MEMORANDUM OF UNDERSTANDING

For the implementation of a European Concerted Research Action designated as

COST Action TD0804

SOUNDSCAPE OF EUROPEAN CITIES AND LANDSCAPES

The Parties to this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 270/07 "Rules and Procedures for Implementing COST Actions", or in any new document amending or replacing it, the contents of which the Parties are fully aware of.

2. The main objective of the Action is to provide the underpinning science for soundscape research and make the field go significantly beyond the current state-of-the-art, through coordinated international and interdisciplinary efforts.

3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 20 million in 2008 prices.

4. The Memorandum of Understanding will take effect on being accepted by at least five Parties.

5. The Memorandum of Understanding will remain in force for a period of 4 years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of Chapter V of the document referred to in Point 1 above.

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A. ABSTRACT AND KEYWORDS

Reducing sound level, the focus of EU environmental noise policy, does not necessarily lead to improved quality of life in urban/rural areas, and a new multidisciplinary approach is essential. Soundscape research represents this paradigm shift as it involves not only physical measurements but also the cooperation of human/social sciences (e.g. psychology, sociology, architecture, anthropology, medicine), to account for the diversity of soundscapes across countries and cultures; and it considers environmental sounds as a 'resource' rather than a 'waste'. Although there is significant research activity at the national level and this new paradigm is touched upon in work packages scattered across European Framework projects, there is no systematic international coordination and multidisciplinary cooperation. Aiming at providing the underpinning science and practical guidance in soundscape, this Action will create a vibrant/productive international network of initially 25 participants from 18 COST countries and 7 partners outside Europe; and the Action will deliver an integrated database of laboratory/field studies, harmonised/standardised soundscape assessment and indicators, academic and practical publications, and tools to support designers and decision makers in planning and reshaping urban/rural spaces. The Action promotes health and sustainability, attracts investment, conveys cultural uniqueness/diversity and enhances quality of life (e.g. in Agenda 21).

Keywords: Soundscape, quality of life, culture, environment, noise.

B. BACKGROUND

B.1 General background

Environmental noise, including sounds from road/rail/air traffic, industries, construction, public work, and the neighbourhood, is often a main cause of environmental distress in terms of the number of complaints received. Over 30% of the EU population is exposed to noise levels above the WHO recommendation. The potential effects of community noise include startle and defence reactions, aural discomfort, impairment of hearing restoration, cardiovascular effects, sleep disturbance, speech interference, learning and working performance reduction and annoyance responses. These effects, in turn, can lead to social handicap, absenteeism in the workplace and school, increased drug and health-care use, accidents and loss of property value.

The publication of the EU Directive Relating to the Assessment and Management of Environmental Noise (END) in 2002 has led to a number of major actions, including the large-scale noise mapping for major sources and cities across Europe. The END has also called for action on "quiet areas" – a particular type of soundscape that is worth preserving due to its unique quality: quietness. Many so-called quiet area mapping is being carried out, but it is not clear where to go with it, or how to use it, or how to incorporate it in design.

On the other hand, while reducing noise level has been the focus in the END, as well as in other regulations/policies worldwide, it is widely accepted that reducing sound level is not always feasible and cost-effective, and more importantly, will not necessarily lead to improved quality of life and people's satisfaction. For example, recent studies in urban open spaces have shown that when the sound level is below a certain value (as high as 65-70dB), people's acoustic comfort is not related to the sound level, whereas the non-acoustic factors such as the type of sound sources and characteristics

of users, play an important role. The importance of considering the overall sound environment rather than just noise sources, especially road traffic, may also become more significant with the development of quieter vehicles, which is one of the major actions along with the END.

While billions of euros are being spent on environmental noise reduction, there is an urgent need to bring ideas together, sort them out, and provide both research and practice directions.

