



LIFE Project Number  
**LIFE10 ENV/IT/407**

**FINAL Report**  
**Covering the project activities from 01/09/2011 to 31/03/2015**

Reporting Date  
**June 2015**

LIFE+ QUADMAP  
**Quiet Areas Definition and Management in Action Plans**

Project Data

|   |   |
|---|---|
| <b>Project location</b>                   | Italy, The Netherlands, Spain, France               |
| <b>Project start date:</b>                | 01/09/2011  |
| <b>Project end date:</b>                  | 30/09/2014 <b>Extension date:</b> 31/03/2015        |
| <b>Total Project duration (in months)</b> | 42 months (including <b>Extension of 6 months</b> ) |
| <b>Total budget</b>                       | € 2.369.263,00                                      |
| <b>Total eligible budget</b>              | € 1.869.762,00                                      |
| <b>EU contribution:</b>                   | € 934.880,00  |
| <b>(%) of total costs</b>                 | 39,46%  |
| <b>(%) of eligible costs</b>              | 50%   |

Beneficiary Data

|                         |   |
|-------------------------|---|
| <b>Name Beneficiary</b> | University of Florence-Department of Industrial Engineering of Florence (UNIFI)<br><br><i>The Department of Mechanics and Industrial Technologies (reported in the original proposal) merged into the Department of Industrial Engineering of Florence on 1st January 2013.</i> |
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## 1. Executive Summary (maximum 5 pages)

*Briefly describe the project objectives, key deliverables and outputs, and include a paragraph summarising each chapter of the main report. This summary should be a stand-alone text and must be provided in English as well as in the language in which the rest of the report is written.*

### **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 (commonly abbreviated END), appear to be extremely fragmented and inhomogeneous. Each country, during past years, adopted a set of strategies strictly related to their specific contexts; as a consequence strategy transfer among EU Countries is now a hard task.

The QUADMAP (QUIet Areas Definition and Management in Action Plans) project was focused on the problem of Quiet in Urban Areas, where not only noise limits have to be considered since noise itself is only one of the sources causing discomfort. The main objective of QUADMAP project was 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 Quiet Urban Areas (QUAs), with the aim to overcome the current impasse. These objectives were attained, leaving each responsible body free to produce its own Action Plan, assessing and addressing both specific territorial features and political priorities. The validated eventual results of the project will facilitate urban planners to apply standard procedures for identification, delimitation and prioritization of QUAs.

One significant part of the project has been devoted to develop and test methods for the determination of the relative weights of concurrent sources of discomfort, considering different acoustic factors and indicators.

Another important topic was the systematic use of soundscape analysis in the qualitative acoustic analysis, as well as in the general stakeholder opinion collection about present and desired features of selected QUA.

### **Key deliverables and outputs**

In Table 1, key deliverables and outputs of the project with related deadlines are illustrated.

**Table 1. QUADMAP project deliverables and outputs.**

| Name of the Deliverable (Code of the associated Annex)  | Code of the associated action | Deadline  | Annexed to:                    |
|---|-------------------------------|---|--------------------------------|
| 1 Monitoring handbook of the QUADMAP project-D1   | MON                           | 30/09/2011  | Inception Report<br>31/05/2012 |
| 1 Website-D2  | A.2                           | 31/12/2011  | Inception Report<br>31/05/2012 |
| 1 Database filled up with surveys and measurements-D3   | A.2, A.3, A.4, A.5            | 31/12/2012  | Mid Term Report<br>30/11/2013  |
| 1 Report on QUA surveys and data analysis. Report will be split in 4 parts according to analysed EU areas (various EU Countries)-D6   | A.2, A.3, A.4, A.5            | 31/12/2012  | Mid Term Report<br>30/11/2013  |
| 1 Report on 1st surveys done among stakeholders/visitors. Report will be split in 3 parts according to targeted Countries-D9  | C.7, C.8, C.9                 | 31/03/2013  | Mid Term Report<br>30/11/2013  |
| 1 Report about design internationalization-D11  | C.10                          | 30/11/2014  | Final Report<br>30/06/2015     |
| 1 Report on 2nd survey among stakeholders/visitors. Report will be split in 3 parts according to targeted Countries-D12   | C.7, C.11, C.12               | 30/11/2014  | Final Report<br>30/06/2015     |
| 1 Report on final optimized methodologies and their applications limits (if any). Report will include: 1 Instructions paper for the usage of related toolkits-D13   | D.13                          | 31/12/2014  | Final Report<br>30/06/2015     |
| 1 set of final toolkits (Guidelines)-D14  | D.13                          | 31/12/2014  | Final Report<br>30/06/2015     |
| 1 Final Project Report  | E.14                          | 30/06/2015<br>(Three months after the end of the project, 31/03/2015) | Final Report<br>30/06/2015     |
| <p>Scientific publications on journals and conference proceedings about the novel methodology.</p> <p>According to the proposed project partners will collect a total of 11 presences at conferences. During these meetings it is expected that at least 8 publications will be produced, considering the possibility that overlapping presences (e.g. Presence of 2 partners at the same conference) could culminate in jointed papers.</p> <p>About scientific journals, being these commonly employed in order to exploit really advanced research concepts and due to the demonstrativeness nature of the project itself, we think that 4 publications could be a realistic number-See Annex 5.</p> | E.14 to E.20                  | During and after the whole project                                    | Final Report<br>30/06/2015     |
| After-LIFE Communication Plan-D16   | E.24                          | For 5 years after the end of project                                  | Final Report<br>30/06/2015     |

The Project's implementation modalities are described below.

In the frame of Action Package A, an analysis of the state of the art about existing procedures adopted by EU Member States (The Netherlands, Belgium, Norway, United Kingdom, Italy, Germany, Spain, Portugal and France) in order to select, analyze and manage Quiet Urban Areas (QUAs) and about other projects related to urban noise and QUAs started. In this regard, a stakeholder's questionnaire was prepared and submitted in several European countries, asking the competent authorities involved in the implementation of the END about the methods used for selecting/analyzing/managing QUAs. 36 stakeholders from The Netherlands, Belgium, Norway, UK, Italy, Germany, Spain, Portugal and France filled in the questionnaire. The results of this activity are described in the D4 and D6 Project Deliverables (*"Report on the state of the art on UQUA management"* and *"Report on UQA surveys and data analysis"*, available at the Project website [www.quadmap.eu](http://www.quadmap.eu)).

At the beginning of 2013, a first draft version of the methodology was developed, starting from the analysis on the state of the art, from Project partners' experience and from results obtained with the stakeholders' questionnaires. This method, together with related and practical tools, is described in the Report on Action B.6 titled *"Proposal of a harmonized method for selection, analysis, management of Quiet urban areas and applicative Tools"* and attached as an additional deliverable (Deliverable D7 of the Project).

During 2013, in the frame of Action Package C, the first version of the methodology was applied in ten pilot cases located in Florence, Bilbao and Rotterdam and ante-operam data (quantitative and qualitative) were collected. With the first version of the methodology an effort was made in order to define a set of rules which can be accustomed in a general steering document. As an effect, methodologies have been developed in order to leave each Country free to adapt them based on the field activities. The aim is not to provide a rigid sequence of operations, but an effective procedure to be implemented despite of peculiarities of each Member state. From the analysis carried out on ante-operam data (collected in the pilot cases), it was possible to update the first version of the methodology with particular regards to the selection and analysis phases. Between May and December 2014 interventions aimed at solving criticalities detected in eight pilot areas during the ante-operam phase were also implemented. Consequently, analysis on post-operam data have been carried out during December 2014 and January 2015.

Moreover, with Action C.10 a harmonization among the different proposed solution with special regard to the possibility of generalizing them at EU and international level was performed. In particular, France was chosen as additional test country for the applicability and adaptability of the proposed methodology. From results obtained in this application, the possibility of transferring the methodology to other countries has been confirmed, bearing in mind that all the pilot cases selected by the project should be considered as good examples and not as templates to reuse systematically.

In the frame of Action D.13, achieved post-operam analysis lead to the development of the optimized version of the methodology (Deliverable D13), which was mainly devoted to improve the QUAs' management phase. From the optimized version of the methodology, explicative guidelines were produced.

Dissemination activities have been carried out with Action Package E, specifically aimed at presenting most significant results obtained by the QUADMAP Project during congresses, conferences and workshops and at reporting to EUROCITIES network and to EU DG Environment.

In current applications, the method can certainly be implemented at European level since it was established taking into account several experiences at European level and it has also been tested on pilot cases in three different Member States.

To facilitate the transferability of results, appropriate guidelines were prepared, together with tools and application examples derived from the pilot cases, and they have been translated in the languages of project partners.

The transferability of the method is also encouraged and strengthened by the following actions of dissemination:

1. Development of the website [www.quadmap.eu](http://www.quadmap.eu).
2. Dissemination at European level by:
  - the connection with other European projects;
  - the knowledge sharing with EUROCITIES, the network of major European cities, operating in 33 European countries and representing the interests of its members in dialogue with the European institutions across a wide range of policy areas affecting cities. EUROCITIES will allow the diffusion of results and will lead to support other countries willing to apply the proposed methodology. The periodic meetings carried out by the network itself define the way for the reaching of the 130 EUROCITIES members (some of the QUADMAP partners are also EUROCITIES members). The project's guidelines have been sent to EUROCITIES office which they will distribute to all European cities (member of EUROCITIES).

In this way, a continuous action of dissemination and demonstration of gained results can be an incitement to adopt the QUADMAP methodology in the cities, in order to improve the metropolitan quality of life year after year.

This report consists of six main chapters:

Chapter 1: brief description of Project objectives and key deliverables and outputs.

Chapter 2: brief description of the environmental problem addressed, the hypothesis to be demonstrated/verified by the project, the technical/methodological solution, the expected results/ environmental benefits and, finally, the expected longer term results.

Chapter 3: brief description of the management system in terms of working method, including overview of project phases, activities and tasks per phase, planning-Gantt chart, partners presentation, description of project's management activities, description of changes due to amendments to the Grant Agreement. In addition, evaluation of the management system in terms of Project management process followed by problems encountered and lesson learned about the management system.

Chapter 4: it consists of two paragraphs:

4.1 Description of the management system in terms of working method, including overview of project phases, activities and tasks per phase, planning-Gantt chart, partners presentation, description of project's monitoring activities, description of changes due to amendments to the Grant Agreement.

4.2 Evaluation of the management system including the Project management process, problems encountered and lesson learned about the management system.

Chapter 5: it represents the heart of the report. In this section the technical activities and the dissemination actions will be described. In particular, the chapter 5 consists of four paragraphs:

5.1 Description of technical actions

5.2 Description of dissemination actions

5.3 Evaluation of project implementation

5.4 Analysis of long-term benefits

Technical actions will be described as the following structure:

1. Brief description and objectives
2. Expected results (Quantitative information)
3. Actual results (what and how)
4. Time schedule
5. Indicators of progress
6. Problems encountered and solutions
7. Continuation of the Action after the conclusion of the Project (if expected)
8. Mention any complementary action outside LIFE (if expected)

Dissemination actions will be described as the following structure:

1. Brief description and objectives
2. Expected results (Quantitative information)
3. Actual results (what and how)
4. Problems encountered and solutions
5. Mention any complementary action outside LIFE (if expected)

Chapter 6: Annexes.



## 2. Introduction (1 page)

### **Environmental problem addressed**

The main targeted environmental problem is the need of a re-definition of QUAs. EU Directive on Environmental Noise defines “Quiet Area” as an area, delimited by the competent authority, which is not exposed, for instance, to a value of  $L_{den}$  or of another appropriate noise indicator higher of a certain threshold (set by the Member State) from any noise source. In fact, this definition is not clear enough to allow an appropriate assessment and management of QUAs in urban environment and it leaves Member States free in delimitating, assessing and planning the areas. The consequence of this “freedom of choice” resulted in non homogeneous collections of data as well as in a divergent approach across the EU.

### **Outlining the hypothesis to be demonstrated/verified by the project**

The main innovative aspect of QUADMAP, to be demonstrated/verified by the project, aims to elaborate a harmonized methodology for selecting, analysing and managing QUAs that is adaptable to all EU countries and based also on a soundscape approach, considering citizens’ perception and stakeholders’ opinions.

### **Description of the technical/methodological solution**

QUADMAP project proposes a methodology for the selection, assessment and management of QUAs as well as an improved definition of QUA. The methodology was inspired on the analysis of the state of the art and was based on the evaluation of both acoustical and non-acoustical variables. The method has been applied and tested on different typologies of QUAs (six schoolyards in Florence-Italy, a square and a green corridor in Bilbao-Spain and two public parks in Rotterdam-Netherlands). Data collected into pilot areas in ante and post operam scenarios have been fruitfully used for verifying and optimizing the method and the effectiveness of the implemented interventions.

### **Expected results and environmental benefits**

The main result of this project is a guideline about a harmonized methodology for selection, assessment and management (action planning) of QUAs. This result will overcome the current impasse related to the fragmentation of current practices: it will increase the success of QUAs management with respect to current procedures and will provide a good basis for a review of current directives. In the guidelines the importance of designing interventions able to reduce noise levels and/or increasing user’s satisfaction with the areas is highlighted. Moreover, among measures to be adopted, naturalistic interventions are those considered as more interesting for the requalification of the areas and they are highly recommended in the guidelines which are supposed to improve the diffusion of these typologies of interventions.

### **Expected longer term results**

Since Project’s guidelines have been produced in order to be easily applied and since it has been translated in the languages of Project’s partners, a wide diffusion of this document and of its application is expected. Dissemination of results achieved by the QUADMAP project will be carried out thanks to the connection with other European projects and also to the knowledge sharing with the project supporter EUROCITIES. Furthermore, the project gives a contribution for a possible END revision, for example including a new QUA definition based on both acoustic and non-acoustical data.

### 3. Administrative part (maximum 3 pages)

#### 3.1 Description of the management system

In Annex 1 a list of project's actions and a brief description of each of them is presented. For a further analysis of each action and related tasks, please see section 5.1 and 5.2.

In Annex 2 the Gantt chart is reported. Both the originally proposed actions planning and that one revised after the second amendment request (see section *Description of changes due to amendments to the Grant Agreement* page 17) are illustrated.

About the partners' presentation, please see the Annex 3.

#### **Project monitoring activities**

During the action E.21-PM the project management activities have been carried out as expected. In particular, the kick-off meeting was organized on 7th of October 2011 and hosted in Florence. During the kick-off meeting practical information were given to all partners. Furthermore, Technical Project Management unit and General Monitoring unit, as well as Scientific Committee and Steering Committee were defined during the kick-off meeting. A specific action (E.22-MON) has been started for monitoring activities foreseen by Life+ Common Provisions. During the kick-off meeting, the monitoring strategies have been agreed with all the partners. The strategy is formalized in the "Monitoring Handbook" (the current release version is attached to this report, see D1). Action E.22-MON is meant to keep a constant check on the activities development and, each semester (originally foreseen each trimester, but the monitoring period changed on December 2012 based on project start-up experience, see section 5.1.22 for details), the project is monitored by the coordinator. Generally speaking, the monitoring is performed according to the documentation provided by the partners which is gathered by the monitoring unit and assessed by the scientific and steering committees.

Further details about monitoring activities are provided directly on the Monitoring Handbook. The first monitoring assessment was performed on the 23rd of January 2012 in Florence, during a meeting of the project partners. During this meeting each partner also provided a brief presentation about the progress of the ongoing project Actions.

Five internal meetings have been organized in order to solve internal questions and to take important decisions concerning the project progresses: the first one in Paris on the 28<sup>th</sup> November 2012, the second one in Brussels on the 23<sup>rd</sup> January 2013, the third in Bilbao on the 26<sup>th</sup> November of the same year and the last two in Florence, respectively on the 20<sup>th</sup> February and on the 18<sup>th</sup> December 2014. In addition a Skype conference was held on the 16<sup>th</sup> of May 2014. Minutes of internal meeting are enclosed (see Annex 16).

