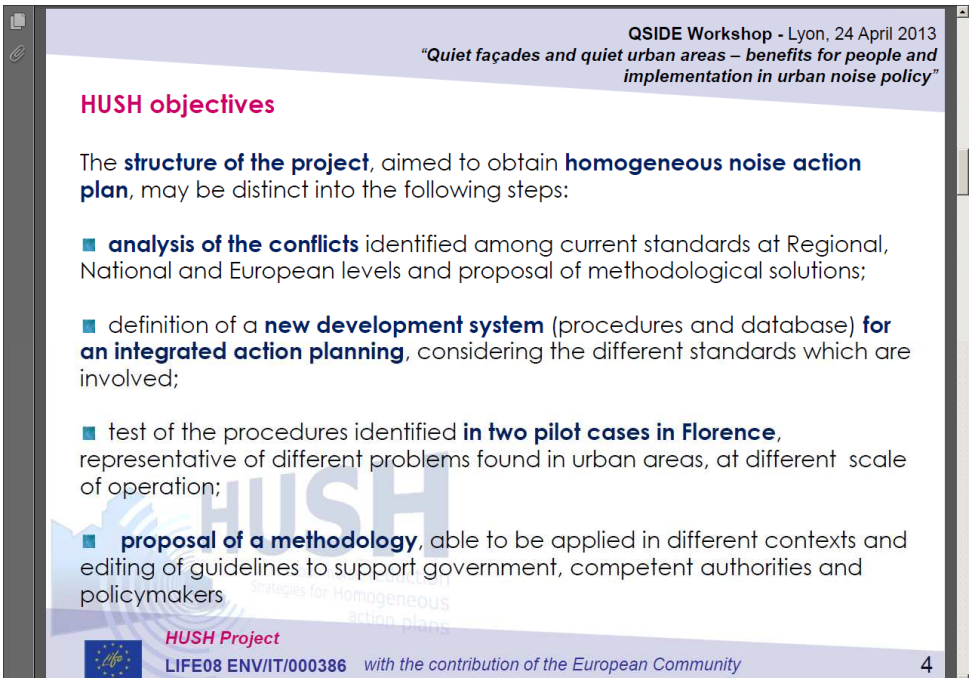
QSIDE Workshop - Lyon, 24 April 2013
"Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
HUSH objectives
The structure of the project, aimed to obtain homogeneous noise action plan, may be distinct into the following steps:
analysis of the conflicts identified among current standards at Regional, National and European levels and proposal of methodological solutions;
definition of a new development system (procedures and database) for an integrated action planning, considering the different standards which are involved;
test of the procedures identified in two pilot cases in Florence, representative of different problems found in urban areas, at different scale of operation;
proposal of a methodology, able to be applied in different contexts and editing of guidelines to support government, competent authorities and policymakers
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HUSH Results

- **Analysis of legislations has been carried on and conflicts have been detected**
- **Definition of methodological solutions for an harmonized Action Plan**
- **Interventions in pilot areas**
- **Proposal for revision on national legislation and Environmental Noise Directive**

The main issues, listed below, will be briefly described in this presentation, such as the proposed methodological solutions :

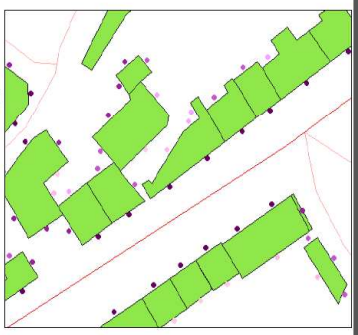
- **Noise maps for action planning**
- **Hotspots definition and assessment**
- **Quiet Areas definition and assessment**
- **Areas of intervention**
- **Participatory design**

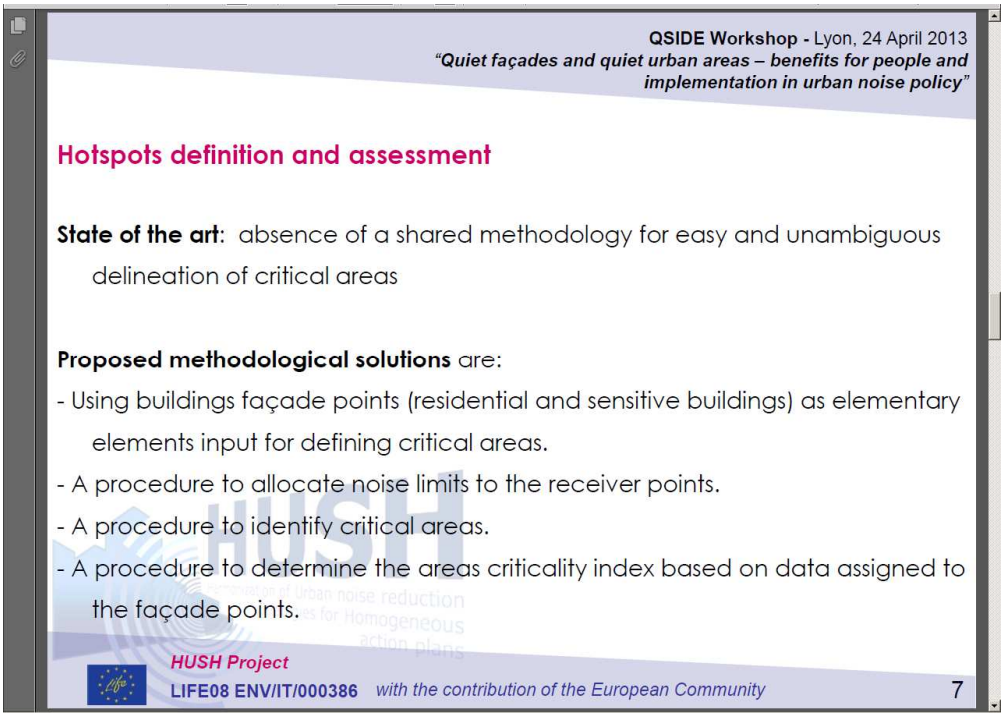
Noise maps for action planning

State of the art: difficulty of overlaying and comparing noise maps produced by responsible of different infrastructures

Proposed methodological solutions are:

- To use a common approach GPG based;
- To have only one responsible of noise mapping for all sources or to have many responsible of noise mapping using the same geographical database and the same output calculation points according with action planning procedures, too;
- To realise noise maps with both, EU indicators and National ones.