Soundscape research, different from noise control engineering, is about relationships between the ear, human beings, sound environments and society. Research in soundscape covers physical science, engineering, social science, humanity, medicine, and art. It has been mainly developed within the academic disciplines of anthropology, architecture, ecology, design, human geography, linguistics, medicine, noise control engineering, psychology, sociology, and more recently computer simulation and artificial intelligence. As a global concept, it may also be fruitful to integrate insights from knowledge or values produced by every culture, therefore involving literature and musicology, and more generally, art, aesthetics, laws and religious studies as well.

Soundscape research represents a timely paradigm shift in that it considers environmental sounds as a 'resource' rather than a 'waste'. It is powerful than the classic level-based approach which is only suitable for providing primary needs such as sleep and hearing protection. It becomes even more prominent when a society reaches the highest needs: respect for others and creativity and spontaneity. Soundscape indeed focuses more on the local individual needs (e.g. in sustainability, agenda 21) and has esteem for the noise sensitive and other vulnerable groups. It also has ear for cultural aspects and the beauty of natural soundscapes.

There is significant activity in soundscape research at the national level in Europe and beyond. At the same time the soundscape paradigm has found, or is finding, its way to many European research framework projects (see Section B4). Indeed, each of these projects contains at least one work package that deals with aspects that could be classified as soundscape research. However, little has been done in the way of coordinated effort at the international and interdisciplinary level. The above mentioned research has resulted in and may continue to result in small steps forward in this scientific field, but has also hindered important break-through. COST is the best mechanism to fund the proposed network because:
(1) It will streamline and harmonise current research methodologies so that studies across the world can be compared and contrasted.
(2) It will bring together all researchers and research projects from across Europe by means of the activities in this Action and thus avoid duplication of work and improve the efficiency of scarce funding opportunities. Moreover, large inter- and trans-disciplinary efforts in large scale studies are essential for soundscape research but it is very unlikely that they will be financed by single national or international research funding agencies.
(3) It encourages multi-sectoral collaboration, allowing practitioners and policy makers to benefit too, which is a crucial facet for soundscapes.

The proposed Action will provide the underpinning science and practical guidance in soundscape, and it will promote health and sustainability, attract investment, convey cultural uniqueness/diversity and enhance quality of life.

B.2 Current state of knowledge

Although the term soundscape was introduced in the 1960s, significant attention to soundscape has mainly been paid in the last decade in the field of community noise and environmental acoustics by researchers and recently by policy makers; the number of people in the field/sector has been steadily growing. In the recent major international conferences including the Acoustical Society of America (ASA) meetings since 1998, the International Congress on Noise Control Engineering (internoise), the International Congress on Acoustics (ICA), the International Congress on Noise as a Public Health Problem, the European Conference on Noise Control (euronoise), a number of special sessions on soundscape research have been organised by participants of this Action, from a range of viewpoints including acoustical, social, psychological, physiological, linguistic, historical and architectural aspects. In 2006 a special issue of Acta Acustica united with Acustica (the Journal of the European Acoustics Association) was produced on soundscape, edited by the participants of this Action. While the benefits of interdisciplinary research have been initially demonstrated from the above, systematic international coordination and multidisciplinary cooperation is urgently needed in the field.

The importance of soundscape research has been recognised by governmental organisations and national funding bodies in Europe, and a number of national research projects relating to this field have been, and are being, carried out in Europe, such as the Noisefutures network and associated positive soundscape projects funded by the UK EPSRC (Engineering and Physical Science Research Council), the 'Soundscape support to health' project funded by the Swedish Foundation for Strategic Environmental Research, the "Eyer-Hear Project - Qualitative sound maps for visualization of the urban soundscapes", funded by the Portuguese Science and Technology Foundation, and a series of soundscape projects funded by the French Ministry of Town Planning, Housing and Construction, as well as the PREDIT program (National Research Program on Innovation in Transport). In other parts of the world including Australia, Canada, USA, Japan, China, Hong Kong and Korea, considerable attention has also been paid to soundscape research.