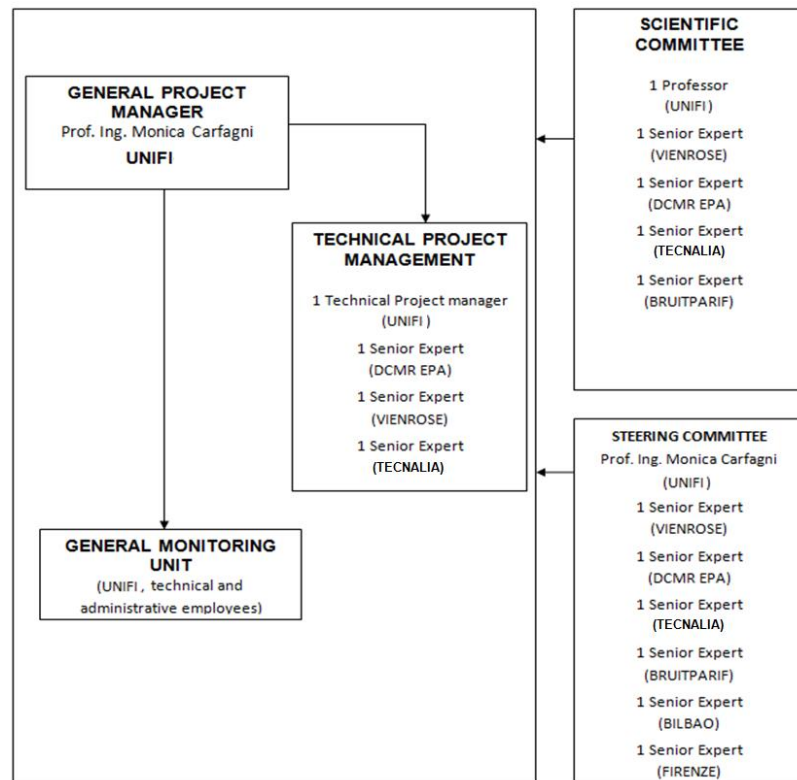
Regarding other activities, a workshop titled "Practices on Acoustic Comfort in Urban Design" and fully devoted to QUADMAP was organized by partners Bilbao and TECNALIA on 27th November. The following day a second workshop titled "The role of Urban Design elements in Soundscape and acoustic comfort in cities" was held, again in Bilbao. Another workshop fully devoted to QUADMAP was organized on the 19<sup>th</sup> of December 2014 in Firenze by the Municipality of Firenze and Vienrose and it was focused on realized interventions in Italian pilot areas. Partner Bruitparif has organized two local meetings on Quadmap in Ile de France during 2012 and a workshop on Quadmap results on the 6<sup>th</sup> of March 2015. Eventually, partner DCMR organized the final project event in Rotterdam on the 19<sup>th</sup> and 20<sup>th</sup> of February 2015.

The monitoring unit, the scientific committee and the steering committee were set up in order to monitor the project implementation.

The technical project management has been carried out by UNIFI, DCMR EPA, VIENROSE, TECNALIA in order to ensure the coordination of the technical activities of the project.

All the reports foreseen in the original proposal have been delivered in time or with a minor delay respect to what was expected.

Other reports (e.g. Report on Networking Activities), not expected as deliverable in the original proposal, were delivered and attached to this report (see Annex A4).



|  |  |
|--|--|
| <b>General Project Manager</b>   | UNIFI : Monica Carfagni  |
| <b>Scientific Committee</b><br>Provides scientific quality check of the whole project. Its members will participate to general project meetings                          | UNIFI : Lapo Governi<br>DCMR: Mirian Weber<br>TECNALIA: Itziar Aspuru Scroaga<br>VIENROSE: Raffaella Bellomini<br>BRUITPARIF: Piotr Gaudibert  |
| <b>Steering committee</b><br>Coordinate and monitor the overall progress of the actions (according to information provided by monitoring unit)                           | UNIFI : Monica Carfagni<br>DCMR: Henk Wolfert<br>TECNALIA: Igone Garcia Perez<br>VIENROSE: Raffaella Bellomini<br>BRUITPARIF: Piotr Gaudibert<br>FIRENZE: Arnaldo Melloni<br>BILBAO: Francisco Viñez |
| <b>Technical project management</b><br>Takes care of managing and supervising the pilot case studies design, development and results                                     | UNIFI : Lapo Governi<br>DCMR: Mirian Weber<br>TECNALIA: Igone Garcia Perez<br>VIENROSE: Sergio Luzzi   |
| <b>General monitoring unit</b><br>Gathers financial, administrative and progress information from the project partners (trimester base) and produces preliminary reports | UNIFI: Cristina Dolfi + Contract Researcher  |

## Description of changes due to amendments to the Grant Agreement

During the QUADMAP project two amendments to the Grant Agreement have been requested and allowed by the EC.

An amendment request was submitted referring to the legal status change of one of the Associated Beneficiaries. Based on the acceptance of this request, the partner name “LABEIN” has been replaced by “TECNALIA”, as already mentioned in the IR and in the MTR. The second amendment request was submitted in June 2014, asking for an extension of the project duration from 30/09/2014 to 31/03/2015. The request was mainly due to delays occurred in Firenze and Rotterdam for the realization of the interventions.

As a minor formal change, it should be noted that the Coordinating Beneficiary changed its status on 1st January 2013. In fact, the Department of Mechanics and Industrial Technologies merged into the Department of Industrial Engineering on 1st January 2013. Based on this point, since 1st January 2013, the Coordinating Beneficiary has been used “UNIFI” as acronym in the place of “UNIFI-DMTI” reported in the original proposal.

## 3.2 Evaluation of the management system

### Project management process

General strategy and monitoring forms have been proposed to the partners and discussed during the kick-off meeting. The monitoring strategy has been accepted by the partners during the kick-off meeting and successively modified in the second meeting in Firenze (see Deliverable-D1).

Since this meeting, the project was monitored by the coordinator each semester, instead of each trimester as initially agreed. The monitoring was performed according to the

documentation provided by the partners, which was gathered by the monitoring unit and assessed by the scientific and steering committees.

### **Problems encountered**

Especially during the first months after the beginning of the project, a considerable delay occurred in the SMF's submission by partners. A consequent additional delay followed, due to the work to be carried out after receiving the first versions of the SMFs from the partners, in order to obtain integrations and perform corrections. In order to solve this inconvenient, UNIFI, in its role of coordinating beneficiary, made the recalls for the monitoring documentations' deadlines more frequently.

Despite recommendations and multiple requests made by UNIFI, in its role of coordinating beneficiary, Bilbao municipality hasn't provide Self-Monitoring Forms since the monitoring period ended in September 2013. As a consequence, in the last period of the project UNIFI was provided information about Bilbao municipality's work only indirectly, with TECNALIA playing the role of intermediary.

This scenario was considered acceptable since the work has been performed by Bilbao municipality even if the documentation for the last period was provided only at the end of the project.

## 4. Technical part (maximum 50 pages)

### 4.1 Technical progress, per task

#### 4.1.1 Action A.1 – Action leader UNIFI

##### Brief description and objectives

Action A.1 aimed at coordinating the other actions of Package A and to organize the **Project kick off meeting**. Additional objectives of Action A.1 were a **data collection about other project** (in particular Life projects), the definition of **methods for data collection** about citizens' opinions and the **design of database** both beta and final versions in order to collect stakeholders questionnaires.

##### Expected results (Quantitative information)

- A report about database design and the database infrastructure up and running in its beta version;
- The project website with web-based questionnaires and forum and other information such as project objectives, the distinguished Work Packages, preliminary result, news, interesting links, report of progress;
- Deliverables: D2- 1 Online Database with authenticated access – beta version release.

##### Actual results (What and How)

| Tasks foreseen in the Project proposal  | What has been done   |
|---|--|
| Task 1: Data collection about past and ongoing European projects about quiet areas.                             | Web research and literature study about most significant projects concerning environmental noise and quiet areas specifically.   |
| Task 2.1 Coordinating activity and definition of communication modalities.                                      | During the kick off meeting held in Florence on October 2011 the kind of the acquisition modalities and storage solutions for required data was agreed between the Project coordinator and the scientific and steering committees. |
| Task 2.2: Database design and build up/D2 - 1 Online Database with authenticated access – beta version release. | The Beta-version of the database has been completed by the end of March 2012.  |
| Report about database design and the database infrastructure up and running in its beta version.                | Report titled “Instructions for the usage of the database web application” has been produced and attached to the IR.   |
| Task 3: Website coding, design and administration.  | Website has been coded by DCMR EPA (see Action E.15), UNIFI has provided the website design and the administration of contents (see Action E.14)   |

Action A.1 started up with an initial phase of coordination and kick off meeting during which the main communication modalities were defined.

Subsequently a web research has been made, as well as a literature study about most significant projects concerning environmental noise carried out in the last fifteen years. Among these projects the ones focused on quiet areas were selected.

| <b>Significant LIFE Projects concerning environmental noise (Start year)</b> | <b>LIFE + projects focusing on quiet areas (Start year)</b> |
|--|---|
| DIAPASON (1997)  | SYLVIE (1999)   |
| Noise (1998)   | QSIDE (2009)  |
| SYLVIE (1999)  | HARMONICA (2010)  |
| GOAL (2000)  |   |
| SMILE (2000)   |   |
| SMASH-EVENTS (2000)  |   |
| CYNOISE (2002)   |   |
| GIPSYNOISE (2002)  |   |
| IMMACULATE (2002)  |   |
| RAVE (2002)  |   |
| SIDDARTHA (2003)   |   |
| LINFA (2004)   |   |
| SPAS (2006)  |   |
| DECIBELL (2007)  |   |
| P.A.A.S.A CUENCA (2008)  |   |
| HUSH (2008)  |   |
| QSIDE (2009)   |   |
| NADIA (2009)   |   |
| NOISEFREETEX (2009)  |   |

In addition, during the first period, each partner worked on the development of an English format for the stakeholder questionnaire and sent a draft version to the coordinating beneficiary that matched the different versions into a final one. A final discussion and approval of the questionnaire was carried out during the meeting of 23<sup>rd</sup> January 2012.

About the database structure, it has been developed in order to have:

- a section containing questionnaires for stakeholders;
- a section containing questionnaires for end users (citizens);
- a section to execute queries and download them (e.g. As excel sheet).

Database is strictly linked to website (in charge of DCMR EPA). Database developers of UNIFI have been in continuous contact with website developers of DCMR EPA.

In both the meetings of 7<sup>th</sup> October 2011 and 23<sup>rd</sup> January 2012, the relations between database and website were discussed in details. The Beta-version of the database has been completed by the end of March 2012.

#### Problems encountered and solutions

Difficulties in hiring contract personnel have been encountered at the beginning of the Action and they led to a greater effort of internal personnel. The situation has been balanced in the rest of the Action and in the following ones. This problem was presented in the Inception Report and the proposed solution was accepted by EC (according to the letter of EC on 1<sup>st</sup> August 2012, see Annex X).

### **4.1.2 Action A.2 – Action leader DCMR**

#### Brief description and objectives

Action A.2 aimed at collecting and analysing methods and citizen's opinions for selecting/analysing/managing of QUAs in Netherlands, Belgium, UK and Norway.

### Expected results (Quantitative information)

- A representative number of returned questionnaire forms (via web);
- A report about the data analysis and the findings (hard copy and on the web site downloadable) including possible directions for finding a suitable methodology.
- Deliverables: D4-1 Report on state of the art on UQA management, D3- 1 Database filled up with surveys and measurements, D6- 1 Report on UQA surveys and data analysis.

### Actual results (what and how)

| Tasks foreseen in the Project proposal   | What has been done  |
|--|---|
| Collection of methods and citizen's opinion for QUAs in Netherlands, Belgium, UK, Norway/ D3- 1 Database filled up with surveys and measurements | Data collection has been achieved in the Netherlands, Belgium, UK and Norway by means of a web-based questionnaire. The designed database (see Action A.1) was filled up with data obtained in the cities of expertise. |
| Representative number of returned questionnaire forms  | In total 47 respondents are contacted via e-mail and additional face-to-face interviews have been held in April 2012.   |
| D4-1 Report on state of the art on UQA management  | The final version of the <i>Report on State of the art and UQA management</i> was approved on September 2012.   |
| D6- 1 Report on UQA surveys and data analysis.   | The final version of the report <i>Report on UQA surveys and data analysis</i> was approved on December 2012.   |

The activities carried out by DCMR EPA are shown below.

- Work on the draft stakeholders' questionnaire, finalization and submission of the stakeholders' questionnaire to selected contacts in UK, Netherlands, Norway and Belgium. In total 47 respondents are contacted via e-mail and additional face-to-face interviews have been held in April 2012.
- Work on the final version of the website ([www.quadmap.eu](http://www.quadmap.eu)) that was launched in January 2012 and also realization of the web space for the web questionnaires. Expert support has been given to UNIFI (Action A.1) for the development of the database and the linkages to the website.
- Start of the promotion of the QUADMAP project by means of announcements on the weblog of Working Group Noise EURO CITIES (DCMR EPA presides this working group), by sending messages on the start of this project on twitter (@quadmap\_eu), Linkedin and Facebook and mentioning it during presentations held on numerous occasions in Europe. The project was on the agenda of the autumn meeting of Working Group Noise in Turin as well and will be on the agenda frequently.
- Start of a desk study aimed to collect all kinds of reports, presentations, papers, etc. on the subject of quiet urban areas in Europe in general, but especially in The Netherlands, Belgium, Norway and United Kingdom. Desk study has been set up by Bachelor student in cooperation with the other staff.
- The input for the project's state of the art report has been delivered and the final version of the report has been approved during the January 2013 meeting in Brussels.

### Time schedule

Action A.2 started on 1st September 2011 and had a total duration of 18 months. It was concluded by February 2013 with two months of delay. Following the Gantt chart of the Action A.2.



| Action A.2             | 2011      |    | 2012 |    |     |    | 2013 |     |     |    |     |     |
|------------------------|-----------|----|------|----|-----|----|------|-----|-----|----|-----|-----|
|                        | September | IV | I    | II | III | IV | I    |     |     | II | III | IV  |
|                        |           |    |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |
| A2 (original proposal) |           |    |      |    |     |    |      |     |     |    |     |     |
| A2 (actual)            |           |    |      |    |     |    |      |     |     |    |     |     |

#### Problems encountered and solutions

Action A.2 has been concluded in February 2013, with two months of delay according to the contribution on methodology review process. This delay does not seem to be influent for the project progress.

Percentage of budget spent is lower than expected because DCMR uses internal no cost personnel (students) in the place of external resources expected in the original proposal. This choice is considered also good for the project, based on the fact that the action's technical aims have been achieved despite of minor personnel costs.

### **4.1.3 Action A.3 – Action leader VIENROSE**

#### Brief description and objectives

Action A.3 aimed at collecting and analysing citizens' opinions and methods for selecting/analyzing/managing of QUAs in Italy and Germany.

#### Expected results (Quantitative information)

5 Deliverables: D4-1 Report on state of the art on UQA management, D3- 1 Database filled up with surveys and measurements, D6- 1 Report on UQA surveys and data analysis.

#### Actual results (what and how)

| Tasks foreseen in the Project proposal   | What has been done  |
|--|---|
| Collection of methods and citizen's opinion for QUAs in Italy and Germany/ D3- 1 Database filled up with surveys and measurements. | More than 100 contacts and more than 30 filled in questionnaires. The designed database (see Action A.1) was filled up with data obtained in the cities of expertise. |
| D4-1 Report on state of the art on UQA management.   | The final version of the <i>Report on State of the art and UQA management</i> was approved on September 2012.   |
| D6- 1 Report on UQA surveys and data analysis.   | The final version of the <i>Report on UQA surveys and data analysis</i> was approved on December 2012.  |

The activities carried out by VIENROSE are shown below.

- Analysis of the state of the art in Italy about Quiet Areas selection, assessment and management.
- Start of the data collection and analysis based on the Stakeholders Questionnaires.
- Work on the end-users questionnaire elaboration.

Concerning Quiet Areas in agglomeration, a selection of Italian and German cities considered agglomeration according to the END has been made, followed by the data collection and analysis. Different significant approaches have been found and described, especially in Turin and Florence. Input for the project's State of the Art report had been provided to Coordinating

Beneficiary. The last few questionnaires were collected between late November and mid-December, being able to send last data to Coordinating beneficiary on time.

#### Problems encountered and solutions

Problems encountered and solutions are summarized below:

- difficulty in identifying a contact person for this issue, because in most cases there wasn't a person responsible for this; the problem was addressed by asking different department (environment, ecology, mobility ...);
- difficulties with German cities to explain exactly what the questionnaire asked, in several cases the officers spoke poor English and consequently returned the filled questionnaires in German, so a translation has been necessary;
- some difficulties and problems in uploading questionnaires on database which have been solved at the end of the action lasting.