QSIDE Workshop - Lyon, 24 April 2013
"Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
Hotspots definition and assessment
State of the art: absence of a shared methodology for easy and unambiguous delineation of critical areas
Proposed methodological solutions are:
- Using buildings façade points (residential and sensitive buildings) as elementary elements input for defining critical areas.
- A procedure to allocate noise limits to the receiver points.
- A procedure to identify critical areas.
- A procedure to determine the areas criticality index based on data assigned to the façade points.
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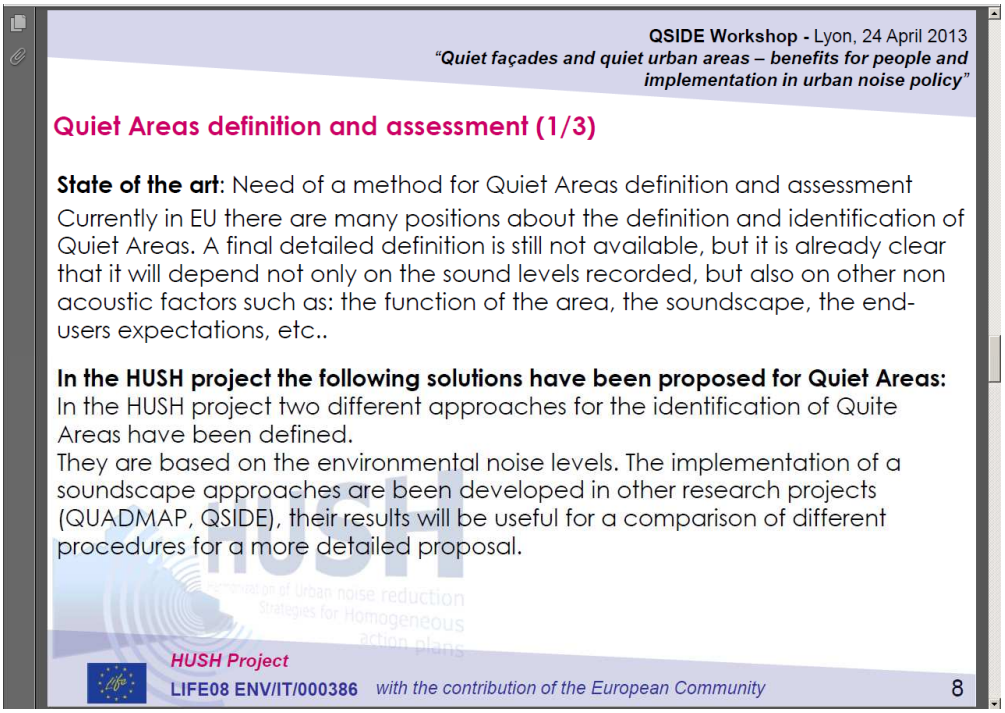
QSIDE Workshop - Lyon, 24 April 2013
"Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
Quiet Areas definition and assessment (1/3)
State of the art: Need of a method for Quiet Areas definition and assessment
Currently in EU there are many positions about the definition and identification of Quiet Areas. A final detailed definition is still not available, but it is already clear that it will depend not only on the sound levels recorded, but also on other non acoustic factors such as: the function of the area, the soundscape, the end-users expectations, etc..
In the HUSH project the following solutions have been proposed for Quiet Areas:
In the HUSH project two different approaches for the identification of Quite Areas have been defined.
They are based on the environmental noise levels. The implementation of a soundscape approaches are been developed in other research projects (QUADMAP, QSIDE), their results will be useful for a comparison of different procedures for a more detailed proposal.
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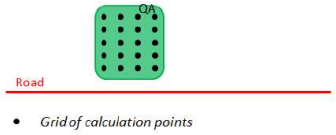
Quiet Areas definition and assessment (2/3)

The **first approach** is linked to parameters and limits defined at National level and based on the noise zoning defined by the municipalities. Exceedances are valued similarly to critical areas. It is also defined a priority index in a similar way that for Hotspots with the aim of being able to compare and add the index values of Hotspots and Quiet Areas. In this way, it will be possible to assess an overall priority index for areas that include criticalities of both Hotspots and Quiet Areas.

The following criterion has been proposed:
LAeq(06-22) < noise limits enstablished by noise zoning



- *Grid of calculation points*

Information needed
Geographical data, noise levels from noise mapping process (based on the calculation of noise levels on a grid of points, at least 10 m x 10 m spaced) with Italian (LAeq(06:00-22:00) equivalent noise level in the day time, acoustics zoning of all the municipalities in the agglomeration.

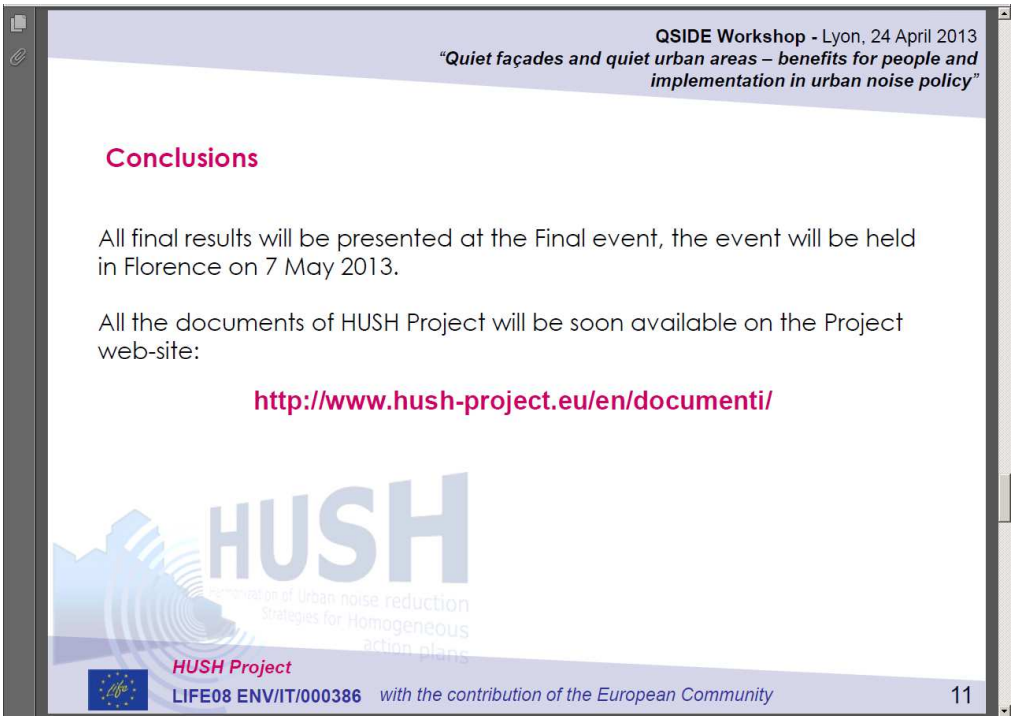
Quiet Areas definition and assessment (3/3)

The **second approach** refers to EU noise indicator, according to the Directive indications, based on the fact that National requirements are not established for Quiet Areas. This approach has been proposed by the partner ARPAT during the reviewing phase of Regional regulation of Tuscany and it is under discussion by the Regional authority.