There have also been increasing interests in practice. For example, the Greater London Authority (GLA) is currently actively promoting several practical exemplar soundscape projects, and the City of Berlin is promoting the soundscape research with regard to its application concerning action plans and public places. Soundscape approach has also been applied to preserve and restore archaeological places of great importance such as Pompeii in which the tourist sensation shall be globally connected to the atmosphere of the historical site.

However, the current research works in soundscape are still at the stage of describing and identifying the problems, and they tend to be fragmented and focused on only a few special cases, e.g. based on common sense categorisation of soundscapes and on local interests such as evaluation of soundscapes especially for residential areas. A number of issues need to be addressed, for example:

(1) While in the paradigm shift from purely noise control to soundscape design, a vital step will be the explicitation, comparison, and evaluation of methods and indicators from different scientific domains in order to model soundscapes in their globality, there is currently a lack of standardisation and explicitation in the categorisation and measurement procedures, and there are few tools.

(2) The importance of quiet areas within reach is recognised by the EU but no clear definition is given and there is no method by which "good" or "restorative" sound environments can be measured.

(3) There is no clear understanding of the different evaluations of noise in different settings and cultures.

(4) Relationships between subjectively assessed “acoustic quality of the environment” and perceived health-related quality of life and functional health are still yet to be established.

B.3 Reasons for the Action

Participants of this Action have contributed significantly to a number of recent special sessions on soundscape at international conferences (see Section B2), and it has been concluded that there is an urgent need to coordinate efforts, in terms of scientific/technological advance as well as European economic/societal needs.

Soundscape research is an extremely inter- and trans-disciplinary field. Therefore the usual channels for exchange of scientific information are rather unlikely to be effective. Architects, urban developers, acoustics engineers, social scientists, psychologists, environmental health specialists, physiologists, brain scientists, etc. are rather unlikely to meet at existing conferences and scientific meetings. It is even unlikely that scientists and experts with such different backgrounds will regularly read each other’s scientific and technical publications or project reports. There are even issues surrounding the different disciplinary jargons. This Action will bridge these gaps. It will give the opportunity to researchers from different scientific communities, to work in synergy towards a better understanding of the sound environment perception in cities and landscapes, which will be helpful to identify relevant acoustic perceptual parameters, and to harmonise/standardise methods, indicators and outcomes in terms of quality of life and health, respecting the diversity of different disciplines, and different social contexts, settings and cultures.

This Action is also urgently needed because a lot of practical activity is occurring due to the END (see Section B1), but it is directionless at the moment, and the concept of soundscape is yet to be integrated – via the “quiet area” portal most probably. The knowledge to be provided by the Action is essential to fulfil regulatory requirements dealing with cross-cutting political aims such as sustainable development (e.g. agenda 21), environmental zoning, multi-sectoral environmental health impact assessment, consideration of “sensitive areas” design of “supportive environments“, and citizen involvement in the context of the END, all contributing to European economic/societal needs (also see Section C4).

With the great demand of researching into the new paradigm, soundscape, it is important to note that there is still a gap in soundscape research funding at the EU level; anticipated FP7 calls still focus on a more conventional approach to managing noise rather than understanding and designing ‘soundscapes’ that make a positive contribution to urban/rural development.

B.4 Complementarity with other research programmes

There have been a number of major European research projects focusing on various aspects of noise reduction, and the participants of this Action have been involved. Within the IMAGINE (Improved Methods for the Assessment of the Generic Impact of Noise in the Environment) project, following the Harmonoise project, new calculation methods for railway, road, industrial and aircraft noise have been developed. The SILENCE (Quieter Surface Transport in Urban Areas) project is to develop an integrated system of methodologies and technologies for an efficient control of urban traffic noise. While some sub-tasks on soundscape, perception, acceptance and expectation are included, the subjective evaluation is limited mainly to annoyance perception. Within the QCity (Quiet City Transport), an integrated technology infrastructure is being developed for the efficient control of road

and rail ambient noise by considering the attenuation of noise generation at source at both vehicle/infrastructure levels, where the subjective judgments of exposed people is addressed but not as the focus of investigation. In the CALM (Coordination of European Research for Advanced Transport Noise Mitigation) network, the need for perception related research for identifying indicators and parameters for quiet areas has been indicated, but no coordination activity is performed.