#### **4.1.4 Action A.4 – Action leader TECNALIA**

##### Brief description and objectives

Action A.4 aimed at collecting and analysing citizen's opinions and methods for selecting/analysing/managing of QUAs in Spain.

##### Expected results (Quantitative information)

- A representative number of returned questionnaire forms (via web);
- Deliverables: D4-1 Report on state of the art on UQA management, D3- 1 Database filled up with surveys and measurements, D6- 1 Report on UQA surveys and data analysis.

##### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>   | <b>What has been done</b>  |
|---|--|
| Task 1: Literature study of publications and existing national or local projects in Spain and Portugal devoted to the subject/D4: 1 Report on state of the art on UQA management.   | The final version of the <i>Report on State of the art and UQA management</i> was approved on September 2012.  |
| Task 2: Questionnaire and interviews to Spanish and Portuguese Public Administrations to collect their experiences and approaches in the definition of Urban Quiet Areas. On that sense all Agglomerations referred in action A.1 will be considered./D3- 1 Database filled up with surveys and measurements. | The questionnaire model has been sent and a significative number of answers has been obtained (via web) and analyzed. The designed database (see Action A.1) was filled up with data obtained in the cities of expertise.        |
| Task 3: An analysis of perception in one of the pilot cases is developed and some meeting with the Bilbao municipally were done to define the following steps of the project regarding the peri-urban area./D6- 1 Report on UQA surveys and data analysis.  | Selection of pilot areas and performance of the first perception analysis.<br>The final version of the report <i>Report on UQA surveys and data analysis</i> was approved on December 2012.                                      |
| Task 4: Data collection considering not only noise pollution but other sounds. D6- 1 Report on UQA surveys and data analysis.   | In the peri-urban area (green ring) the composition of birds in the area (biodiversity analysis) complement the study in order to identify the different sound atmosphere depending on the presence of different types of birds. |

In relation with task 4.2, the municipalities of Spain and Portugal have been contacted to obtain information regarding the management of Quiet Areas. Results of this task are detailed in the deliverable D3. On the other hand, the information obtained in data collection task using questionnaires, was updated in the online database related with the Action A.1 of the project.

Regarding the task 4.3, the peri-urban area for the QUA analysis has been selected: linked to Green Corridor of Bilbao. It is a not noise polluted area that will have some maintenance activities in connection with greenery. In the case of the urban area, some questionnaires were developed to analyse the uses and function of the areas and the perception regarding noise pollution and sounds.

Results of the questionnaires submitted in both the pilot areas, already developed in the period July-September, were analysed to define the homogeneous unit for the Action C.12.

#### Time schedule

Action A.4 started on 1st September 2011 and had a total duration of 16 months. It was concluded by December 2012 accordingly. Following the Gantt chart of the Action A.4.

| Action<br>A.4          | 2011      |    | 2012 |    |     |    | 2013 |     |     |    |     |     |
|------------------------|-----------|----|------|----|-----|----|------|-----|-----|----|-----|-----|
|                        | September | IV | I    | II | III | IV | I    |     |     | II | III | IV  |
|                        |           |    |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |
| A4 (original proposal) |           |    |      |    |     |    |      |     |     |    |     |     |
| A4 (actual)            |           |    |      |    |     |    |      |     |     |    |     |     |

#### Indicators of progress

Issuing of three deliverables (D3, D4, D6). In addition, applicable indicators of progress described in action E.22 (monitoring) - section “evaluation” have been adopted.

#### Problems encountered and solutions

No problems were advisable during this Action.

### **4.1.5 Action A.5 – Action leader BRUITPARIF**

**Planned action lasting: 16 months (1<sup>st</sup> September 2011-31<sup>st</sup> December 2012)**

#### Brief description and objectives

Action A.5 aimed at collecting and analyzing citizens' opinions and methods for selecting/analyzing/managing of QUAs in France, having specific characteristics of similarity with those selected by the other partners in their assigned countries.

#### Expected results (Quantitative information)

- A compact report on the literature study and report about the experiences and the approaches of French authorities
- The implementation of the database set up in the action A.1.
- Participation to the finalization of the Quadmap global methodology
- Deliverables: D4-1 Report on state of the art on UQA management, D3- 1 Database filled up with surveys and measurements, D6- 1 Report on UQA surveys and data analysis.

#### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>  | <b>What has been done</b>  |
|--|--|
| A compact report on the literature study and report about the experiences and the approaches of French authorities/D4-1 Report on state of the art on UQA management | Many selective approaches about QUAs from Paris, Rennes, Lyon, Mont Valérien and other French cities, were collected, synthesized and translated.<br>The final version of the <i>Report on State of the art and UQA management</i> was approved on September 2012.<br>Research projects from French laboratories were collected and synthesized. Furthermore, the essential parts of the French National Guide about Quiet Area were also translated and synthesized with the help of the authors. 10 July 2012. |
| The implementation of the database set up in the action A.1/ D3- 1 Database filled up with surveys and measurements  | 40 questionnaires were distributed on two workshops and by emails. At the end of this action in January 2013, only three questionnaires were fully completed. The designed database (see Action A.1) was filled up with data obtained in the Country of expertise.   |
| Participation to the finalization of the Quadmap global methodology/ D6- 1 Report on UQA surveys and data analysis.  | The final version of the report <i>Report on UQA surveys and data analysis</i> was approved on December 2012.  |

About the implementation of the database, the questionnaire translated in French in June was distributed to French Stakeholders. 40 questionnaires were distributed on two workshops and by emails. At the end of this action in January 2013, only three questionnaires were fully completed and transfer to the database. Many questionnaires were not completely filled by French stakeholders. Stakeholders are interested but it seems too early, for most of them involved in the process of noise management linked with the END, to give substantial feedback about the analysis and management of Quiet area.

About the participation to the finalization of the Quadmap global methodology, since October 2012 Bruitparif has sent complementary documents and gave explanations to the coordinator about methodologies proposed in the report “State of the art” submitted to the coordinator on 10 July 2012 which included also details about the rQUA method. rQUA is a tool for pre-selection of potential quiet area with the add value to find some possible area with an important sound contrast. This step of pre-selection of potential quiet areas from the noise maps, rQUA consists in locating the sites that can considered as quiet areas thanks to an exclusively acoustic criterion, but is not a filter, It is helpful to begin a discussion with stakeholder (technical staff) or a consultation of the public as in the city of Paris. To select potential quiet area, we need at least three steps: rQUA, consultation of stakeholders (technical staff) or public and cross with other GIS information about use and function consultation. For example in Paris, the presentation of potential quiet areas (preselection by the use of GIS and relative noise) in the inhabitants consultation meeting was well appreciated and used to launch a joint reflection framing exchanges. The objective is to confront the local feelings with the acoustic selection with noise maps.

The global methodology for the Quadmap project was discussed between partners and Bruitparif was involved in the elaboration of the final document as all partners of the project until end of March 2015.

Complementary activities carried out by BRUITPARIF are shown below.

- search contacts, articles and examples in our Country (literature study, preparatory phase).
- contacts with the French research laboratories working on the subject of Quiet area.
- exchanges with representatives of big cities (Greater Lyon and acouité, Nantes metropolitan).
- exchange with the IAU and CRETEIL and literature study for the elaboration of the stakeholders Questionnaire.
- finalizing the methodology to identify and characterize quiet areas (in collaboration with the city of Paris). For this purpose, a new, simple and comprehensive approach has been developed and implemented in the city of Paris.
- talks about the Quadmap project in each meeting and phone contacts with local authorities.

#### Problems encountered and solutions

No problems were advisable during this Action.

### **4.1.6 Action B.6 – Action leader UNIFI**

#### Brief description and objectives

Action B.6 aimed at choosing the best methods for selecting, analysing (by using both quantitative and qualitative approaches) and managing QUAs referring to different QUAs typologies: i.e. school garden, quiet areas in the city centre, etc. and according to surveys results (collected in the database, Package A).

#### Expected results (Quantitative information)

- Methodologies development report
- Beta version of Tool kits to apply the methods

#### Actual results (What and How)

| Tasks foreseen in the Project proposal   | What has been done  |
|--|---|
| Report about the development of the methodology to select, analyse and manage QUAs Beta version of Tool kits to apply the methods. | An additional deliverable D7-1 Report <i>Proposal of a harmonized method for selection/analysis/management of quiet urban areas and applicative tools</i> not foreseen in the original proposal has been produced at the beginning of 2013. |

For further details about followed procedure to achieve the foreseen objectives of Action B.6, please refer to D7.

#### Time schedule

Action B.6 started on 1st April 2012 and had a total duration of 11 months. It was concluded by February 2013 with two months of delay. Following the Gantt chart of the Action A.1.

| Action B.6 | 2011      |    | 2012 |    |     |    | 2013 |     |     |    |     |     |
|------------|-----------|----|------|----|-----|----|------|-----|-----|----|-----|-----|
|            | September | IV | I    | II | III | IV | I    |     |     | II | III | IV  |
|            |           |    |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| B6 (original proposal) |  |  |  |  |  |  |  |  |  |  |  |  |
| B6 (actual)            |  |  |  |  |  |  |  |  |  |  |  |  |

#### Problems encountered and solutions

A delay in submission of the report on the state of the art from the other partners and a delay in uploading the stakeholders questionnaire data on the online database occurred. A discussion about these problems took place in the meeting in Paris at the end of November 2012 in which the encountered problems were solved. An analysis of answers to questions strictly related to the development of the harmonized procedure has been eventually done and results are presented in the report about the delivered methodology (D7).

In order to allow the solution of the problems the action end has been postponed by 2 months (28<sup>th</sup> February 2013). This delay didn't influence the general project progress.

### **4.1.7 Action C.7 – Action leader DCMR**

#### Brief description and objectives

Action C.7 aimed to the selection of case studies (quiet areas in the city centre and residential places) in The Netherlands and to the planning, design and accomplishment of different interventions. Ante and post-operam data acquisition and surveys to test the methodology according to action B.6 results were foreseen.

#### Expected results (Quantitative information)

For selection and analysis/design:

- D8-Maps with the selected and delineated quiet (urban) areas in the Greater Rotterdam Area with noise levels in LDEN and LNIGHT and if available other data – ante-operam;
- D9- 1 Report on 1st survey done among stakeholders/visitors;
- Report to developer's methodology for improvement of the analysis methodology;
- Management and maintenance plans documents approved for each quiet area.

For management:

- Implementation of the measures/interventions (see Action C.7);
- Report on experiences gained after implementation of the interventions;
- D10-Maps with the selected and delineated quiet (urban) areas in the Greater Rotterdam Area with noise levels in LDEN and LNIGHT and if available other data – post-operam;
- Report on the conclusions about the improvement achieved by both the management activities and the intervention;
- D12-Report and 2nd survey among stakeholders;
- Training materials to be used for increasing awareness of municipal technical staff and for sharing the findings of the project.

#### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>  | <b>What has been done</b> |
|--|---------------------------|
| D8: Maps with the selected and delineated quiet (urban) areas in the Greater Rotterdam (ante-operam) | See D.8                   |
| D9: Report on 1st survey done among stakeholders/visitors  | See D.9                   |
| Report to developers methodology for improvement of the analysis methodology                         | Included in D9.           |

|   |   |
|---|---|
| Management and maintenance plans documents approved for each quiet area.  | Included in D9.   |
| Implementation of the measures/interventions  | Well-implemented interventions of low noise paving near the Southern park were concluded on August 2014 and those near the Spinoza park were concluded on December 2014 |
| Report on experiences gained after implementation of the interventions  | Included in D12.  |
| Map with the selected and delineated quiet (urban) areas in the Greater Rotterdam (post-operam)                                 | See D.10.   |
| Report on the conclusions about the improvement achieved by both the management activities and the intervention                 | Included in D12.  |
| Report and 2nd survey among stakeholders  | See D12.  |
| Training materials to be used for increasing awareness of municipal technical staff and for sharing the findings of the project | See D14.  |

In the last months two pilot cases have been selected in Rotterdam (Southern park (Zuiderpark) and the Spinoza Park. By means of a visit by noise experts these areas have been characterized mainly on non-acoustic and acoustic factors. By means of a questionnaire the appreciation of the visitors (ante-operam) was inventoried. Noise measurements have been conducted in both areas, during several days up to 2.5 weeks. In each park 80 respondents were interviewed, using the questionnaire developed by the Project team as agreed by all consortia member. This questionnaire has been translated into Dutch; no further changes have been made. All achieved ante-operam data have been assessed accordingly and submitted to UNIFI for further analysis.

The interventions, laying quiet asphalt layers on the Groene Kruisweg and the Spinozaweg, started and were completed respectively on August and December 2014. Post-operam data were collected within January 2015.



#### Time schedule

Action C.7 started on March 2013 and had a total duration of 16 months. It was concluded on December 2014 with two months of delay with respect to the deadline established after the approval of the project amendment. Following the Gantt chart of the Action A.1.

| Action C.7             | 2012 |    |     |    | 2013 |     |     |    |     |     | 2014 |    |     |      |      |      | 2015 |    |
|------------------------|------|----|-----|----|------|-----|-----|----|-----|-----|------|----|-----|------|------|------|------|----|
|                        | I    | II | III | IV | I    |     |     | II | III | IV  | I    | II | III | IV   |      |      | I    | II |
|                        |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |      |    |     | IV.1 | IV.2 | IV.3 |      |    |
| C7 (original proposal) |      |    |     |    |      |     |     |    |     |     |      |    |     |      |      |      |      |    |
| C7 (actual)            |      |    |     |    |      |     |     |    |     |     |      |    |     |      |      |      |      |    |

Action C.7 was concluded with two additional months of delay (January 2014) behind the new closing time of the Project. This was due to circumstances depending on the road and sewer constructions at the Spinozaweg. As a consequence, the collection of post-operam data in Spinoza park was delayed to January 2015 due to works on the local sewer infrastructure. The occurred delay was considered acceptable because the action ended in time to permit the data analysis and completion of the Project guidelines within the final event in February 2015.

#### Problems encountered and solutions

A part from the delay occurred, no (other) specific problems were encountered.

### **4.1.8 Action C.8 – Action leader FIRENZE**

#### Brief description and objectives

Action C.8 was aimed at the selection of case studies (school gardens and squares) in the city of Florence as Project's pilot cases in order to test the methodology and implement alternative interventions.

#### Expected results (Quantitative information)

- D8-Map with the selected and delineated quiet (urban) areas in Florence with noise levels in LDEN and LNIGHT and if available other data – ante-operam
- D9-Report on 1st survey done among stakeholders/visitors



- Report to developers methodology for improvement of the analysis methodology
- Management and maintenance plans documents approved for each quiet area.

#### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>  | <b>What has been done</b>  |
|--|--|
| Selection of case studies (school gardens and squares) in the city of Florence                     | Pilot cases definition and identification (6 pilot cases)  |
| D8-Ante-operam noise maps  | Maps with the selected and delineated quiet (urban) areas in Florence with noise levels in LDEN and L NIGHT (from Strategic noise map of Florence – data 2011) and other available data have been supplied by partner VIENROSE. See D.8.                                   |
| D9-Report on 1st survey carried out among stakeholders / visitors                                  | See D.9  |
| Implementation of measures/interventions   | Well-implemented measures of low noise barriers, naturalistic interventions (e.g. planting of autochthonous species), and introduction of new furniture or minor interventions to reduce limit speed have been concluded in five schoolyards in Florence by December 2014. |
| Report to methodology developers as feedback to improve and refine the above mentioned methodology | See D.12.  |
| Management and maintenance plans documents approved for each quiet area.                           | See D.12.  |

According to the tasks of the proposal, achieved actions are the following:

- contribution to the report on 1st surveys done among stakeholders/visitors (see deliverable D9) as regards pilot cases selected in Florence with a report summarizing results for the six Italian pilot areas;
- in the same report first suggestions have been given in order to optimize the general methodology, in relation to specific typologies of areas investigated in Florence;
- interventions in five schools have been concluded within December 2014. The intervention in the “Paolo Uccello School” hasn’t been implemented because the school management decided to wait for another type of reduction noise action (windows substitution).