For Quiet Areas inside urban zones the following rules has been proposed:
Lday < 55 dBA
NA70 < 12
Area Extension > 1000 m2

For Quiet Areas outside urban zones the following rules has been proposed:
Lday < 50 dBA
NA70 < 12
Distance from main sources > 300 m

Information needed
Geographical data, noise levels from noise mapping process with European indicators (Lday), and the value of NA70 for noise from railway and aircraft overflight.


QSIDE Workshop - Lyon, 24 April 2013
"Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
Conclusions
All final results will be presented at the Final event, the event will be held in Florence on 7 May 2013.
All the documents of HUSH Project will be soon available on the Project web-site:
http://www.hush-project.eu/en/documenti/
HUSH
HUSH Project
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Tuesday 7 May 2013 – h 9.30 – 17.30 – Florence
Palazzo Vecchio – Sala de' Dugento
FINAL CONFERENCE
"The contribute of HUSH project in harmonizing urban noise reduction strategies for homogeneous action plans"
09.00 REGISTRATION OF PARTICIPANTS
09.30 Introduction and Welcome by Authorities
Mayor or Florence
EU DG Environment Representative
Italian Ministry of Environment Representative
Tuscan Region Ministry of Environment Representative
10.00 Presentation of HUSH PROJECT and main results, by the Project Manager – Arnaldo Melloni
10.15 The HUSH framework, ideas and solutions, by the Project Technical Manager - Sergio Luzzi
10.30 The HUSH methodological approach and system implementation and optimization – Francesco Borchi – Dipartimento di Ingegneria Industriale, Università degli Studi di Firenze (UNIFI)
10.45 Participatory design of noise reduction measurement - Raffaella Bellomini - VIE EN.RO.SE. Ingegneria srl
11.00 Study of pilot cases: realization of the interventions and ante/post operam analysis of the acoustics data – David Casini - ARPAT
11.15 Pilot cases management: realization of acoustics interventions and analysis of ante/post operam non acoustics data – Arnaldo Melloni – Comune di Firenze
11.30 National and regional noise legislation: conflicts and a proposal for their solution in Tuscany Region – Gaetano Licitra - ARPAT
11.45 Conflicts analysis among European, National and Regional legislation. Proposal for revision of Italian Legislation and END Directive – Rosalba Silvaggio- ISPRA
12.00 Keynote Lecture: European Policies regarding Noise Assessment – European Commission - DG Environment
12.30 Discussion
13.00 LUNCH
FINAL ROUND TABLE
Networking and Further Development
14.30 Expectations and plans for further development of HUSH and other LIFE projects network activities
LIFE09 ENV/IT/000102 NADIA – Francesco Asdrubali - CIRIAF
LIFE10 ENV/IT/000407 QUADMAP – Monica Carfagni - UNIFI
LIFE10 ENV/FR/000211 HARMONICA – Piotr Gaudibert - BRUITPARIF
15.30 Revision of Regional, National, European Legislation: HUSH contribution, impact and expectations
EU DG ENVIRONMENT – EUROPEAN ENVIRONMENTAL AGENCY
ITALIAN MINISTRY OF ENVIRONMENT - ISPRA
TUSCAN REGION ENVIRONMENT MINISTRY – ARPAT
17.00 CLOSING
organized by
COMUNE DI FIRENZE
"LIFE is the EU's financial instrument supporting environmental and nature conservation projects throughout the EU, as well as in some candidate, acceding and neighboring countries.
Since 1992, LIFE has co-financed some 3708 projects, contributing approximately € 2.8 billion to the protection of the environment."
Coordinating Beneficiary:
Comune di Firenze - Direzione Ambiente
Associated Beneficiaries:
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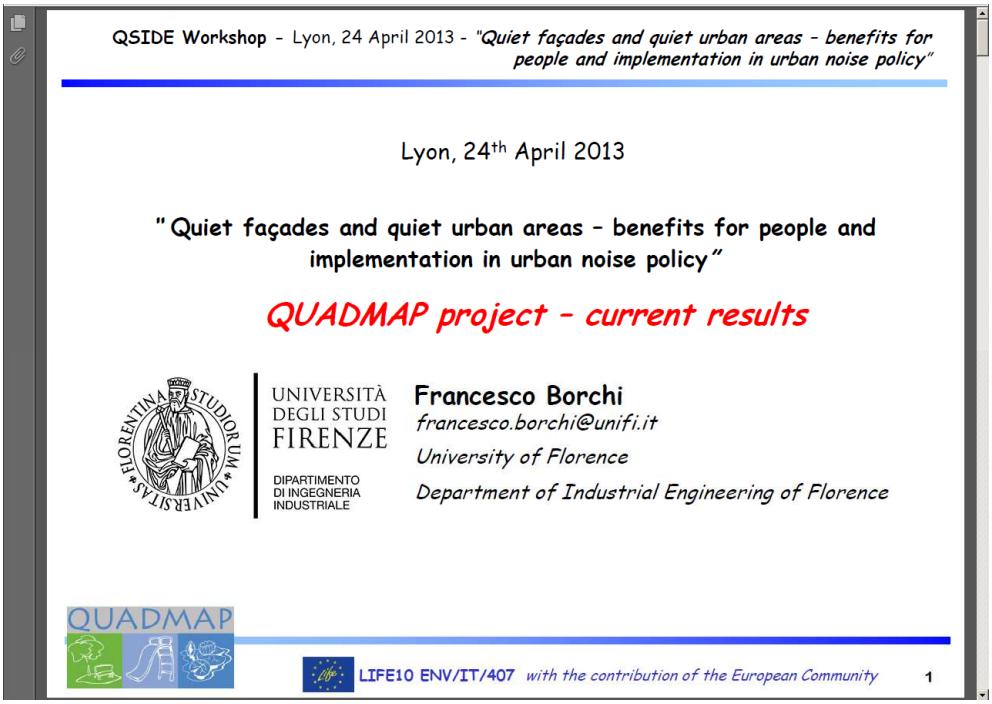
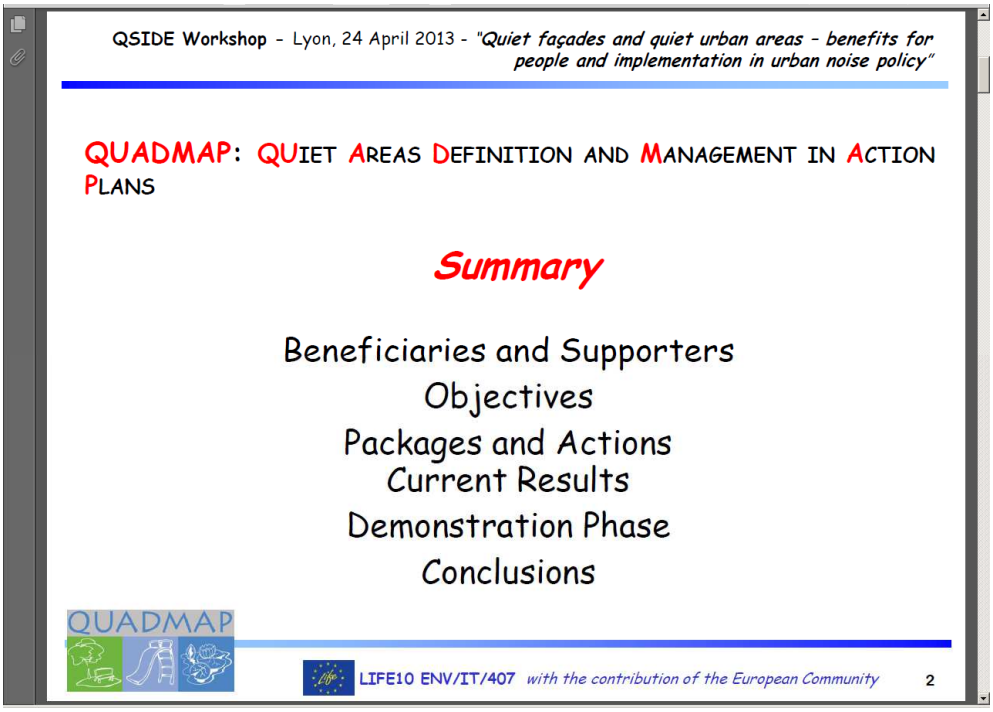
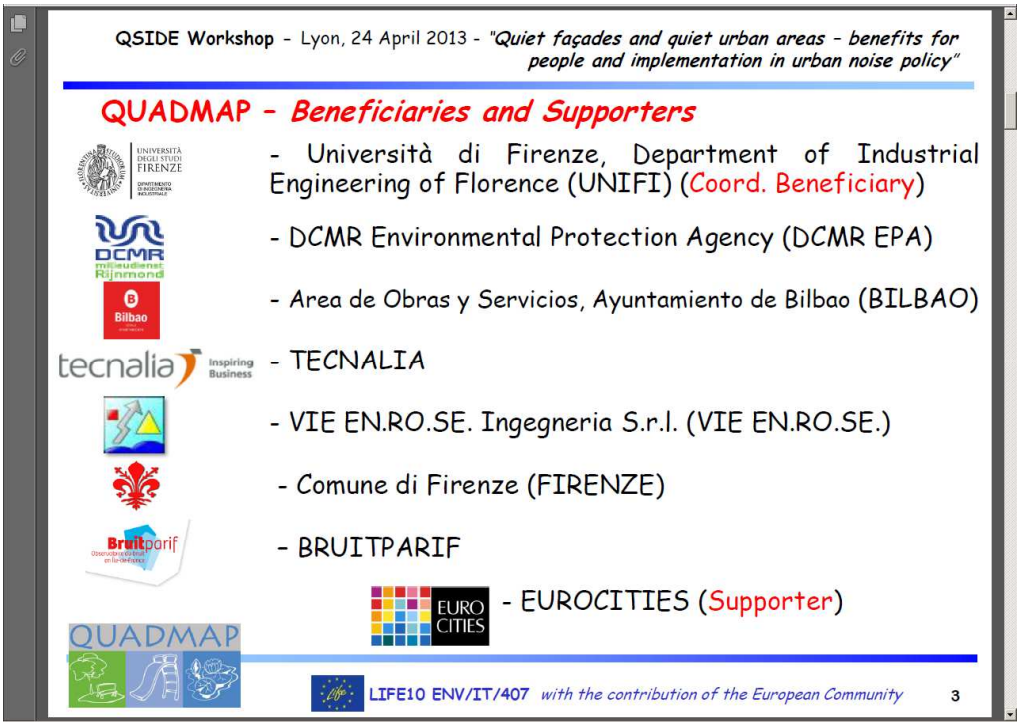
Università degli Studi di Firenze, Dipartimento di Ingegneria Industriale
ARPAT - Agenzia Regionale per la Protezione Ambientale della Toscana
ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale
Life
With the contribution of the LIFE financial instrument of the European Community
HUSH project
Harmonization of Urban noise reduction Strategies for Homogeneous action plans
LIFE08 ENV/IT/000386
Final Event
FLORENCE 7 May 2013
Palazzo Vecchio - Sala De' Dugento


QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas - benefits for people and implementation in urban noise policy"
Lyon, 24th April 2013
" Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
QUADMAP project – current results
UNIVERSITÀ DEGLI STUDI FIRENZE
DIPARTIMENTO DI INGEGNERIA INDUSTRIALE
Francesco Borchi
francesco.borchi@unifi.it
University of Florence
Department of Industrial Engineering of Florence
QUADMAP
LIFE10 ENV/IT/407 with the contribution of the European Community
1


QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas - benefits for people and implementation in urban noise policy"
QUADMAP: QUIET AREAS DEFINITION AND MANAGEMENT IN ACTION PLANS
Summary
Beneficiaries and Supporters
Objectives
Packages and Actions
Current Results
Demonstration Phase
Conclusions
QUADMAP
LIFE10 ENV/IT/407 with the contribution of the European Community
2


QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas - benefits for people and implementation in urban noise policy"
QUADMAP - Beneficiaries and Supporters
- Università di Firenze, Department of Industrial Engineering of Florence (UNIFI) (Coord. Beneficiary)
- DCMR Environmental Protection Agency (DCMR EPA)
- Area de Obras y Servicios, Ayuntamiento de Bilbao (BILBAO)
- TECNALIA
- VIE EN.RO.SE. Ingegneria S.r.l. (VIE EN.RO.SE.)
- Comune di Firenze (FIRENZE)
- BRUITPARIF
- EUROCITIES (Supporter)
QUADMAP
LIFE10 ENV/IT/407 with the contribution of the European Community
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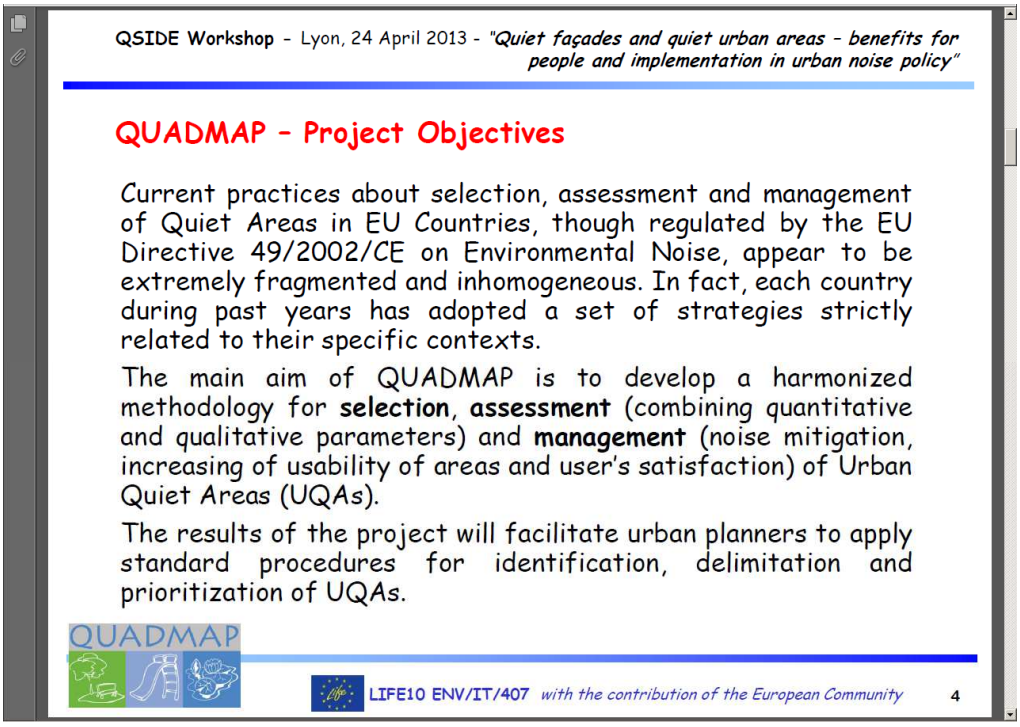
QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas - benefits for people and implementation in urban noise policy"
QUADMAP - Project Objectives
Current practices about selection, assessment and management of Quiet Areas in EU Countries, though regulated by the EU Directive 49/2002/CE on Environmental Noise, appear to be extremely fragmented and inhomogeneous. In fact, each country during past years has adopted a set of strategies strictly related to their specific contexts.
The main aim of QUADMAP is to develop a harmonized methodology for selection, assessment (combining quantitative and qualitative parameters) and management (noise mitigation, increasing of usability of areas and user's satisfaction) of Urban Quiet Areas (UQAs).
The results of the project will facilitate urban planners to apply standard procedures for identification, delimitation and prioritization of UQAs.
QUADMAP
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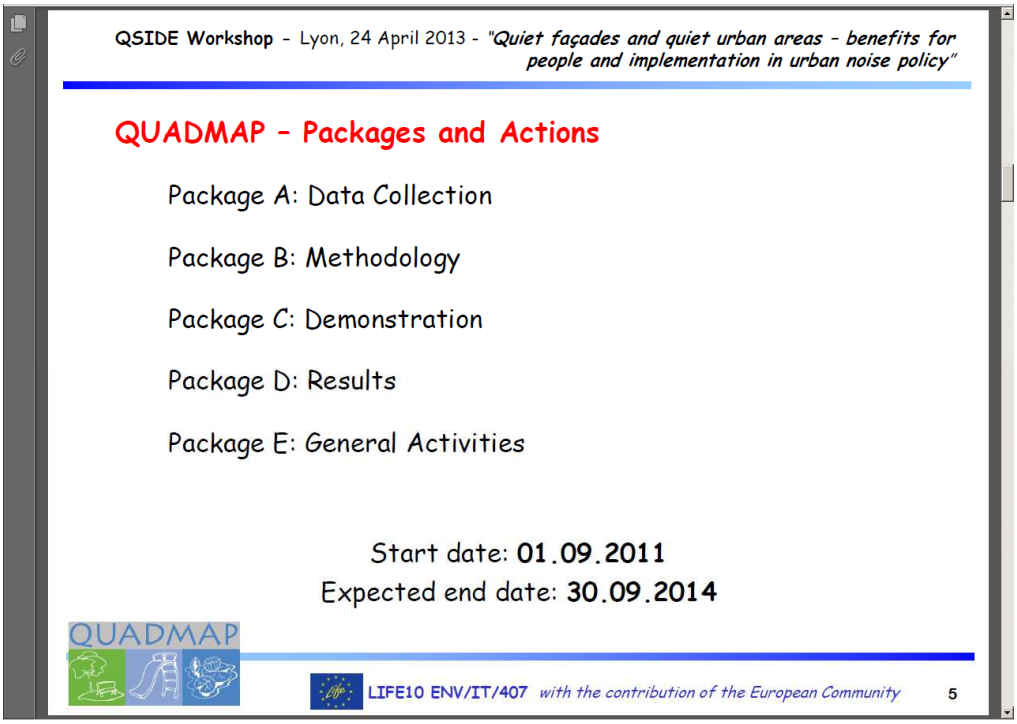
QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
QUADMAP – Packages and Actions
Package A: Data Collection
Package B: Methodology
Package C: Demonstration
Package D: Results
Package E: General Activities
Start date: 01.09.2011
Expected end date: 30.09.2014
QUADMAP
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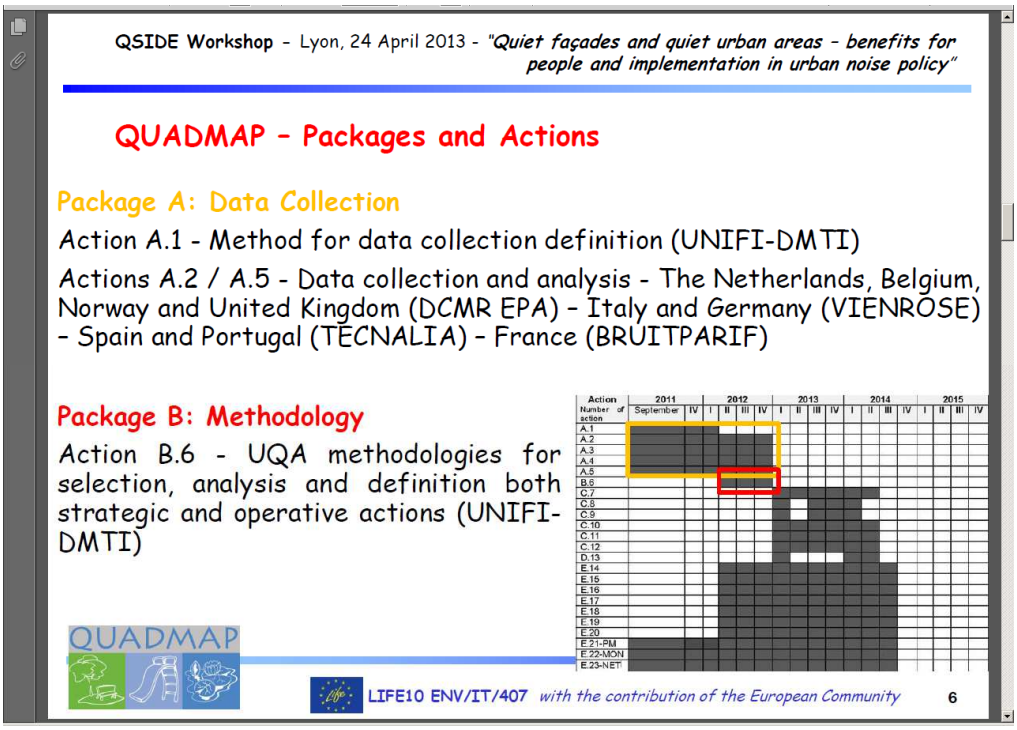
5