Related to impacts of environmental noise it is worth mentioning the RANCH (Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health: Exposure-Effect Relationships and Combined Effects) and HYENA (Hypertension and Exposure to Noise near Airports) EU framework projects. The RANCH has considered the potential benefits of a restorative soundscape at home on children's cognition, but the study mainly concerns the acoustic environment at home which is only a small part of the whole soundscape picture. In HYENA, the potential effect of restorative soundscapes was not considered.

This Action has links with the European 'Measuring the Impossible' Network (MINET), which aims at supporting the development of new methods and investigative techniques for the measurement of complex phenomena that are dependent on human perception and/or interpretation. With sound as one dimension, MINET well complements this Action.

Soundscape is related to Cognitive Systems - some participants of this Action are involved in Coordinated Action EUCognition and have been leading in the EUCognition2 the follow-up Coordinated Action. Auditory cognition will be a topic in EUCognition2 and will as such be complimentary to this proposed Action.

Recently some participants of this Action were involved in a FP7 proposal HOSANNA (Holistic and Sustainable Abatement of Noise by Optimized Combinations of Natural and Artificial Means), as well as ENNAH (European Network on Noise and Health). Although they did not explicitly include the soundscape paradigm, links could be established.

Overall, this Action complements current European research programmes in that it cross cuts these programs and coordinates the scattered work packages relating to soundscapes.

C. OBJECTIVES AND BENEFITS

C.1 Main/primary objectives

The main aim of the Action is to provide the underpinning science for soundscape research and make the field go significantly beyond the current state-of-the-art, through coordinated international and interdisciplinary efforts. The Action will promote soundscape into current legislations, policies and practice, aiming at improving/preserving our sonic environment.

C.2 Secondary objectives

Detailed objectives and their scientific impacts are:

(1) Understanding and exchanging

- Foster interdisciplinary cross-breeding of innovative and emerging scientific concepts and methods related to the main facets of soundscape research, connecting physiological (sensory), psychological, psycho-physical, cognitive, emotional, social, physical and architectural approaches and integrating the knowledge acquired from these different fields into explicit modelling (physics and computational intelligence). This will be vital for better understanding the overall and diverse effects of soundscapes on citizens, in positive or negative ways.
- Exchange technical know-how on an international/interdisciplinary basis including advances in measurement techniques, signal processing, source identification, auditory scene analyses, brain imaging/neural imaging/neuro-informatics, and cognitive modelling, considering the results based nationally funded research programmes.
- Examining cultural differences.

(2) Collecting and documenting
- Gather and maintain a repository of experimental sound and soundscape data to be reanalysed and studied from inter- and trans- disciplinary perspectives. Such a database will be an invaluable resource for scientists across Europe for years to come, allowing effective testing of new models and insights.

(3) Harmonising
- Review and harmonise the current vocabulary and methodology, and consequently, develop a new set of exposure indicators to characterise sound quality of environments that improves significantly on the conventional decibel level approach that has been the basis of current European and international regulations. The indicators would be suitable to assess health related quality of life and functional health which can then be used to evaluate claims related to health promotion benefits.
- Develop a standard protocol, such as text and/or audio-visual documentation, which can be used to better assess cross-cultural and cross-contextual differences that may be responsible for discrepancies of study results.
- Lay the foundations for future European/international standards.

(4) Creating and designing
- Provide practical guidance and tools for the design and implementation of soundscapes for use by urban planners and policy makers.
- Provide guidelines for preserving architectural heritage sites**.** Soundscape studies are not only for the improvement of the current sound environment but also for the conservation of our sound environments which can be classified as acoustic heritages.