### Time schedule

Action C.8 started on 1st January 2013 and had a total duration of 23 months. It was concluded in January 2015 with three months of delay respect to the deadline established after the approval of the project amendment. Following the Gantt chart of the Action C.8.

| Action C.8             | 2012 |    |     |    | 2013 |     |     |    |     |     | 2014 |    |     |    | 2015 |     |     |    |
|------------------------|------|----|-----|----|------|-----|-----|----|-----|-----|------|----|-----|----|------|-----|-----|----|
|                        | I    | II | III | IV | I    |     |     | II | III | IV  | I    | II | III | IV | I    |     |     | II |
|                        |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |      |    |     |    | I.1  | I.2 | I.3 |    |
| C8 (original proposal) |      |    |     |    |      |     |     |    |     |     |      |    |     |    |      |     |     |    |
| C8 (actual)            |      |    |     |    |      |     |     |    |     |     |      |    |     |    |      |     |     |    |

### Problems encountered and solutions

Problems (or best changes respect to the original proposal) encountered are summarized below.

Till September 2013, no major problems have been encountered. The only relevant aspects to be taken into account are that the work planned in the project proposal nearly doubled. So, an agreement with the partner VIENROSE has been taken, establishing that some of the activities that were originally in charge of partner VIENROSE would have been carried out by FIRENZE partner. In particular, the structural design actions, safety coordination during the construction phase and the direction of the work will be performed at no additional cost for the project, by FIRENZE partner with its own resources, while the VIENROSE will handle all pre-post-operam noise activities (according to method deriving from action B6) for the 6 pilot cases as well as all the activities connected with architectural and acoustic design of all interventions. Referring to the interventions foreseen in the six pilot cases, projects were concluded and approved for all pilot cases at the beginning of 2014. Then, the management of school Paolo Uccello, via Pistoiese, requested a different type of intervention, more oriented towards noise reduction inside the building. Finally, City of Florence decided to comply with school's management decision, after a technical evaluation. Therefore the intervention of Paolo Uccello has been removed by Quadmap project. Finally, the number of cases remains major than expected in the original proposal. In the original proposal the intervention realizations were expected within March 2014. In the first phase of the project, a minor delay was expected but, when the approved design were presented to the school management officers during 2013, they asked the interventions to be realized during the summer period instead of January-June 2014, to permit the full usability of school yards for teaching purposes during the whole school period. Finally, Firenze decided to follow the school management indications and requests. Consequently, dealing with Firenze Municipality, the delays are confirmed in six months, since the interventions realization has been scheduled in 2014 during summer time, to guarantee the regular school activities and to minimize risk due to the presence of construction in the school gardens. In the period April 2014-September 2014 two public tenders have been performed, each one related to the interventions in two schools. The interventions in the fifth school were considered minimal, they will be realized by the municipality staff. The intervention realization started in July 2014. In the period August/September some problems arose:

- due to unexpected interferences, during construction phase, with underground urban services;
- due to the weather conditions, that caused delays in the construction timetables.

According to the problems occurred, three months of delay occurred. The delay was considered acceptable because the action ended in time to permit the data analysis and completion of guidelines within the final event in February 2015.

#### Mention any complementary action outside LIFE

According to the Project proposal, four pilot areas should have been chosen in order to test the methodology. In the first phase of Action C.8 six pilot cases were selected in which ante-operam analysis and intervention's design were carried out. Then, as explained in the paragraph "Problems encountered and solutions", interventions were carried out only in five schools, with infrastructural costs greater than expected (with no variations to the EC contribution request). Finally, more objectives than planned have been achieved (more pilot areas were investigated and more interventions were implemented).

### **4.1.9 Action C.9 – Action leader BILBAO**

#### Brief description and objectives

Action C.9 aimed at selecting case studies (urban and peri-urban quiet areas) in Bilbao and at implementing alternative solutions as interventions.

#### Expected results (Quantitative information)

- D8-Map with the selected and delineated quiet (urban) areas in Bilbao with noise levels in LDEN and LNIGHT and if available other data – ante-operam
- D9-Report on 1st survey done among stakeholders/visitors
- Report to developers methodology for improvement of the analysis methodology
- Management and maintenance plans documents approved for each quiet area.

#### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>                                      | <b>What has been done</b>  |
|--|--|
| Selection of case studies (urban and peri-urban quiet areas) in the city of Bilbao | Pilot cases definition and identification (2 pilot cases).   |
| D8-Ante-operam noise maps  | Maps with the selected and delineated quiet (urban) areas in Bilbao with noise levels in LDEN and LNIGHT have been supplied. See D8. |
| D9-Report on 1st survey done among stakeholders/visitors                           | See D9.  |
| Interventions realization  | Maintenance activities in the periurban area and a renewal of the square have been carried out. For further details, see D12.        |
| Report to developers methodology for improvement of the analysis methodology.      | See D9.  |
| Management and maintenance plans documents approved for each quiet area.           | See D9.  |

Maintenance activities in the periurban area:





Figure of the second phase of the intervention.

Figure of the area just about to be opened after the public works:

After the renewal of the area, the General Latorre square includes all the elements described in the project for the intervention.

Here some photos of the square after the renewal are presented:



#### Problems encountered and solutions

None, according to information provided by the partners Bilbao and Tecnalía.

#### **4.1.10 Action C.10 – Action leader BRUITPARIF**

##### Brief description and objectives

This action aimed to perform internal harmonization among the different proposed design solutions with special regard to the possibility of generalizing them at EU and international levels. The goal is to remove localities as much as possible from design solutions making them easily and directly portable to other countries.

### Expected results (Quantitative information)

Validation at EU and International level of:

- methodology for preliminary selection of urban quiet areas
- methodology for criticality analysis using both quantitative and qualitative approaches, including citizens and stakeholders involvement
- D11-1 Report about design internationalization
- list of suggestions and warnings for the solution developers that can be transferred to a specific part of the project resulting guideline.

### Actual results (What and How)

| Tasks foreseen in the Project proposal                                       | What has been done   |
|--|--|
| Validation of the methodology for selection, analysis and management of QUAs | Consultation of French Stakeholders in two steps to assess the approach and the proposed interventions with respect to its transferability. The first one was about the general aspects of the first version of the approach and was organized at the beginning of 2014. The second one was aimed to present the optimized methodology and the Project guidelines and was held on March 2015. The analysis phase of the optimized methodology with finalized tools was tested on one pilot case in Paris region. |
| D11- 1 Report about design internationalization                              | It was produced and delivered to the Coordinating beneficiary in February 2015. See D11.   |
| List of suggestions and warnings for the solution developers                 | Analysis of whether the Quadmap approach is in line with the recommendations of both the EEA guide and the National French guide from Faburel and Gourlot.   |



### *Consultation of French Stakeholders*

During the many contacts and discussions with representatives (technical staff and elected officials) from local authorities, we have seen that the issue of quiet areas remains an important subject. Although there are questions on identifying and characterizing sites, the main challenge appears to be the management of these areas and concrete actions for preserving them. For this reason it seems that the actions carried out by the towns of Florence, Bilbao, and Rotterdam will play a very important role in showing that it is possible to take action on this issue and give authorities the desire to address it.

For the first workshop with French stakeholders, it was considered premature to rigorously evaluate the identification and characterization methods prepared in the project, since the interventions realization in Florence, Bilbao, and Rotterdam was not completed yet. However, we have envisaged an overall evaluation: to roughly evaluate if the new methods were going in the right direction with respect to the local authorities. The workshop was held on 21 January 2014, in a big hall in the ASIEM (Paris, 7th arrondissement). Bruitparif, which organized the event and sent out the invitations to its members in particular, entrusted the hosting and the reporting of the event to the Atelier Politopie team. A satisfactory number of participants were present: 22 participants + Miriam Weber (DCMR - Rotterdam) The 22 participants in detail: 14 people working for local authorities in the IDF region, 5 working for an agglomeration community in IDF, 1 with the Departmental Council, and 2 from other organizations (ARS and CEREMA).

The Second workshop was made the 6 March 2015 after the finalization of the report of the action C10 and after the final Event and the final optimization of the methodology and the guide. As request by the participants of the first workshop, we presented for this second event the optimized methodology, the detailed and final tools proposed and we shared the results of the assessment of the different interventions realized in the different pilot cases of cities partners of the project.

### *Test of the implementation of the analysis phase of the optimized methodology with finalized tools on one pilot case in Paris region.*

The experimentation took place after the last project's meeting of May 2014. This meeting provided an optimized methodology and finalized tools. The area chosen for the experimentation was "bassin de la Villette". The interest of the place chosen is that Bruitparif already possessed knowledge of the site. Some data already collected have been reused. The user surveys and complementary measurements have been conducted in June and July.

10.3 Analysis of whether the Quadmap approach is in line with the recommendations of both the EEA guide and the National French guide from Faburel and Gurlot

As request by partners, Bruitparif has starting to compare the recommendation of the EEA guide and the approach proposed in the Quadmap project. We have also getting view of Nathalie Gurlot the co-writer of the National French guide about the Quadmap approach and tools. It can be concluded that it is entirely possible to transfer the methodology to other countries. The guide and tools are operational and meet the needs of future users. However, to facilitate the dissemination of the guide and the appropriation of the tools, it appears necessary to translate it into the various languages of the future users. A lot of work on semantics must be done in order to preserve the meaning of the words used and, in particular, for the tools such as the user questionnaire. The pilot cases carried out in the project's three cities could not be fully assessed under the C10 action due to delays in implementing works. However, the challenge for them is different. Indeed, these practical cases should be considered as good examples and not as templates to reuse systematically. At the workshop of 21 January 2014, the participants perfectly demonstrated their capacity to invent and innovate to find solutions for the case study during the third part of the workshop: "the

recommendation game”. In this sense, it is not necessary to strictly assess the transferability of the pilot cases but it was interesting to see how the scope for possible action was widened by looking at these examples. In complement, new tools have been developed to better inform and share information in France and Europe about interventions in the pilot cases:

- Initiative sheets to disseminate and publicize the “initiatives” carried out from pilot cases. Fact sheets are published on the NOISEINEU website of the Life Harmonica project: [www.noiseineu.eu](http://www.noiseineu.eu).

- Educational sound maps with audio recordings to “visit” the pilot cases and the interventions carried out with your ears.

Finally, it is important to bear in mind that, although future users expect a very precise "turnkey methodological guide", especially to meet the urgent need to implement environmental noise action plans, they remain attached to the possibility of taking ownership of them and adapting them as they see fit, depending on the town/site. In addition, they would therefore only use it as a "reference guide" with possible tools to use and good examples. The second workshop was previously scheduled for the final quarter of 2014, the purpose being to evaluate the use of finalized tools and the results of the interventions in the different pilot cases. The final report was transmitted to UNIFI at the beginning of February 2015.

In parallel, Bruitparif provides help and support for partners of the project on technical aspects for the improvement of several methods:

- Explanation and details on the method using the GIS, which allows the identification of areas with significant “acoustic contrast” within a town

- Explanation and details on the new CNI in order to calculate it as part of long-term measurements.

- Proposition for the use of long-term measurement to find the more representative period of time to do the user survey and the sound recording.

### Time schedule

Action C.10 started on 1st January 2013 and had a total duration of 27 months. It was concluded in March 2012 with a delay of about three months with respect to the deadline established after the approval of the project amendment. Following the Gantt chart of the Action C.10.

| Action                  | 2012 |    |     |    | 2013 |     |     |    | 2014 |     |   |    | 2015 |    |
|-------------------------|------|----|-----|----|------|-----|-----|----|------|-----|---|----|------|----|
| Number of Action        | I    | II | III | IV | I    |     |     | II | III  | IV  | I | II | III  | IV |
|                         |      |    |     |    | I.1  | I.2 | I.3 |    |      | MTR |   |    |      |    |
| C10 (original proposal) |      |    |     |    |      |     |     |    |      |     |   |    |      |    |
| C10 (actual)            |      |    |     |    |      |     |     |    |      |     |   |    |      |    |

Since the second of the foreseen workshops was organized on the 6<sup>th</sup> of March 2015, action C.10 has been concluded with an additional delay of 3 months behind the new deadline (December 2014) established after the approval of the Project amendment. This was due to the necessity of waiting for the completion of the remaining actions related to the methodology optimization and to the post-operam data analysis, in order to present the very results of the project during the workshop.

### Problems encountered and solutions

Not a real problem encountered, simply in order to adapt activities of Action C.10 to the modified schedule of the related Actions of the project. With the extension of the project with 6 months formally accepted in last September 2014, it was possible to address the situation.



#### 4.1.11 Action C.11 – Action leader VIENROSE

##### Brief description and objectives

Action C.11 was aimed at the planning and accomplishment of different interventions and ante/post-operam data acquisition and surveys for the city of Florence to test the methodology according to action B.6 results.

##### Expected results (Quantitative information)

- Implementation of the measures/interventions;
- Report on experiences gained after implementation of the interventions;
- D10- Maps with the selected and delineated quiet (urban) areas in Florence with noise levels in  $L_{DEN}$  and  $L_{NIGHT}$  and if available other data – post-operam;
- Report on the conclusions about the improvement achieved by both the management activities and the intervention;
- D12- 1 Report on 2<sup>nd</sup> survey among stakeholders/visitors;
- Training materials to be used for increasing awareness of municipal technical staff and for sharing the findings of the project.

##### Actual results (What and How)

| Tasks foreseen in the Project proposal  | What has been done  |
|---|---|
| Implementation of the measures/interventions  | After preliminary analysis, the interventions' design has been carried out. See Action D.12.      |
| Report on experiences gained after implementation of the interventions  | See D12.  |
| D10-Post-operam maps  | Maps produced, see D10.   |
| Report on the conclusions about the improvement achieved by both the management activities and the intervention                 | See D12.  |
| D12-Report and 2 <sup>nd</sup> survey among stakeholders  | Report produced, see D12.   |
| Training materials to be used for increasing awareness of municipal technical staff and for sharing the findings of the project | Training materials have been produced and distributed during editions of the Noise Awareness day. |

Manzoni Ante Operam measurements / questionnaires

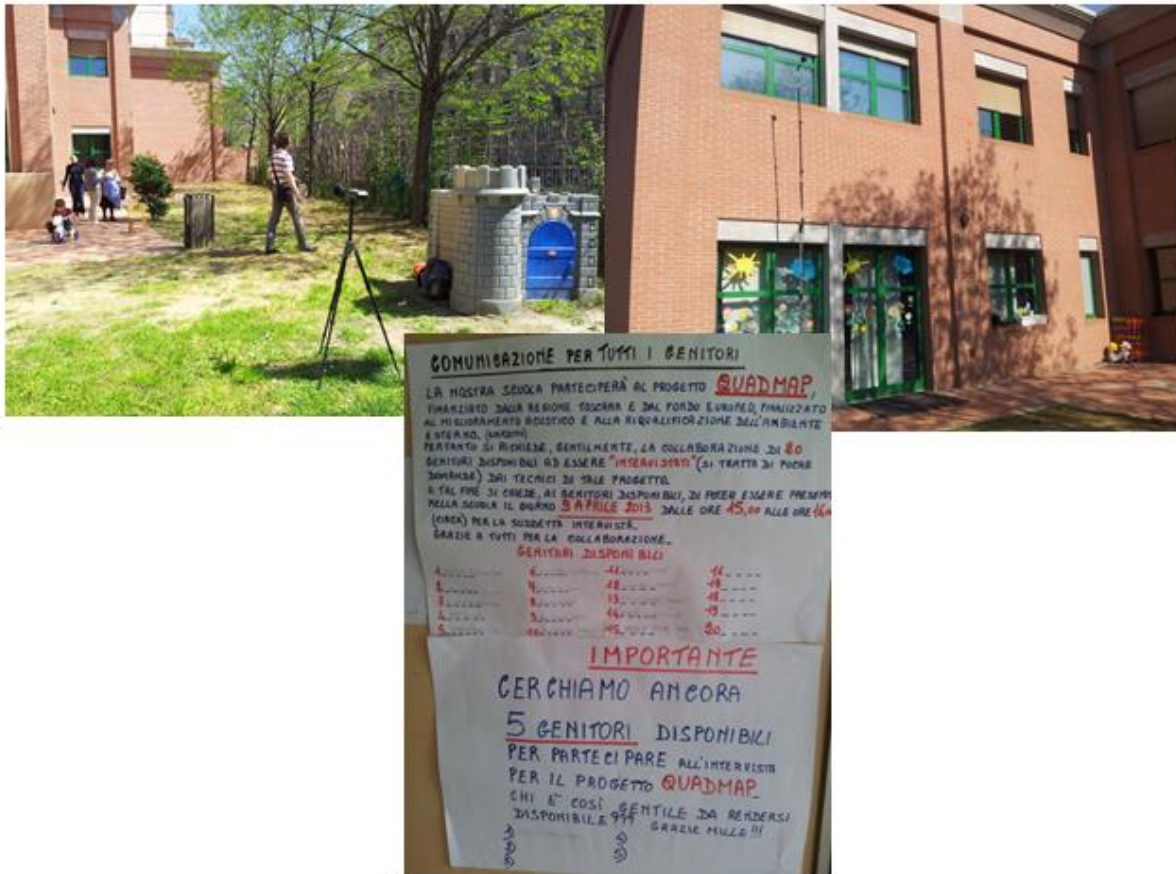


Dionisi Ante Operam measurements / questionnaires



Vamba Ante Operam measurements / questionnaires





Pio Fedi Ante Operam measurements / questionnaires





De Filippo Ante Operam measurements / questionnaires



Paolo Uccello Ante Operam measurements / questionnaires





De Filippo post operam



Manzoni post operam



Vamba post operam



## Dionisi post operam



Carried out activities are summarized below.