QSIDE Workshop - Lyon, 24 April 2013 - "Quiet façades and quiet urban areas – benefits for people and implementation in urban noise policy"
QUADMAP – Packages and Actions
Package A: Data Collection
Action A.1 - Method for data collection definition (UNIFI-DMTI)
Actions A.2 / A.5 - Data collection and analysis - The Netherlands, Belgium, Norway and United Kingdom (DCMR EPA) – Italy and Germany (VIENROSE) – Spain and Portugal (TECNALIA) – France (BRUITPARIF)
Package B: Methodology
Action B.6 - UQA methodologies for selection, analysis and definition both strategic and operative actions (UNIFI-DMTI)
Action
Number of action
2011
2012
2013
2014
2015
September
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Package C: Demonstration

Action C.7 / C.12 - Pilot areas selection, interventions design and accomplishment will be carried out in FIRENZE (*school gardens and squares*), BILBAO (*urban and peri-urban quiet areas*) and in a city of The Netherlands (*quiet areas in the city centre and residential places*)

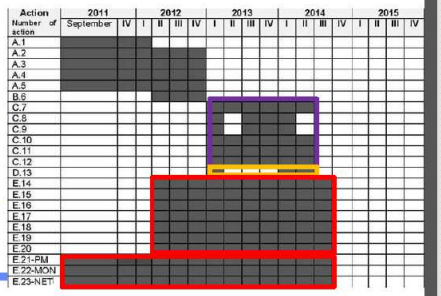
Package D: Results

Action D.13 - Methodology optimization (UNIFI-DMTI)

Package E: General Activities

Actions E.14 / E.20 – Dissemination (all partners will be involved)

Action E.21/22/23 - Project Management /Monitoring/Networking (UNIFI-DMTI)



Current results – The proposed methods

- Introduction
- Description of the proposed methods:
  - STEP 1 - QUAs' definition
  - STEP 2 - candidate QUAs selection
  - STEP 3 - candidate QUAs analysis
  - STEP 4 - QUAs' managing
- Other examined aspects

Introduction 1/2

The proposed methods are chosen according to the **State of the Art** concerning **EU strategies** for selection and analysis of QUAs and also to **stakeholders questionnaires results**.

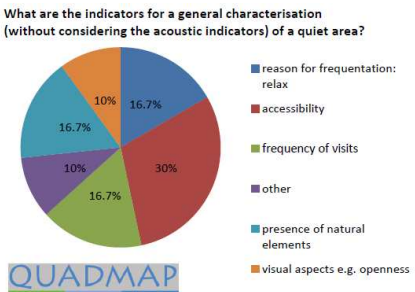
With the further explained methodology an effort has been made in order to **define a set rules which can be accustomed in a general steering document**. Methodologies will be developed in order to leave each Country free to adapt on-the-fields activities.

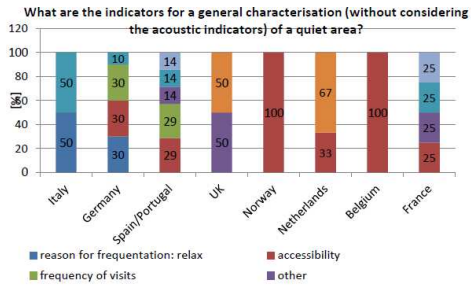
The aim is not to provide rigid sequence of operations, but an effective procedural, logic to be implementable also thanks to **schematic Tools**, despite of peculiarities of each Member state.