- Pilot cases definition and identification (6 pilot cases)
- Analysis of green areas;
- Definition of HUAs;
- Meetings with schools contact persons for the explanation of the project and obtaining authorizations to perform acoustic measurements and questionnaires to children, parents, teachers;
- Ante operam Monitoring campaigns according to the method defined in action B6 (short measurements, long measurements, sound walks and interviews) in the 6 pilot cases, according to the time scheduling shown below:

| School   | Contact person                         | Starting date of noise monitoring (year 2013) | Ending date of noise monitoring (year 2013) | Date of interviews (year 2013) |
|--|--|---|---|--------------------------------|
| SCUOLA PRIMARIA E.DE FILIPPO E SCUOLA DELL'INFANZIA VIA DE'BASSI<br>Via de' Bassi, 3 | PRESIDE MARCO MENICATTI                | 28 February                                   | 7 March                                     | 4-5-6-7-8 March                |
| SCUOLA SECONDARIA I GRADO A. MANZONI<br>via Gemignani,3                              | PRESIDE POLI FABRIZIO                  | 21 March                                      | 28 March                                    | 22-23-24-25 March              |
| SCUOLA SECONDARIA I GRADO P.UCCELLO<br>Via Golubovich, 4                             | PRESIDE CARLO TESTI<br>PROF.SANTI      | 14 March                                      | 21 March                                    | 12-13-14-15-16 March           |
| SCUOLA DIONISI<br>Via Aretina  | COORDINTRICE SCOLASTICA STEFANIA SARTI | 3 April                                       | 10 April                                    | 9 April                        |

| School                                 | Contact person                     | Starting date of noise monitoring (year 2013) | Ending date of noise monitoring (year 2013) | Date of interviews (year 2013) |
|--|------------------------------------|---|---|--------------------------------|
| VAMBA<br>Via Torre degli Agli          | PRESIDE<br>PROF.SSA<br>LEDA BRUNI  | 12 April                                      | 19 April                                    | 12-15 April                    |
| SCUOLA DELL'INFANZIA<br>Via Pio Fedi,2 | MARCIANO<br>CATELLO<br>(Comune FI) | 2 May   | 9 May                                       | 6-7 May                        |

- Ante operam Questionnaires submission in the 6 pilot cases, according to the time scheduling above shown:

| ID QUA | QUA NAME                     | HUA NUMBER | QUESTIONNAIRES NUMBER |
|--------|------------------------------|------------|-----------------------|
| 01     | "E. De Filippo" School       | 2          | 91                    |
| 02     | "P. Uccello" School          | 2          | 100                   |
| 03     | "A. Manzoni" School          | 2          | 71                    |
| 04     | "F.Dionisi" School           | 1          | 36                    |
| 05     | "M. Montessori/Vamba" School | 2          | 80                    |
| 06     | "P. Fedi" School             | 1          | 55                    |

- Preliminary intervention design (delivered as draft version on June 2013), according to interviewed people suggestions as well as to the objectives of noise reduction.
- Designs submission to bodies and authorities (Regional Agency for Environment, Landscape Commission, Local Health Unit) competent to give binding required observations for formal designs approval. Got in September 2013.
- Delivery of final designs, which incorporated the observations of the supervisory bodies.
- Design revisions according to the further requests of Coordinating Beneficiary and delivery of detailed designs:
  - 1<sup>st</sup> on March 2014 (for De Filippo and Dionisi schools)
  - 2<sup>nd</sup> on March 2014 (for Vamba Montessori and Manzoni schools)
  - 3<sup>rd</sup> on April 2014 (for Pio Fedi school)
  - 4<sup>th</sup> on May 2014 (for Pio Fedi school)
- Assistance to Coordinating Beneficiary in the phase of coordination with work contractors and participation in many meetings for variation during work realization.
- Validation and asseveration of compliance to project's specifics of noise reduction systems and products
- Assistance to the Direction of Works in all pilot cases, being present in the construction sites during all the construction phases.
- Monitoring campaigns according to the method defined in action B6 (post operam short measurements, long measurements, and interviews) in the 6 pilot cases, according to the time scheduling shown below:

| School  | Contact person             | Period of noise measurements / monitoring | Date of interviews |
|---|----------------------------|---|--------------------|
| SCUOLA PRIMARIA<br>E.DE FILIPPO E SCUOLA<br>DELL'INFANZIA VIA | PRESIDE MARCO<br>MENICATTI | 11/12/2014-<br>12/1/2015                  | 12/1/2015          |

| School   | Contact person                               | Period of noise measurements / monitoring | Date of interviews |
|--|--|---|--------------------|
| DE'BASSI<br>Via de' Bassi, 3                               |  |   |                    |
| SCUOLA SECONDARIA I GRADO<br>A. MANZONI<br>via Gemignani,3 | PRESIDE POLI<br>FABRIZIO                     | 11/12/2014-<br>13/1/2015                  | 13/1/2015          |
| SCUOLA DIONISI<br>Via Aretina                              | COORDINTRICE<br>SCOLASTICA<br>STEFANIA SARTI | 9/12/2014-<br>14/1/2015                   | 14/1/2015          |
| VAMBA<br>Via Torre degli Agli                              | PRESIDE PROF.SSA<br>LEDA BRUNI               | 12/12/2014-<br>15/1/2015                  | 15/1/2015          |

- Post operam questionnaires submission in the 6 pilot cases, according to the time scheduling shown below:

| ID QUA | QUA NAME                     | HUA NUMBER | QUESTIONNAIRES NUMBER |
|--------|------------------------------|------------|-----------------------|
| 01     | "E. De Filippo" School       | 2          | 55                    |
| 03     | "A. Manzoni" School          | 2          | 65                    |
| 04     | "F.Dionisi" School           | 1          | 36                    |
| 05     | "M. Montessori/Vamba" School | 2          | 74                    |

#### Time schedule

Action C.11 started on 1st January 2013 and had a total duration of 25 months. It was concluded on January 2015 with a delay of 1 month with respect to the deadline established after the approval of the project amendment. Following the Gantt chart of the Action C.11.

| Action                  | 2012 |    |     |    | 2013 |     |     |    |     |     | 2014 |    |     |    | 2015 |     |     |    |
|-------------------------|------|----|-----|----|------|-----|-----|----|-----|-----|------|----|-----|----|------|-----|-----|----|
| Number of Action        | I    | II | III | IV | I    |     |     | II | III | IV  | I    | II | III | IV | I    |     |     | II |
|                         |      |    |     |    | I.1  | I.2 | I.3 |    |     | MTR |      |    |     |    | I.1  | I.2 | I.3 |    |
| C11 (original proposal) |      |    |     |    |      |     |     |    |     |     |      |    |     |    |      |     |     |    |
| C11 (actual)            |      |    |     |    |      |     |     |    |     |     |      |    |     |    |      |     |     |    |

The occurred delay was due to delays in intervention realization (partner FIRENZE). However, it was considered acceptable because the action ended in time to permit the data analysis and completion of guidelines within the final event in February 2015.

#### Problems encountered and solutions

Till September 2013, no major problems have been encountered. The only relevant aspects to be taken into account are that the work than planned in the project proposal nearly doubled. So, an agreement with the partner FIRENZE has been taken, establishing that some of the activities that were originally in charge of partner VIE will be carried out by FIRENZE partner.

In particular, the structural design actions, safety coordination during the construction phase and the direction of the work were performed at no additional cost for the project, from FIRENZE partner with its own resources. IE partner handled all pre-post-operam noise activities (according to method deriving from action B6) for the 6 pilot cases as well as all



activities connected with architectural and acoustic design of all interventions as well as questionnaires submission.

That's why a new system of noise acquisition, consisting of two Sound meter levels - hand-held analyzer (and annexed consumable materials) has been purchased to respect timetable.

Tax regime in Italy changed starting from 1st October 2013; this led the necessity to update costs tables of all the projects, making them conform to the new tax regime (VAT increased from 21% to 22%). So a new revision of the projects was necessary and has consequently been produced to be delivered for the tenders, this also causing some time to be spent for update, print and approve designs.

During the period October 2013-March 2014, some problems arose due to particular and unexpected requests by the School Managers, demanding projects updating to accomplish to Schools needing's and requirements, in particular linked to organization of construction sites and timing of the implementation of interventions, asking to realize them during the period of schools holidays.

In the period April 2014-September 2014 some other problems arose:

- due to some delay in bureaucracy issues, with special reference to public tenders publication and implementation (some tenders have been published twice, because first time no competitor failed to show up)
- due to unexpected interferences, during construction phase, with underground urban services
- to the weather conditions, that caused delays in the construction timetables

In the period September 2014-December 2014 interventions have been realized and in January 2015 post operam measurements campaigns and questionnaires submission have been performed, with no major problems and good results in terms of people satisfaction and noise mitigation.

Mention any complementary action outside LIFE

See Action C.8.

#### **4.1.12 Action C.12 – Action leader TECNALIA**

##### Brief description and objectives

Action C.12 was aimed at the planning and accomplishment of different interventions and ante/post-operam data acquisition and surveys for the city of Bilbao to test the methodology according to action B.6 results.

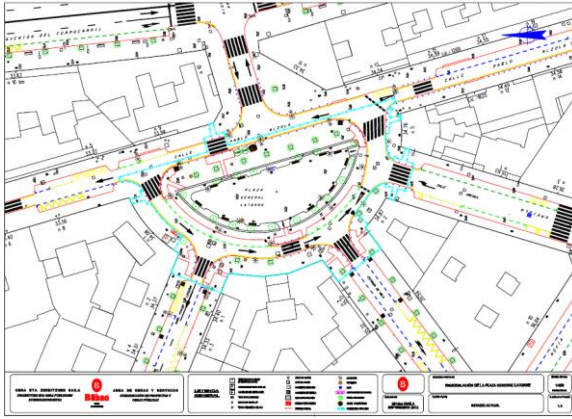
##### Expected results (Quantitative information)

- Results of the first exercise with the methodology;
- D10- Maps with the selected and delineated quiet (urban) areas in Bilbao with noise levels in  $L_{DEN}$  and  $L_{NIGHT}$  and if available other data – post-operam;
- D12-1 Report on 2nd survey among stakeholders/visitors;
- Report to developers methodology for improvement of the methodology.

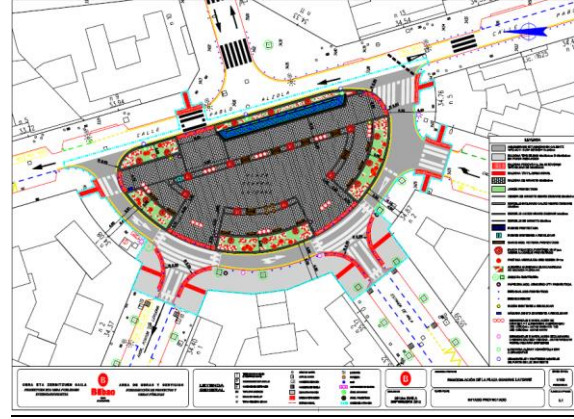
As this action is linked to actions C.9 and D.13, results obtained in those actions are partially results of this action.

##### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>   | <b>What has been done</b>  |
|---|--|
| Task 1: initial assessment of the quality of quiet areas.   | <p>The proposed methodology has been applied in General Latorre square (action C9), one of the two pilot cases selected in Bilbao: the initial existing scenario was assessed.</p> <p>All the needed input data were collected and analyzed according to the proposed methodology.</p> <p>These results have been presented to the Commission in Bilbao and some ideas for intervention (post operam scenario) were selected.</p> <p>In the case of the second pilot area in Bilbao (in connection with the Green Corridor), the area for intervention was decided, the methodology has been applied in May 2013 and results of the data processing have been developed in June 2013. In this second pilot case, a special effort regarding the data analysis was needed considering the special characteristics of this area.</p> |
| Task 2: post-operam assessment of the quality of the quiet areas.                                       | <p>For the post-operam assessment, an external assistance is required especially in the Green Ring area. This External assistance has provided useful information regarding the influence of biodiversity in creating Quiet Areas in Urban surroundings. The post-operam analysis was developed during May 2014 and the data were post processed during June 2014.</p>   |
| D10-Post operam maps  | See D10.   |
| Task 3: analysis of the benefits achieved by the operative actions executed in the Bilbao case studies. | <p>Analysis of the benefits achieved by the operative actions executed in the Bilbao case studies. Conclusions about the benefits of the actions in terms of quietness were developed in coordination with Bilbao municipality.</p>  |
| D12-1 Report on 2nd survey among stakeholders/visitors  | See D12.   |
| Task 4: cooperate in discussion and decision making for methodology optimization.                       | <p>For the cooperation in the discussion and decision making for the methodology optimization, a meeting in Florence was celebrated on 20th February. In the minutes of this meeting, the conclusions and actions that were defined to go deeply in the optimization are analyzed. Also in the conclusions of the post operam data an analysis of the applicability of the methodology to assess quietness and to compare different situations is developed.</p>   |
| Results of the first exercise with the methodology.   | See D9.  |
| Report to developers methodology for improvement of the methodology.                                    | See D12.   |



*General Latorre Square: initial situation.*



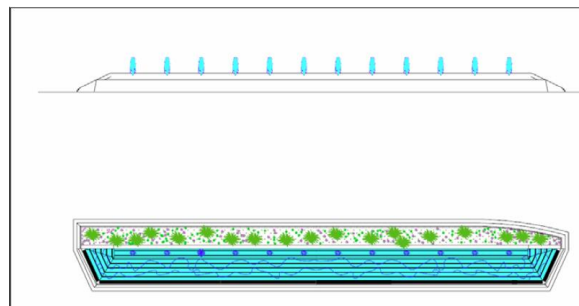
*General Latorre Square: project.*



*Appearance of the fountain to be integrated in the General Latorre square*



*Description of the final situation of the project.*



*Detailed description of the fountain to be integrated in the project.*

On the other hand, regarding Santa Marina (periurban area), the action carried out consists in a selective tree thinning of non-autochthonous plants: *Pinus Pinaster* that was developed during February 2014.

To describe the action two different subareas are defined.



Fig. A. Cut trees in the subarea A after the action.



Fig. B. Cut trees in the subarea B after the action.

In the subarea A 29 trees were cut and in subarea B 24. A total of 53 trees were cut. After this action the tree density in subarea A happened to be 210 trees/ha to be 198 trees/ha and in the subarea B happened to be 242 trees/ha to be 329 trees.

#### Problems encountered and solutions

None.

### **4.1.13 Action D.13 – Action leader UNIFI**

#### Brief description and objectives

Action D.13 was aimed at validating the data acquisition procedure carried out in the early ante-operam step and to optimize the methodology by using pilot cases results.

#### Expected results (Quantitative information)

D13-1 Report on final optimized methodologies and their applications limits (if any).

D14- 1 set of final toolkits

#### Actual results (What and How)

| Tasks foreseen in the Project proposal   | What has been done  |
|--|---|
| Task 1: analysis methodology check and optimization.                                       | A first data check has been obtained. All encountered difficulties in parameter collections have been considered and discussed with other partners. For problematical parameters, new substitutes or integrations have been defined.  |
| Task 2: management (strategic and direct actions) methodology optimization and evaluation. | New carried out parameters have been defined in order to be applied for the final redesign of QUAs. Citizens' perceptions have been retrieved in post-operam as well as noise measurements, in order to evaluate the effectiveness of the proposed approach. A post-operam revision of the approach has been developed. |
| D13-1 Report on final optimized methodologies and their applications limits (if any).      | See D13.  |
| D14- 1 set of final toolkits   | See the project's guidelines (D14).   |

Firstly, UNIFI recognized the lacks/incompleteness of the applied methodology from its application to the pilot cases selected in Florence (see Actions C.8 and C.11).

Subsequently UNIFI analysed data collected in Florence in order to learn more about possible interaction between the several acquired variables and suggest different variables/criteria to be introduced.

In the period from October 2013 to March 2014, analysis already carried out on data obtained in Italian pilot areas were applied also to data collected by DCMR in two public parks and by TECNALIA in a square and in a peri-urban area. On the 26th November 2013 an internal Project meeting was held in Bilbao, in order to present the Mid Term Report and discuss about the ante-operam data collection and analysis. Then additional procedures of analysis were agreed with the other partners and completed for data collected in all the ten pilot areas. Results obtained were discussed during the last project meeting held in Florence in February 2014 and minor corrections and further analysis were agreed among partners. UNIFI provided with last results in April 2014.

By the end of 2014, interventions in all pilot cases were fully implemented. Between October 2014 and January 2015 post-operam data have been collected and analysed in all pilot cases in order to complete the final version of the methodology, with specific attention to the management phase. In addition, guidelines and tool kits about the optimized methodology have been prepared and presented during the final event organized in Rotterdam on 19-20 February 2015.

#### Time schedule

Action D.13 started on March 2013 and had a total duration of 24 months. It was concluded on February 2015 with a delay of two months with respect to the deadline established after the approval of the project amendment. Following the Gantt chart of the Action D.13.

| Action                  | 2013 |     |     |    |     | 2014 |   |    |     | 2015 |     |     |     |    |
|-------------------------|------|-----|-----|----|-----|------|---|----|-----|------|-----|-----|-----|----|
| Number of Action        | I    |     |     | II | III | IV   | I | II | III | IV   | I   |     |     | II |
|                         | I.1  | I.2 | I.3 |    |     |      |   |    |     |      | I.1 | I.2 | I.3 |    |
| D13 (original proposal) |      |     |     |    |     |      |   |    |     |      |     |     |     |    |
| D13 (actual)            |      |     |     |    |     |      |   |    |     |      |     |     |     |    |



The initial delay for the beginning of Action D.13 was due to the late end of Action B.6. Then, a six months extension of the Project has been requested and accorded by the EC. As a consequence, action D.13, which originally was expected to end by June 2014, was supposed to be concluded with a six months delay accordingly. Actually, the action was completed in February 2015 with a little additional delay occurred due to some post operam data collected by partners in January 2015. However, the action ended in time to make the guideline ready for the final event held in February in Rotterdam.

#### Problems encountered and solutions

None.

#### Continuation of the Action after the conclusion of the Project

See section 5.4.

## 4.2 Dissemination actions

### 4.2.1 Objectives

The Dissemination Plan will be defined at the end of the first project year, in order to identify and maximize the impact of the dissemination activities during the project years. Each of the partners was involved as organisers or co organisers of major events.

In general, the activities composing the “Dissemination” Action are listed below:

- Creation of a Dissemination Plan (in the first year of the Project)
- Publication of Notice boards, describing the project, accessible to the public
- Implementation (See action A.2) and continuous update of the project web site, as well as of the forum for networking activities
- Scientific publications on journals and conference proceedings
- Layman’s Report
- Organization of visits at project sites of: general public, students, authorities, political decision makers, etc.
- After-LIFE Communication Plan, communicating the project plans to continue disseminating all results after the end of the project.

Agreed by all partners, the Dissemination Plan (see Annex 5) ensured a proper dissemination of the above listed products in the most effective way.

### 4.2.2 Dissemination: overview per activity

See Annex 5.

All dissemination actions (E.14-E20) started in the first period of 2012 instead of in the second one, as foreseen in the original proposal. This modification occurred because the first occasion of dissemination happened in January 2012 with the event held in Florence. The dissemination activities were all concluded concurrently with the Project end within March 2015 with respect to the deadline established after the approval of the 6 months extension of the Project.

According to the project proposal, dissemination activities will be carried out also after the conclusion of the project according to the After Life communication Plan (see D16). Moreover, the Project website will be active for five years after the project conclusion.

For all dissemination actions expected results (in terms of quantitative information) are:

Free distribution of the methodology developed by QUADMAP and related toolkits by using the Project website and also by EAA - Documenta Acustica, EUROCITIES WG Noise website and viadesk and Proceedings of International Congresses on Acoustics.

#### 4.2.2.1 Action E.14 – Action leader UNIFI

##### Brief description and objectives

Action E.14 aimed at carrying out dissemination activities foreseen by Life+Common Provisions and at attending to scientific conferences and submitting scientific papers to Congresses and Scientific Publications.

##### Actual results (What and How)

| Tasks foreseen in the Project proposal  | What has been done  |
|---|---|
| web site uploading and updating in English  | All sections of the website have been translated in all partners' languages.  |
| setting up of 10 noticeboards describing and publicizing the project  | UNIFI has built up Notice boards publicizing the Project and put them in strategic places.  |
| 2 person being present with presentation of scientific papers in an International Congress on Acoustics 2013-2014 attendees: about 600-700 people | UNIFI staff has participated with VIENROSE to the writing of a paper entitled " <i>LIFE+2010 QUADMAP project - Quiet Areas Definition and Management in Action Plans: the proposed methodology and its application in the pilot cases of Firenze</i> " and submitted to Internoise 2013 congress (Innsbruck, Austria, September 2013).<br>The paper was presented by UNIFI and VIENROSE who both attended the congress. |
| 1 person being present with presentation of scientific papers in Internoise 2012 attendees: about 600-700 people                                  | UNIFI staff has participated to the writing of a paper entitled "quite areas definition and management in action plans: general overview" and submitted to Internoise 2012 congress (New York, USA, august 2012).<br>The paper was presented by DCMR staff who attended the congress.   |
| 2 persons being present with presentation of scientific papers attendees: about 200 people  | UNIFI staff has participated to the final event organized on 19 and 20 <sup>th</sup> February 2015 in Rotterdam with two presentations: the first one has been a Project overview and the second one a description of the several sections of the Project guidelines.   |
| 2 persons being present with presentation of scientific papers attendees: about 300 people  | UNIFI staff has participated to the workshop held in Florence on 19 <sup>th</sup> December 2014 with three presentations: the first one about the Project overview, the second one about the methodology proposed by the Project and the third one about analysis carried out on data collected in the pilot areas.   |
| publication of leaflet in English and its printing in 1500 copies to be distributed during final congress   | The leaflet has been agreed within all partners and published in English on the Project website. It will be distributed during the next meetings of EUROCITIES.   |
| at least 2 publication in international (reviewed) journals   | In the dissemination plan annexed to the Mid Term Report, at least 3 publications are considered more appropriated to give an added value to dissemination activities. At the meantime, based on the fact that LIFE+  |

| Tasks foreseen in the Project proposal   | What has been done   |
|--|--|
|  | <p>is not a research program, publications in Proceedings of International Congresses are considered more adequate than international (reviewed) journals.</p> <p>At the end of the project 5 papers has been published and 3 papers have been accepted for publication on proceedings of acoustic congresses that will be held in 2015.</p> <p>About reviewed publications, a reviewed paper has been accepted for the international congress on acoustics, ICSV22, that will be held in July 2015.</p> |
| organization for local and national policy makers of visit at project sites. about 15/20 people are foreseen | The visit to the Italian pilot cases has been organized, together with Firenze and Vie.En.Rose during the workshop held in Florence on 19 <sup>th</sup> December 2014.   |
| production of an handbook to be distributed via Eurocities to the 130 cities members                         | The handbook consists of a guideline and has been updated during the whole project duration. The final version has been completed and will be distributed via Eurocities.  |

#### Publications foreseen:

- 1) a paper at Internoise2012
- 2) a paper at Internoise 2013
- 3) a paper to AIA 2014 congress
- 4) a paper to the ICSV21 congress
- 5) a paper to Forum Acusticum congress.

#### Publications actually produced:

See Annex 5.

#### Problems encountered and solutions

None.

#### Mention any complementary action outside LIFE

Publications produced and attendances at congresses were more than expected.

### **4.2.2.2 Action E.15 – Action leader DCMR**

#### Brief description and objectives

Action E.15 was aimed at reporting to EUROCITIES network and to EU DG Environment and at attending to scientific conferences and submitting scientific papers to Congresses and Scientific Publications.

#### Actual results (What and How)

| Tasks foreseen in the Project proposal  | What has been done   |
|---|--|
| Informing and promoting among EUROCITIES members via meetings; presenting at INTERNOISE and EURONOISE; presenting at end congress; presenting at annual congress; informing cities in | During the autumn meeting of Working Group Noise EUROCITIES in Copenhagen which was presided by DCMR, some room for a QUADMAP presentation was made. The presentation was given by a representative of the city of Florence. Guidelines were sent to EUROCITIES office and |



| Tasks foreseen in the Project proposal                                  | What has been done  |
|---|---|
| Rotterdam Metropolitan Region; Sending methodology and outcomes to JRC. | they will distribute this to all European cities being member of EUROCITIES. After completing all translations of the guidelines a brief article will be published in the newsletter of EUROCITIES also containing a link to the various guidelines.  |
| Translate QUADMAP website in Dutch.                                     | <p>Website <a href="http://www.quadmap.eu">www.quadmap.eu</a> displays information on the project in Dutch and the website has been communicated through twitter, weblogs, LinkedIn. The website was updated with new information, such as conference papers and descriptions of the pilot projects, on the project. A page with information about the closing conference of QUADMAP was added to the website with also the presentations held at the closing conference. Also two links to instructive videos were added, see website.</p> <p>On order to give maximum attention to the QUADMAP closing conference also a Facebook page was made and several messages have been sent. On the website of DCMR attention and the DCMR newsletter International Hi-lites attention was paid to the closing conference (announcement of the closing conference) and also afterwards a brief message was published. Also numerous tweets were sent by Twitter.</p>  |
| Papers and participation to conferences                                 | <p>A paper was sent in and a presentation was given during the INTERNOISE2014 congress in Melbourne by DCMR.</p> <p>In December 2014 was participated in the workshop on QUADMAP in Florence and contributed by presiding a round table and giving an interview for a local TV station.</p> <p>Abstracts and presentations have been prepared and submitted for EuroNoise 2015 in Maastricht and the Dutch conference on Noise, Vibration and Air Quality (November 2014). And at the ICBEN conference 2014 in Nara, Japan, QUADMAP has been presented as well. All presentations given are available at the project website.</p> <p>A paper on QUADMAP and research on quiet urban areas in Rotterdam has been written in cooperation with the Dutch Institute on Public Health and the Environment (RIVM), and has been published in the Dutch Journal on Noise (Kluwer Publisher, Alphen ad Rijn).</p> <p>Various papers/conference proceedings such as the paper for the ICBEN 2014 conference in Nara, Japan, and the Dutch conference on Noise, Vibration and Air Quality in November 2014 have</p> |

| Tasks foreseen in the Project proposal       | What has been done  |
|--|---|
|  | been produced, a research paper was published in the Dutch journal on Noise and the Internoise 2015 paper was produced.   |
| Organization of the final project conference | <p>The closing conference's program has been prepared, speakers are invited and most have accepted and confirmed their participation. Through several mailings, website communication, twitter and LinkedIn participants from Europe are invited at the closing conference and the possibility to register. The closing conference was held on 19 and 20 February 2015 in Schiedam/Rotterdam at the DCMR building. About 100 attendees registered but due to illness only 85 participant showed up. A brief report of the closing conference can be found on the website.</p> <p>During the closing conference an interview was given by a DCMR representative to a local newspaper and also to a local TV station (TV Rijnmond).</p> |

#### Problems encountered and solutions

None.

### 4.2.2.3 Action E.16 – Action leader VIENROSE

#### Brief description and objectives

Action E.16 was aimed at attending to scientific conferences, submitting scientific papers to Congresses and Scientific Publications and organizing a workshop for dissemination of results in Italy.

#### Actual results (What and How)

For actual carried out activities, please see Annex 5.

| Tasks foreseen in the Project proposal                                | What has been done  |
|---|---|
| Scientific publications<br><br>Publications on local bodies magazines | <p><b>EXPECTED</b></p> <ul style="list-style-type: none"> <li>- 2 publications on RIA – Rivista Italiana di Acustica (edition of about 500 copies) were expected in the original proposal.</li> <li>- About 10 publications on different local bodies magazines (Arpatnews, magazines of Tuscany region and of different municipalities)</li> </ul> <p><b>REALIZED</b><br/>One publication on the RIA</p> |
| Participation in Eurocities conferences                               | <p><b>EXPECTED</b></p> <ul style="list-style-type: none"> <li>- 1 participant in 4 Eurocities meetings presenting state of the art of Quadmap project.</li> </ul> <p><b>REALIZED</b></p>  |

| Tasks foreseen in the Project proposal   | What has been done  |
|--|---|
|  | -   |
| Organization together with Firenze of a workshop fully devoted to Quadmap  | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- Organization together with Firenze of a workshop fully devoted to Quadmap</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul>   |
| Leaflet production   | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- 2 leaflets in national language describing: results of data collection, interventions realized</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul>  |
| Participation in yearly congresses of AIA (Acoustical Italian Association) being present with scientific papers      | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- 2 persons being present with presentation of scientific papers in 3 yearly congress of AIA</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul>  |
| Attending international conferences being present with scientific papers   | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- 1 person being present with presentation of scientific papers in Internoise 2012* attendees: about 600-700 people. As specified in the inception report, due to the limited number of surveys collected before the deadline to send the papers to New York Internoise 2012, it was considered appropriate not to participate, not having enough material to present strong scientific results of the A3 action.</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul> |
| Updating of Vie En.Ro.Se. website with a section devoted to Quadmap project  | <ul style="list-style-type: none"> <li>- On Vie En.Ro.Se. website (<a href="http://www.vienrose.it">www.vienrose.it</a>) all the news about Quadmap project have been published and regularly updated</li> </ul>  |
| Translation in Italian of Quadmap website  | <ul style="list-style-type: none"> <li>- Done</li> </ul>  |
| Participation in organization of open meetings to update citizens about state of the art on intervention building up | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- audience in each meeting (3 – 4 meetings foreseen): about 200 people at least - leaflets distribution; noticeboards setting up where posters will be exposed</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul>  |
| Attending final congress organized by Dcmr   | <b>EXPECTED</b> <ul style="list-style-type: none"> <li>- 2 persons being present with presentation of scientific papers attendees: about 200 people are foreseen</li> </ul> <b>REALIZED</b> <ul style="list-style-type: none"> <li>-</li> </ul>   |

\* In the proposal this is mistakenly indicated as “Internoise 2014”

Activities carried out besides the previsions are reported in Annex 5.

#### Problems encountered and solutions

In the first period, due to the limited number of surveys collected before the deadline to send the papers to New York Internoise 2012, it was considered appropriate not to participate, not having enough material to present strong scientific results of Action A.3. However, additional dissemination activities were carried out by attending at a workshop in Brighton Workshop- Exploring practical methods for assessing and improving soundscapes.

Then only some small variations compared to the original proposal have been proposed, with the aim of making the dissemination activities more effective.

Finally some additional activities respect to what foreseen have been carried out.

#### Mention any complementary action outside LIFE

Publications produced and attendances at congresses were more than expected.

#### **4.2.2.4 Action E.17 – Action leader TECNALIA**

##### Brief description and objectives

Action E.17 was aimed at attending scientific conferences and submitting scientific papers to Congresses and Scientific Publications.

##### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>                                    | <b>What has been done</b>   |
|--|---|
| organization together with Bilbao of a workshop devoted to quadmap               | 1 workshop focused to developed interventions will be devoted to citizens and local policy makers. The entrance will be free and the events will be located in places that can guest 300 people at least. (27 November 2013)  |
| Translation in español of website  |   |
| Participation in yearly congress of tecniacustica                                | 1 person being present with presentation of scientific papers in 3 yearly congresses of tecniacustica.<br>attendees: about 300-400 people<br>2012, 2013, 2014   |
| Participation in yearly congress on acoustic al European or International level. | 1 person being present with presentation of scientific papers in 2 yearly European or International Congress on acoustics<br>attendees: about 300-400 people<br>2012 and 2013.  |
| Publication on the Spanish acoustical technical magazine                         | 2 publications<br>(two SEA magazines publications)  |
| Publications on the local public bodies magazine                                 | 3 publications<br>2 in Media (Regional News paper)<br>1 in the Municipal magazine of Bilbao   |
| Collaboration with Bilbao in organization of citizens workshop                   | Audience in each meeting (3 – 4 meetings foreseen): about 200 people at least<br>Notice boards setting up where posters will be exposed.<br>- 2 meetings with neighborhood association representatives in General Latorre.<br>- 1 meeting with citizens (27 November 2013).<br>- workshops with citizens during 2014. |

Publications foreseen: 2 publication for a Spanish municipality magazine.