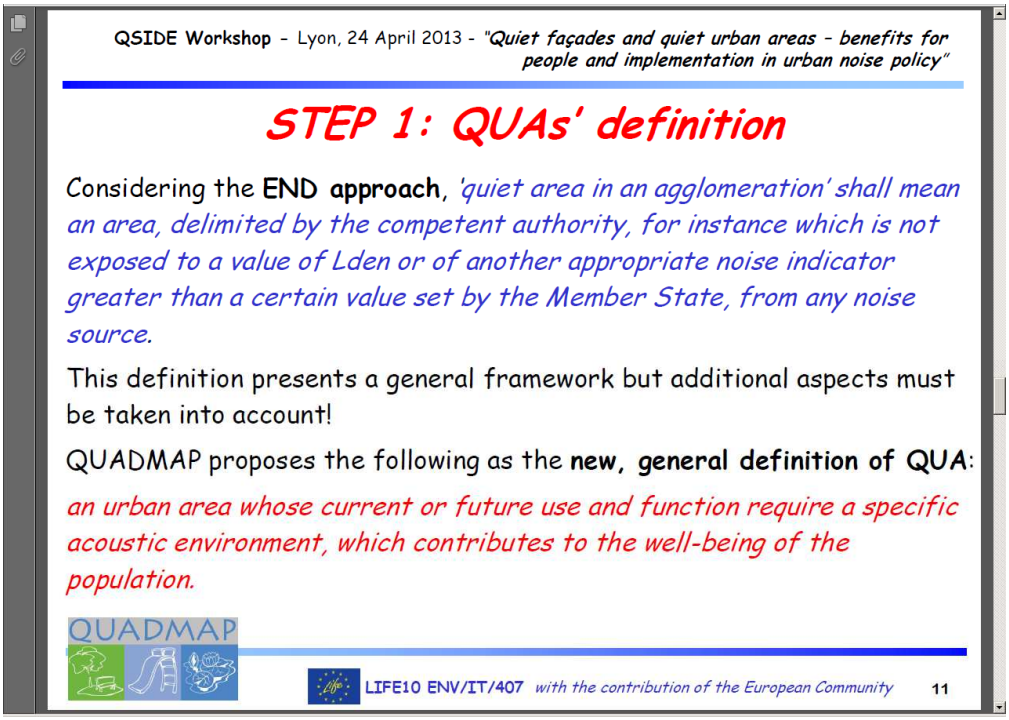
Introduction 2/2

The provisional procedure is based on the analysis of the results of the **State of the Art**, developed in the QUADMAP project. In addition, a **stakeholders' questionnaire** was submitted in several European countries, asking the competent authorities involved in the implementation of the END about the methods used for selecting/analysing/managing QUAs (36 stakeholders filled in the questionnaire).

The following Figures show a summary of the identified indicators.



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STEP 1: QUAs' definition
Considering the END approach, 'quiet area in an agglomeration' shall mean an area, delimited by the competent authority, for instance which is not exposed to a value of Lden or of another appropriate noise indicator greater than a certain value set by the Member State, from any noise source.
This definition presents a general framework but additional aspects must be taken into account!
QUADMAP proposes the following as the new, general definition of QUA:
an urban area whose current or future use and function require a specific acoustic environment, which contributes to the well-being of the population.
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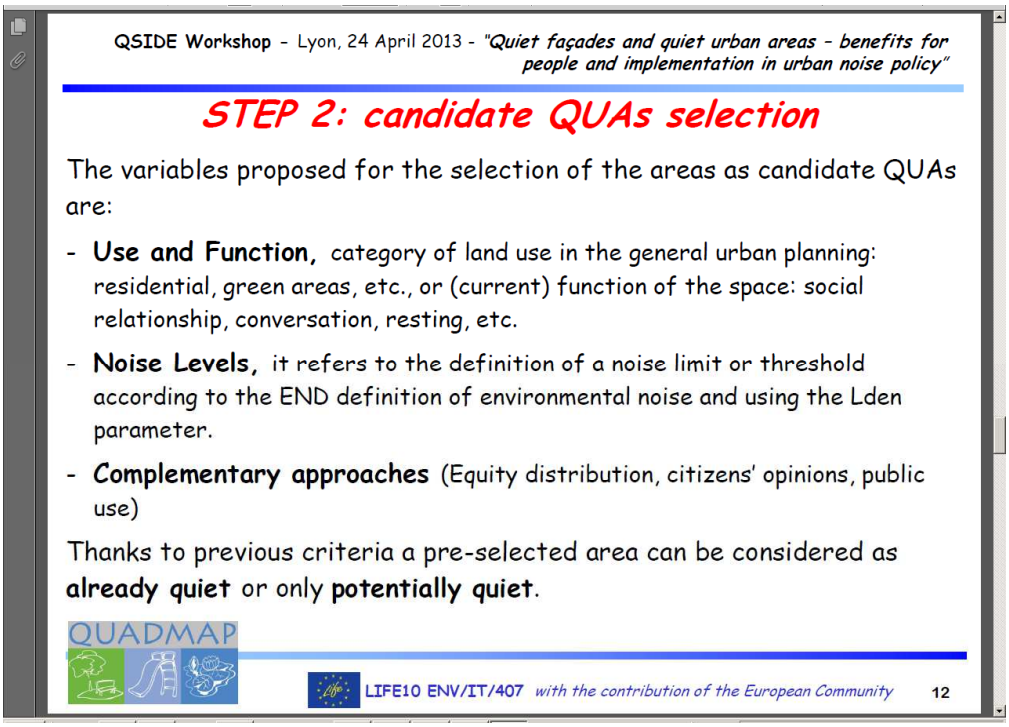
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STEP 2: candidate QUAs selection
The variables proposed for the selection of the areas as candidate QUAs are:
- Use and Function, category of land use in the general urban planning: residential, green areas, etc., or (current) function of the space: social relationship, conversation, resting, etc.
- Noise Levels, it refers to the definition of a noise limit or threshold according to the END definition of environmental noise and using the Lden parameter.
- Complementary approaches (Equity distribution, citizens' opinions, public use)
Thanks to previous criteria a pre-selected area can be considered as already quiet or only potentially quiet.
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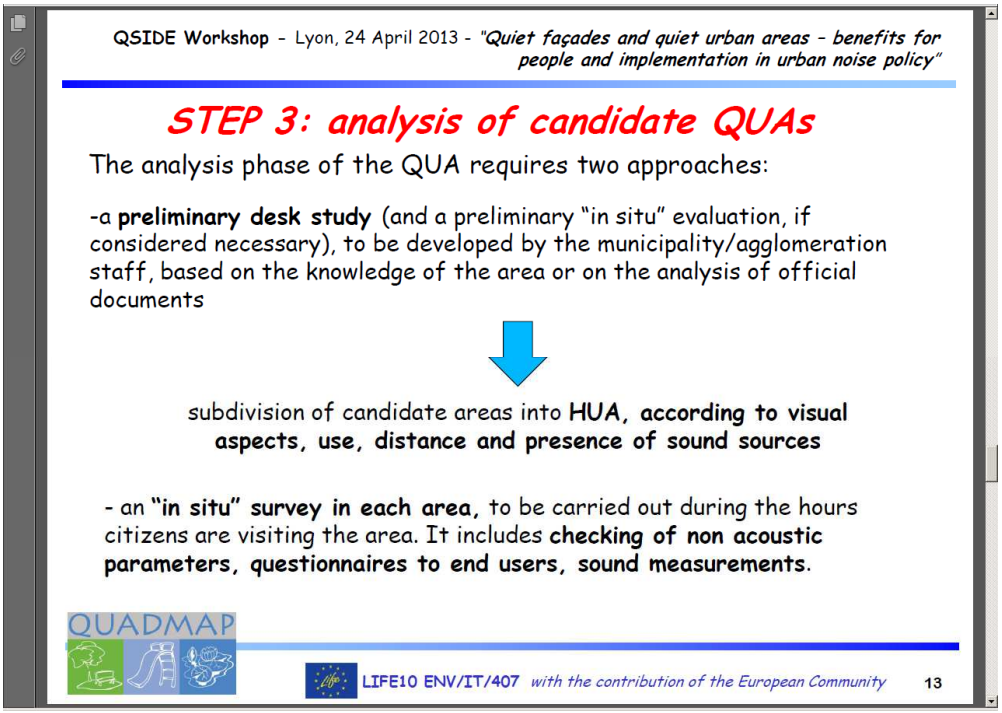
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STEP 3: analysis of candidate QUAs
The analysis phase of the QUA requires two approaches:
-a preliminary desk study (and a preliminary "in situ" evaluation, if considered necessary), to be developed by the municipality/agglomeration staff, based on the knowledge of the area or on the analysis of official documents
subdivision of candidate areas into HUA, according to visual aspects, use, distance and presence of sound sources
- an "in situ" survey in each area, to be carried out during the hours citizens are visiting the area. It includes checking of non acoustic parameters, questionnaires to end users, sound measurements.
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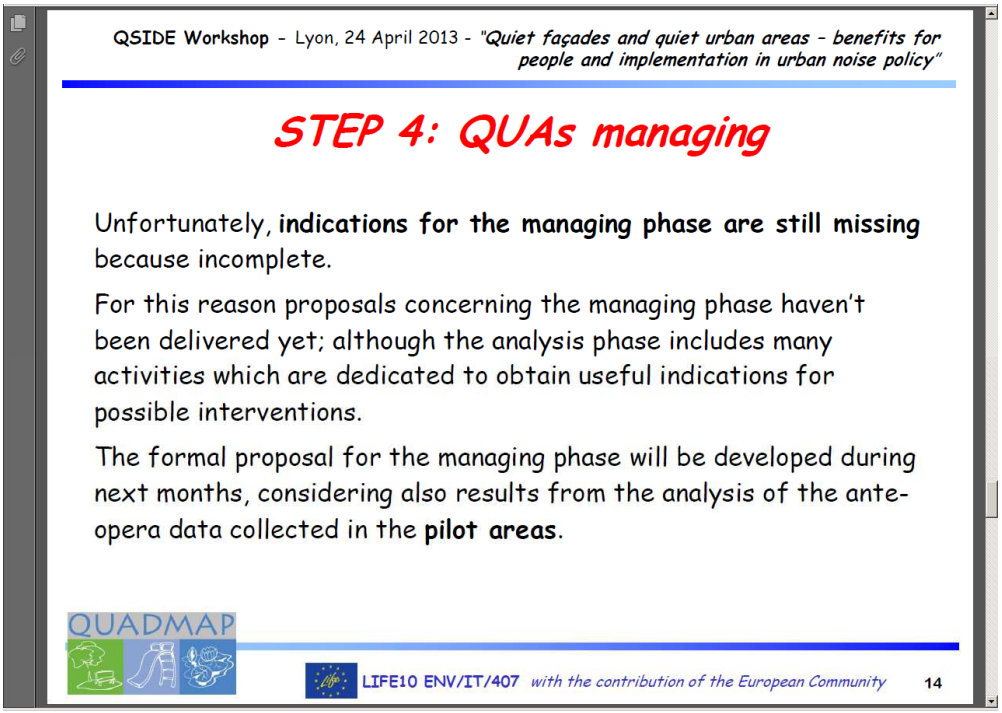
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STEP 4: QUAs managing
Unfortunately, indications for the managing phase are still missing because incomplete.
For this reason proposals concerning the managing phase haven't been delivered yet; although the analysis phase includes many activities which are dedicated to obtain useful indications for possible interventions.
The formal proposal for the managing phase will be developed during next months, considering also results from the analysis of the ante-opera data collected in the pilot areas.
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Other examined aspects