Publications actually produced are reported in Annex 5.

Problems encountered and solutions

None.

Mention any complementary action outside LIFE

Publications produced and attendances at congresses were more than expected.

#### **4.2.2.5 Action E.18 – Action leader BRUITPARIF**

Brief description and objectives

Action E.18 was aimed at attending scientific conferences and submitting scientific papers to Congresses and Scientific Publications.

Actual results (What and How)

##### ***Foreseen Action objectives***

###### *National Level*

Information on the project's result provided at national level during a conference in Paris organized with the Regional Council of Ile de France, fully devoted to QUADMAP dissemination results:

- indicatively at the end of 2014, to present in France :
- procedures and methods used to select/analyse/manage from different point of view Quiet Areas;
- regarding pilot quiet areas in the City of Florence, Bilbao and Rotterdam, results of data acquisition to test the methodology.
- a translation into French of the website, the final document and technical documents to use the methodology and documents for the public, if this translation is not integrated in the coordinator's project.

###### *Local Level*

- Special workshop at the beginning of 2014 about the project QUADMAP in the Forum of the Ile-de-France Entities for a better management of the sound environment. The forum is for all partners towns in the Paris regions. The forum is a physical space where working groups, seminars and conferences are held, this forum will also take the form of a dematerialized space, resource place and exchange centre on the BRUITPARIF website.

Creation of a link with QUADMAP website on BRUITPARIF website ([www.bruitparif.fr](http://www.bruitparif.fr)), and news of the project regularly published and updated.

The work of translation in French or in English of the different documents of the project is inside this action, together with the dissemination work for the project and contacts with the media.

##### ***Achieved Action objectives***

###### *Dissemination at national level*

Participation on 24th January 2012 a workshop URBAN NOISE MANAGEMENT Symposium, Workshop on HUSH, NADIA and QUADMAP Life+ Projects, held at Palazzo Vecchio, in Florence.

The 28 November 2012, Bruitparif hosted the QUADMAP meeting for partners in the office of the noise observatory. In the framework of the conference in Paris on noise management organized by Bruitparif the 29 November, the Quadmap project was network with other project as harmonica.

On the 23th of January 2013 Bruitparif participated to the meeting with partners in Brussels hosted by Eurocities.

Organization and preparation of all documents in French for the workshop of the 21 January 2014. Invitation, Article in the newsletter, the different ppt presentations about the Quadmap approach and the three pilot cases.

Linking with the Harmonica project: News about Quadmap project was published on the home page of the Harmonica project website

Two initiatives from the Quadmap project are published on the new website: [www.noiseineu.eu](http://www.noiseineu.eu) from the Harmonica project. The initiative from the city of Firenze with several interventions and innovative design solution to protect outside areas in the primary schools and the initiative from the city of Bilbao to create a sonic island on the General La Torre square, an area with a significant amount of road traffic. The initiative of the city of Rotterdam will be available on the website [www.noiseineu.eu](http://www.noiseineu.eu) very soon. This online publication is a good opportunity to promote both the intervention carried out in the cities partners and the Quadmap project.

Participation and contribution to the closing conference of 19 and 20 February in Rotterdam.

A second workshop was organized the 6 March 2015 after the closing conference on 19 and 20 February in Rotterdam with the agreement of all partners, and with the extension of the project with 6 months formally accepted in last September 2014. To increase the dissemination of the project in France, a dedicated event at national level with all documents and presentations about Quadmap translated into French was organized. The language of the event was French.

#### *Dissemination at local level*

The project Quadmap was presented in five meetings of the “forum des acteurs” in Bruitparif office, 21 Jun 2012, 20 September 2012, 14 February, 24 April 2013 and 4 July 2013 24 September 2013, 19 December 2013 10 April 2014 and 19 May 2014. The Forum of the Ile-de-France Entities for a better management of the sound environment. The forum is for all local authorities in the Paris regions. In the same time the questionnaire translated in French was distributed to participants. The meetings were held to support Local authorities to deal with the END and especially with the noise action plan.

Since the beginning of the action French documents about different Quiet Area approaches were translated in English to prepare the report “state of the art”.

The questionnaire for stakeholders was translated into French in June 2012. Questionnaires for stakeholders from IAU and CRETEIL laboratory were translated in English to prepare the Quadmap questionnaire.

A leaflet and two articles about Quadmap were realised in French.

To Promote the work done by the cities partner’s and hear the acoustic environment of the pilot case, a sound designer Frederic Fradet was engaged, for the achievement of quality audio recordings and the creation of a dedicated web interface to promote pilot cases of the project (See Annex 13). Thus, for each city and for each pilot case, it is planned for users to

visit with his ears and hear the result in terms of sound environment before and after the implementation of interventions. To complete the user information about each pilot cases an interview with a representative of the city for explaining the interventions is also present on each interface for each city. The sound and didactic maps with audio recordings to visit with his ears the pilot cases of the project and carried out the interventions is online on the Quadmap website.

The direct link to access is: <http://hosted.bruitparif.fr/quadmap>.

Translation into French of the different sections of the Quadmap website. Translation into French of the final user questionnaire. Important work of translation for the final Quadmap methodology guide version for French users.

Finally, Bruitparif give a good contribution to the improvement of the Quadmap methodology guide. In addition, it made an important internal work to propose a French version of the Quadmap methodology guide for French and Belgian users.

#### Problems encountered and solutions

None.

#### **4.2.2.6 Action E.19 – Action leader FIRENZE**

##### Brief description and objectives

Action E.19 was aimed at collaborating to dissemination activities and at organizing a workshop for dissemination of results in Italy.

##### Actual results (What and How)

##### ***Foreseen Action objectives***

Organization of a workshop for dissemination of results in Italy. Dissemination activity of FIRENZE will be mainly focused at EUROPEAN LEVEL with the participation in EURO CITIES conferences to present requalification and noise reduction interventions realized in the four selected pilot areas.

##### ***National Level***

- Information on the project's result provided at national level during a workshop, organized together with Associated Beneficiary VIENROSE (to be held in Florence), fully devoted to QUADMAP dissemination results: indicatively at the end of 2014, to present in Italy procedures and methods used to select/analyze/manage from different point of view Quiet Areas. Regarding pilot quiet areas in the City of Florence, results of intervention realization and ante/post-operam results of data acquisition to test the methodology. In particular, the role of FIRENZE is finalized to events organization (location, catering, publicity, leaflet and proceedings printings etc.), as well as that of organizing secretariat;
- participating in Acoustic Italian Association yearly congresses, being present with scientific papers. The aim is to give project's results the widest diffusion, in particular regarding ante and post operam data acquisition in pilot cases results and to present results of intervention in selected quiet areas.

##### ***Local Level***

- organization of meetings to be held in Florentine different districts where selected quiet areas are, and where relative interventions will be developed. The idea is to program periodic

open meetings where state of the art about project's various steps will be described, and citizens and stakeholders opinion will be heard.

Great relevance will be given to citizen participation and involving in these occasions, publishing these events on the website with adequate anticipation and producing vulgarization documents, ad hoc to communicate and transfer the main items coming out of the project development that could be interesting for both General Public and Stakeholders

- A link with QUADMAP website will be created on FIRENZE website ([www.comune.fi.it](http://www.comune.fi.it)), and news of the project regularly published and updated.

In such occasion notice boards describing the project and mainly activities interesting for citizens will be displayed at strategic places accessible to the public

Each publication or link will always acknowledge the European Union financial support.

### ***Achieved Action objectives***

#### *Dissemination at national level*

See Annex 5.

#### *Dissemination at local level*

See Annex 5.

### Problems encountered and solutions

In the first period (year 2012), due to a severe cutting cost policy carried out by the Municipality, some of the foreseen activities, mainly related to the participation to congresses and meetings abroad have been cancelled. In the following years this problem has been solved.

## **4.2.2.7 Action E.20 – Action leader BILBAO**

### Brief description and objectives

Action E.20 was aimed at collaborating to dissemination activities in Spain.

### Actual results (What and How)

| <b>Tasks foreseen in the Project proposal</b>   | <b>What has been done</b>  |
|---|--|
| <p>Organization together with TECNALIA of a workshop fully devoted to quadmap</p> <p>Eurocities meetings: devoting a place in the agenda to quadmap project</p> | <p>In relation with the workshop and the Eurocities meeting organization, Bilbao municipality collaborates with TECNALIA in coordination with the rest of the partnerships to select November 2013 to celebrate these two events. The main objective of these meetings is to present the results of the interventions and actions developed to create quiet areas in Bilbao and to share experiences with the rest of the partnerships involve in the project. Some meeting with the municipality were developed to start to define the agenda for the meeting.</p> <p>In relation with the workshop and the Eurocities meeting organization, Bilbao municipality collaborates with TECNALIA to define:</p> <ul style="list-style-type: none"> <li>- a program for the workshops defining the participants and the dates for the celebration (November 2013).</li> <li>- the venue for the workshop was defined and the invitations for speakers were send with a 90% of confirmation of participation.</li> </ul> <p>The main objective of these meetings is to present the results of the interventions and actions developed to create quiet areas in</p> |



| Tasks foreseen in the Project proposal | What has been done   |
|--|--|
|  | Bilbao and to share experiences with the rest of the partnerships involve in the project.  |
| translation in Portuguese of website   | The website translation has been carried out within the project conclusion.  |
| organization of citizens workshop      | In connection with the organization of citizen's workshop a first meeting was developed. The purpose of the meeting was to give information regarding the project and to obtain useful information for the selection of the pilot cases and to collect ideas for the future interventions.<br>In addition, the results of the meeting, developed in the April-June period, with some representatives of neighborhood association, were analyzed. The information obtained is useful to define the clues for the organization of the following workshops. |

#### Problems encountered and solutions

None.

#### **4.2.2.8 Action E.21-PM – Action leader UNIFI**

As already mentioned in section 4.1, during the action E.21-PM the project management activities have been carried out as expected.

#### **4.2.2.9 Action E.22-MON – Action leader UNIFI**

A specific action (E.22-MON) has been started for monitoring activities foreseen by Life+Common Provisions. During the kick-off meeting, the monitoring strategies have been agreed with all the partners. The strategy is formalized in the “Monitoring Handbook” (attached to this report). Action E.22-MON is meant to keep a constant check on the activities development and, each trimester, the project is monitored by the coordinator. Generally speaking, the monitoring is performed according to the documentation provided by the partners which is gathered by the monitoring unit and assessed by the scientific and steering committees.

Further details about monitoring activities are provided directly on the Monitoring Handbook.

#### **4.2.2.10 Action E.23-NET – Action leader UNIFI**

##### Brief description and objectives

Action E.23 was aimed at carrying out networking activities foreseen by Life+Common Provisions.

##### Foreseen objectives

The expected results of networking activities are, as indicated by the LIFE+ Common Provisions, to ensure an efficient transfer of know-how and experience between projects carried out on similar topics and/or by means of similar methodologies (especially dealing with the aspects described in the action description section). The aim is to maximize the effectiveness of the work, and to foster the replication of projects' experiences in similar contexts.

##### Objectives reached and comparison with the originally planned ones

- Researching about other projects concerning environmental noise, especially LIFE + ones, carried out in the last fifteen years and to work out these ones which focus on QUAs.

- Getting in contact with reference people of the most important projects and, updating of know-how by a continuous communication activity. 1 person from UNIFI staff has participated to the meeting of partners from EU funded projects and FONOMOC on 8th December during which a round table EU funded projects and FONOMOC members (with a 10-15 minutes presentation for each project) has been held and to the final event of HARMONICA Project the day after. This has been also an occasion for networking, thanks to the poster session organized during the event, to which UNIFI, VIENROSE and FIRENZE have participated with a poster about QUADMAP.

- The first Networking report has been completed by the end of June 2012, including also the results of the event “Urban Noise Management Symposium – Workshop about Noise Mapping, Action Plans, Quiet Areas” organized in Florence on 24th January 2012.

The second Networking report has been completed by the end of January 2013, including the results of information exchanges with the QSIDE responsible.

Participation to the QSIDE workshop “ Quiet facades and quiet urban areas – benefits for people and implementation in urban noise policy” held in Lyon on the 24th April 2013 where the presentation “QUADMAP project – current results” was exposed and exchanges with other experts about quiet areas and urban noise management have been possible.

The third Networking report has been completed by the end of June 2013, including the results of information exchanges with the QSIDE responsible.

On September 2013 UNIFI has been keeping in contact with Bruitparif (in its role of coordinating beneficiary of HARMONICA project) in order to exchange information concerning the possible application of CNI Indexes developed by HARMONICA to pilot cases selected in Florence (see Action C.8-C.11). These Indexes permit the evaluation of quietness in urban areas and have also been described during the Inter-Noise held in Innsbruck in mid-September 2013.

In October 2013 contacts have been established with colleagues from CNR and from the University of Perugia, in order to share information on psychoacoustic parameters and to compare results obtained on the same sets of data, but with different software.

The fourth Networking report has been completed by the end of December 2013, including the results of information exchanges with the Universities of Rome and Perugia.

During the months of March and April 2014 new contacts have been established with Bruitparif who contributed to the evaluation of several acoustical indexes (CNI indexes) and parameters from long term measurements, in order to help the completion of the analysis procedure.

The fifth Networking report updated to June 2014 has been completed in August 2014.

The last Networking report updated to March 2015 has been completed by the end of the Project and include the results of networking activities carried out in particular during the workshop held in Florence in December 2014 and during the final event held in Rotterdam in February 2015.

### 4.3 Evaluation of Project Implementation

#### **Methodology applied**

The methodology applied by the QUADMAP partners in order to achieve the Project objectives, can be overall evaluated as positive. In fact, the development of a harmonized methodology to select, analyse and manage QUAs, which is the main objective of the Project, has been perfectly achieved, delivering a technical report about the method and a guideline to facilitate its use and implementation.

The efficiency of the introduced procedures has been proved after their application in a significative number of pilot cases located in different European Countries, both during the ante and the post-operam phases of analysis and optimized accordingly.

The Project management procedure, with reference to the monitoring activities carried out every six months, has proved to be more efficient (documentations delivered fairly timely by the partners) if compared to the one originally defined by quarterly monitoring periods, which has been evaluated as too restrictive after the first year experience.

Concerning project's failures, the time period required for the completion of interventions in Florence and Rotterdam was higher than expected. For this reason, the request of a Project Amendment has been necessary.

The total costs of actions are in line with original previsions, although their distribution is slightly different from what was originally foreseen (see Section 6).

In Table 2, the main Projects objectives are evaluated.

**Table 2: Evaluation of Projects objectives**

| <b>Task</b>  | <b>Foreseen in the revised proposal</b>   | <b>Achieved</b>   | <b>Evaluation</b>  |
|--|---|---|--|
| Action D.13<br>Production of a methodology to select, analyse and manage QUAs and related toolkits | Methodology guidelines to be produced in English  | Methodology guidelines (see D14) also translated in Italian, Dutch, French and Spanish.   | Extremely positive since a complete and wide comprehensible document accompanied by intuitive examples has been produced. Moreover the guidelines have been translated into a lot of languages, more than expected, with no extra costs.   |
| Actions C.7-C.8-C.9-C.10-C.11-C.12<br>Analysis carried out in the pilot areas                      | Qualitative and quantitative analysis to be carried out in eight pilot areas during the ante-operam phase | Qualitative and quantitative analysis carried out in ten pilot areas during the ante-operam phase.<br><br>Moreover, an additional pilot areas was investigated in France in the frame of action C.10. | Extremely positive since the ante-operam analysis permitted both to understand which main interventions (qualitative and quantitative) were needed in the pilot areas and to contribute to the methodology optimization. Moreover the analysis have been performed in a number of pilot areas greater than expected with no extra costs. |
| Actions C.7-C.8-C.9<br>Interventions realization in the pilot areas                                | Qualitative and quantitative interventions to be implemented in eight pilot areas                         | Qualitative and quantitative interventions implemented in nine pilot areas  | Extremely positive since the overall number of implemented interventions and relative costs was higher than foreseen (with no additional contribution requested to EC) and because they allowed the introduction of effectively Quiet Urban Areas in different European cities.  |

With particular reference to the interventions realization and the introduction of the guidelines, it is important to notice that these main project aims would not have been achieved if the Project amendment had not been requested and approved. In fact, the available time would have been insufficient in the Project frame to complete these actions.