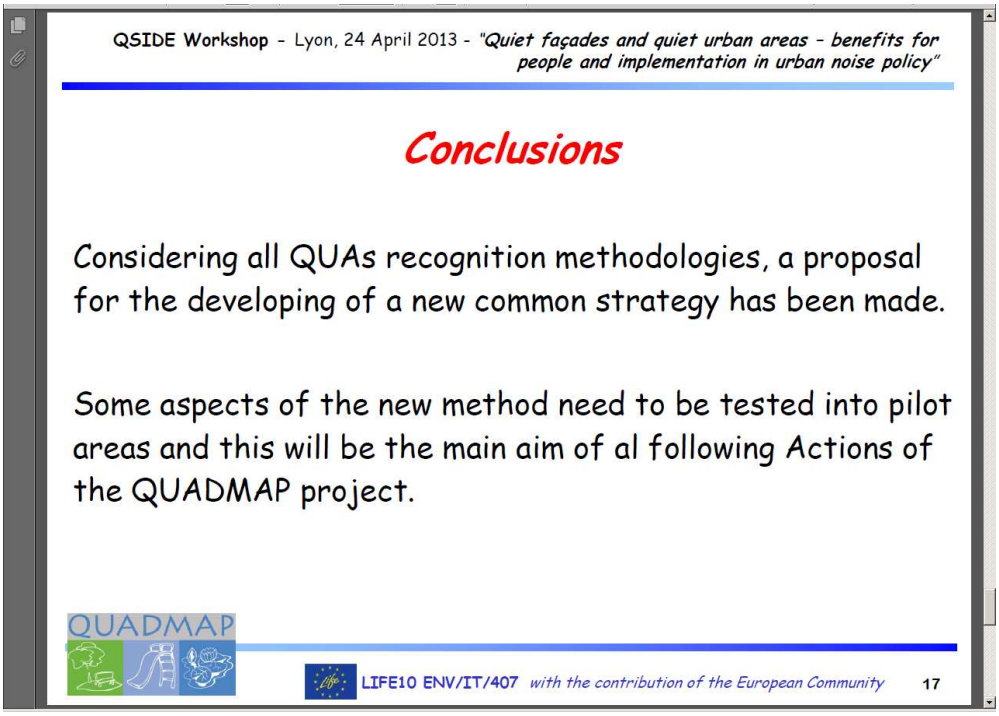
Some specific topics have been defined, although not verified yet:

- Developing of testing methodology
- Expected results from the ante-opera data analysis in pilot areas
- Applicative Tools for Steps 2-4
- Structure of in situ questionnaire for end-users
- Minimal requirements for in situ measurements (short and long term)

Ongoing activities - Demonstration Phase

The project has a high level of demonstrativeness guaranteed by the fact that the methodology will be tested on a number of case study areas. In particular, the proposed methodology will be tested in a set of pilot cases in:

- a city of The Netherlands
- Spain (Bilbao)
- Italy (Firenze)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Conclusions
Considering all QUAs recognition methodologies, a proposal for the developing of a new common strategy has been made.
Some aspects of the new method need to be tested into pilot areas and this will be the main aim of al following Actions of the QUADMAP project.
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francesco.borchi@unifi.it
http://www.quadmap.eu
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