## **Dissemination effectiveness**

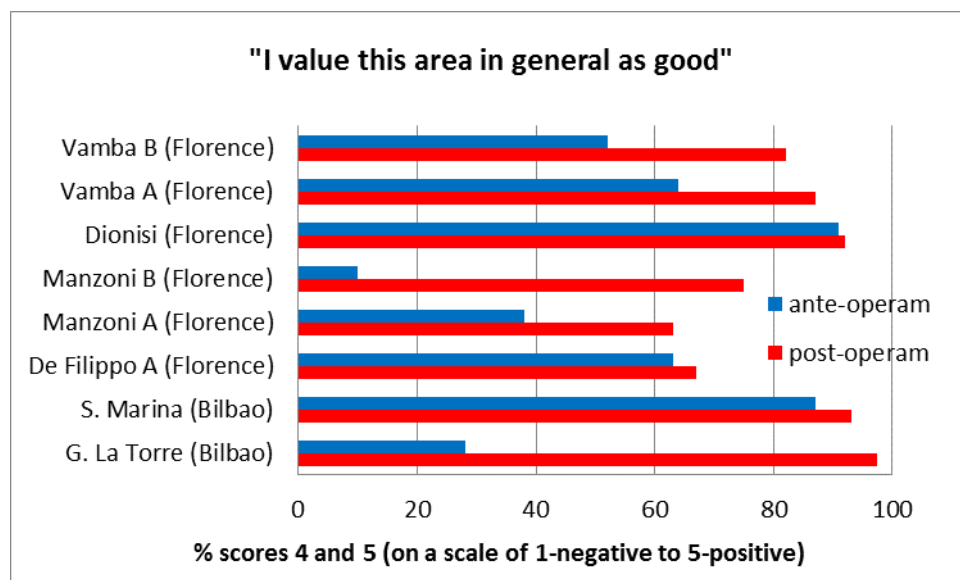
In general, all foreseen dissemination activities have been carried out with no occurred problems. In many cases, carried out actions have been more than expected, with no additional costs for the Project.

Main advantages obtained from the dissemination actions are the following:

- contacts established with city managers after the final project event;
- activation and continuous updating of the F.A.Q section of the project website;
- gradually greater visits to the project website;
- gradually greater number of publications downloading from web portals such as Research Gate;
- invitations to Round Tables organized in the frame of other European and specifically LIFE+ projects (e.g. QSIDE, HARMONICA; etc.).

#### 4.4 Analysis of long-term benefits

In general, in all cases the benefits consist in an improvement of the evaluation (carried out by experts after the intervention) and in the increasing of citizens satisfaction, as shown in the following figure related to pilot cases in Florence and Bilbao.



*Citizens perception immediately after the interventions realization in Florence (for each area the letter A or B refers to the identified HUAs) and Bilbao*

Referring to the acoustic benefits, the implemented interventions permit in some cases to hardly reduce noise levels, where noise barriers take place. In other cases the noise levels have been only slightly reduced or not reduced. For example, in the pilot cases located in Florence, according to short term measurements associated to questionnaires, average noise levels have proved to be lower during the post-operam surveys, with benefits **up to 8 dB** in terms of LAeq in the shadow zone behind the barrier.

Referring to the possibility of reducing the negative events (e.g. due to road traffic noise) in the pilot case of General la Torre in Bilbao, after the realization of interventions, the higher presence of people and children (and the sound of water) have increased the background sound (LAeq) and the **number of positive events**. At the same time, the urban barrier has masked the traffic noise (reducing the presence of negative events).





|      | Morning     |             | Evening     |             |
|------|-------------|-------------|-------------|-------------|
|      | 11:00-11:30 | 11:30-12:00 | 18:00-18:30 | 18:30-19:00 |
| LAeq | 64 dBA (-3) | 66 dBA (+4) | 64 dBA (0)  | 66 dBA (+4) |

*Noise levels (LAeq) and noise events evaluated in general la Torre square for the post-operam phase (in brackets the difference between the post and the ante-operam scenario)*



|                   |        |        |        |        |
|-------------------|--------|--------|--------|--------|
| Events (negative) | 2 (-4) | 2 (-4) | 2 (-7) | 0 (-2) |
| Events (positive) | 0      | 0      | 0      | 4 (+4) |

In General La Torre square, referring to the periods in which ante and post-operam questionnaires have been submitted, noise levels (LAeq) are even slightly increased (2-3 dBA) after the realization of interventions. This fact in general can be explained according to the typologies of interventions realized in General La Torre square, where they were not specifically aimed to reduce noise levels as to modify dominant sound sources and increase positive events.

Finally, regarding the analysis carried out by experts, depicted criticalities have been solved by the end of the project. As an example, from the comparison of results concerning non acoustic principal factors and respectively achieved during the ante and the post-operam phase, it can be seen that the criticality emerged for the Dionisi school (Florence), concerning **safety**, was solved during the post-operam phase.

| CRITERIA | DESCRIPTION                                      | PARAMETERS  | RATING  | DIONISI SCHOOLYARD  | INPUT TO DEFINE POSSIBLE SOLUTIONS  |
|----------|--|---|---|---|---|
| Safety   | Evaluation of safety by observation from experts | Dangerous zone (robberies, attacks or accidents from official statistics in the area) |  |  | Propose interventions to improve safety.<br><b>04: TO CLOSE THE GARDEN WITH A BARRIER</b> |
|          |  | Not guarded spaces or dark zones without lighting                                     |  |   |   |
|          |  | Guarded and lighted spaces  |  |   |   |

*Expert analysis-ante operam scenario for the pilot cases selected in Florence (Dionisi schoolyard)*

| CRITERIA | DESCRIPTION                                      | PARAMETERS  | RATING  | DIONISI SCHOOLYARD  | INPUT TO DEFINE POSSIBLE SOLUTIONS |
|----------|--|---|---|---|------------------------------------|
| Safety   | Evaluation of safety by observation from experts | Dangerous zone (robberies, attacks or accidents from official statistics in the area) |  |  | /                                  |

Moreover, the contribution to the implementation of END or to END revision, including possible criteria for QUAs definition and management, could find further developments after the end of QUADMAP.

In fact, according to the Project proposal QUA definition, based on both acoustic and non-acoustical data, could be successively refined, with special regards to selected kind of noise

receivers, buildings and urban areas like sensitive and vulnerable areas (schools, hospitals, etc.), urban parks and green areas, squares and recreational public spaces, etc.

Also some post QUADMAP activities specifically devoted to the definition of QUAs on the basis of both acoustic and non-acoustical criteria can be considered as a continuation and valorization of the project.

Accordingly to on-the-field experience of partners and, more generally, to common experiences in the field of standardization and optimization, it is deemed that a constant improvement and refinement of methodologies should be fostered. Even if the optimization of a general methodology was the main aim of the present project, we think that it is worth the trouble to foster an incremental check, revision and update of the present work in order to support its adoption even though unexpected issues will arise in the time.

1. *Relevance for environmentally significant issues or policy areas (e.g. industries/sectors with significant environmental impact, consistency with 6<sup>th</sup> or 7<sup>th</sup> (as applicable) EU Environment Action Programme and/or important environmental principles, relevance to the EU legislative framework (directives, policy development, etc.)*

The developed methodology and related guidelines could contribute to an improvement of the Environmental Noise Directive (END) with specific regards to the Quiet Urban Areas item. In any case, since a harmonized methodology or guideline to select, analyse and manage QUAs did not exist before, QUADMAP Project has contributed to introduce it to facilitate the implementation of the END. Referring to the definition of a “Quiet Urban Area” in the QUADMAP project a definition was proposed and it could be helpfully considered in the frame of the revision process of the END.

2. *Long-term benefits and sustainability*

A broad diffusion of the guidelines developed by the QUADMAP Project and of translated versions is expected. As a consequence, a reduction of noise, an increase of positive events and a more positive perception into QUAs by users is expected in all cities which will apply the guidelines.

3. *Long-term / qualitative economic benefits (e.g. long-term cost savings and/or business opportunities with new technology etc., regional development, cost reductions or revenues in other sectors)*

Thanks to results achieved by the QUADMAP Project, the procedure of selection, analysis and management of QUAs will take a few time (with a consequent cost savings for time needed to perform these activities) since procedures to be applied are clearly defined and explained in the guidelines. In addition, typologies of preferably implementable interventions are already suggested and examples of each Tool's application are made available.

4. *Long-term / qualitative social benefits (e.g. positive effects on employment, health, ethnic integration, equality and other socio-economic impact etc.)*

Thanks to results already achieved by the QUADMAP Project, but also to results expected from the diffusion of the Project guidelines, cities and citizens will benefit from the presence of available QUAs. In addition, according to the methodology introduced, the social benefit will be significative, since interventions to be carried out in the QUAs are suggested not only from noise measurements, but also and especially from interview submitted to citizens and qualitative evaluations made by technical experts.

5. *Continuation of the project actions by the beneficiary or by other stakeholders.*

Project's actions to be continued after the conclusion of the project itself are mainly Action D.13 and dissemination actions (Package E).

In fact, it is expected that by using the EUROCITIES network (supporter of the QUADMAP project), guidelines will be distributed to all the 130 cities included in the network, and by those applied in new scenarios and disseminated to a high number of interested people.

According to the project proposal, Actions of Package E will be carried out also after the conclusion of the project at least for three additional years via EUROCITIES and via the Project website.

6. *Replicability, demonstration, transferability, cooperation: Potential for technical and commercial application (transferability reproducibility, economic feasibility, limiting factors) including cost-effectiveness compared to other solutions, benefits for stakeholders, drivers and obstacles for transfer, if relevant: market conditions, pressure from the public, potential degree of geographical dispersion, specific target group information, high project visibility (eye-catchers), possibility in same and other sectors on local and EU level, etc.*

In current applications, the method is certainly applicable at European level, since it was established taking into account several experiences at European level and it has been tested on pilot cases in three different Member States.

Moreover, the partner Bruitparif performed internal harmonization among the different proposed solution with special regard to the possibility of generalizing them at EU and international level. In particular, France was chosen as additional test country for the applicability and adaptability of the proposed methodology. As a consequence, the analysis phase of the optimized methodology, together with finalized tools, was further tested on the area of “bassin de la Villette” in Paris. From results obtained in this application, the possibility of transferring the methodology to other countries has been confirmed, bearing in mind that all the pilot cases selected by the project should be considered as good examples and not as templates to reuse systematically.

To facilitate the transferability, appropriate guidelines were prepared, together with tools and application examples derived from the pilot cases, and they have been translated in the languages of project partners.

The transferability of the method is also encouraged and strengthened by the following actions of dissemination:

- Development of a website [www.quadmap.eu](http://www.quadmap.eu).
- Dissemination at European level by:
- Connection with OTHER EUROPEAN PROJECTS;
- Knowledge sharing with EUROCITIES, the network of major European cities, operating in 33 European countries and representing the interests of its members in dialogue with the European institutions across a wide range of policy areas affecting cities. EUROCITIES will allow the diffusion of results and will lead to support other countries willing to apply the proposed methodology. The periodic meetings carried out by the network itself define some of the QUADMAP partners being also EUROCITIES members, the way for the reaching of the 130 EUROCITIES members. The project's guidelines have been sent to EUROCITIES office and they will distribute this to all European cities being member of EUROCITIES.

In this way, a continuous action of dissemination and demonstration of gained results can be an incitement to adopt the QUADMAP methodology in the cities, in order to improve the metropolitan quality of life year after year.

7. *Best Practice lessons: briefly describe the best practice measures used and if any changes in the followed strategy could lead to possible adjustment of the best practices*

As the main best practice lesson, the user's opinion and perception in relation to QUAs are important data to be considered in all phases of the methodology. In particular, an appropriate format for the end-users questionnaire has been developed inside QUADMAP, to be applied during the analysis phase in order to ask citizens about their acoustical and more general perception about QUAs but also to obtain suggestions for measures to be implemented in the areas. Moreover, interviews can be usefully repeated in the post operam scenario as best practice tool to be compared with the ante-operam ones. The aim is to evaluate the efficacy of the carried out interventions also from the end-users perception point of view.

In addition, as another best practice action coming from the project guideline, the suggestion to implement naturalistic interventions in the pilot areas, with respect to the autochthonous plants and currently present plant and animal species, arises.

8. *Innovation and demonstration value: Describe the level of innovation, demonstration value added by EU funding at national and international level (including technology, processes, methods & tools, organisational & co-operational aspects);*

Since a harmonized and complete methodology for the selection, analysis and management of QUAs did not exist at European level, the main innovative results of QUADMAP Project is the development of such a methodology and related tools as well as its explication and diffusion by means of appropriate guidelines. Referring the demonstration value, it can be found in the great number and different typology (school yards, squares, parks, green corridors) of pilot cases where the method has been implemented.

9. *Long term indicators of the project success: describe the quantifiable indicators to be used in future assessments of the project success, e.g. the conservation status of the habitats / species.*

The number of cities that cited in the Action Plan taking into account the QUADMAP guidelines for the selection, analysis and management of QUAs can be considered as the main long term indicator of the Project success.



## 5. Annexes

Please make a reference to the annexes in the report text. In case the annexes are presented in local languages, a summary (titles, headings, map keys, etc) in English should be included, either in the report or in the annexes.

Annexes should be provided in paper form and in electronic form.

- The electronic version must be complete and include all annexes.
- The paper version may make a reference to a previous submission of the annexes e.g. that certain brochures were submitted with the report submitted on (date).

### 5.1 Administrative annexes

- At the stage of the final report most administrative annexes, including all **Partnership agreements** (if relevant), should have already been submitted to the Commission. For such previously submitted documents, a list indicating with which report they were already forwarded to the Commission is sufficient.

Annexes forwarded with the Inception Report (31/05/2012)

- Partnership agreement-Annex 6.1
- Monitoring handbook (rev.3)- Annex 6.2
- Online Database documentation and stakeholder questionnaire- Annex 6.3
- Indicators table-Annex 6.4

Annexes forwarded with the Mid Term Report (30/11/2013)

- Dissemination Plan-Annex 1
- Notice boards and photos-Annex 2
- Papers-Annex 3
- Dissemination materials-Annex 4
- Report on Networking activities-Annex 5
- Minutes of internal meetings-Annex 6
- Indicators table-Annex 7
- Photos-Annex 8

### 5.2 Technical annexes

- List of keywords and abbreviations used

KEYWORDS:

- Environmental noise
- Environmental Noise Directive
- Quiet Areas
- Soundscape

ABBREVIATIONS:

- QUA: Quiet Urban Area.
- rQUA: relative Quiet Urban Area.
- END: Environmental Noise Directive (European Directive 2002/49/EC, 25 June 2002).
- GIS: Geographical Information System.
- HUA: Homogeneous Urban Area.

- Technical reports, e.g. hydrological studies, see Annex 6.
- Maps, drawings, technical designs, technical memos etc, as appropriate.

## 5.3 Dissemination annexes

### 5.3.1 Layman's report

See Deliverable D15.

### 5.3.2 After-LIFE Communication plan – for LIFE+ Biodiversity and LIFE Environment Policy and Governance projects

See Deliverable D16.

### 5.3.3 Other dissemination annexes

In electronic format (on one or more CD-ROMs, memory sticks or DVDs appropriately labelled and indexed):

- **All the photographs** produced during the project (in high quality, high resolution JPEG/TIFF format or better (e.g. RAW) see Annexes 5, 7, 8, 9, 10, 11.
- **All dissemination related products** (brochures, scientific articles, guidelines, books, posters, newsletters, ...) in PDF format; see folder “Deliverables”, Annex 5 and Annex .
- **Videos** (if relevant) See Annex 12.
- **Standard presentation** illustrating the main actions and results of the project (set of slides / colour photographs, electronic images with captions) see Annex 5.

See also Annex 13 for the link to the “Virtual sound field trips of Quadmap pilot cases” carried out during Action E.18.

In paper format: Any document, map or publication which is an identifiable product of the project or which is useful to assess the success of the project.

- Dissemination / publication list
- Articles,
- Books
- Brochures

## 5.4 Final table of indicators

See Annex 15.