(5) Outreaching and training
- Create awareness and promote communication concerning urban soundscapes and quiet areas amongst the general public, stakeholders and policy makers.
- Provide training for early-stage researchers, and strengthen the links between them and established experts in the field.

C.3 How will the objectives be achieved?

The objectives will be achieved through a series of:
(1) Themed workshops and think-tanks, with some innovative elements such as design competitions.
(2) Conference special sessions.
(3) Training schools for early-stage researchers with think-tanks.
(4) Exchange visits for Short-Term Scientific Mission (STSM).

(5) Awareness days for dissemination.

Regular meetings are planned for the Management Committee (MC), Steering Group (SG), as well as for the Working Groups (WG).

The results will be disseminated to a wide range of audience including researchers, policy makers, practitioners, and general public, through various means, including (see Section H, for a full list):
(1) Open soundscape database.
(2) Working papers/report generated from workshops/conferences, training schools.
(3) Booklet with design guidelines.
(4) Booklet promoting awareness.
(5) Media coverage.
(6) Scientific publications, including conference and journal papers, and books.
(7) Web site.

COST funding will be used to support:
(1) The above scientific meetings and events, including attendees within EU and invited experts from outside EU and the organisation and rewards for related competitions.
(2) Exchange visits for Short-Term Scientific Mission (STSM).
(3) Management Committee and Working Groups meetings (combined with scientific meetings and events wherever possible).
(4) Large-scale dissemination of information and recommendations.
(5) Publications.
(6) Establishment and maintenance of web site.
(7) Network/project management.

C.4 Benefits of the Action

The Action aims to contribute to the development of the scientific/ technological field, as well as to meet European economic and societal needs.

The scientific/technological impact of this Action will be significant:
(1) It will lead to a major step change in the scientific field of sound/auditory environment, which is only possible through coordinated international and interdisciplinary efforts. The project will therefore significantly enhance the research environment and capabilities for frontier research in Europe, making the EU at a world leading position in the emerging field of soundscape. The provision of training for early-stage scientists will ensure the maintenance of the leadership in the longer term.
(2) The Action will also bring a break-through in practice in the way of dealing with our sound environment, noting that our participants bring with them a cohort of end users including planners/designers and policy makers at EU, national and regional levels. Moreover, soundscape could be a variable to be added to the determination of some overall indices such as Environmental Burden of Disease (environmental health), Environmental Performance Index (environmental performance of a country's policies), and Environmental Sustainability Index.

The proposed Action will support the implementation of 'soundscapes', especially through WG4 and WG5 (see Section D), to create more enjoyable and liveable environment in Europe and beyond, with respect to the planning of new living and recreational areas as well as to the reshaping of unsustainable older developments. Good soundscapes strengthen and promote the image of the city/landscape,

stimulate tourism, create healthy stress releasing settings for its inhabitants and improve social cohesion. The health, cultural and economic benefits include:

(1) **Health**: Research indicates that quiet areas and restorative soundscapes can benefit mental health. Due to the increasing numbers of elderly people in the EU there is a need to provide supportive environments which prevent the degradation of functional health - it has been shown that the elderly run a greater risk of functional deterioration in neighbourhoods with negatively assessed acoustic environments. Also the engagement in health promoting activities such as walking and running is less likely in unpleasant neighbourhoods. The design/re-design of well perceived soundscapes is also a prerequisite of an adequate learning environment for children to foster language and cognitive development, motivation and social interaction.

(2) **Culture**: Soundscape is a significant factor in the 'sensing of places'. Our European cities and landscapes are now becoming more and more similar in terms of their sound environment and the diversity of sounds that distinguish and characterise places are to be lost, and the issue of maintenance and restoration of diversity of cultures, and of their soundscapes is vital, also as an important dimension of tourism. Moreover**,** in architecture/landscape heritage conservation, there is a lack of acoustic heritage knowledge. Soundscape studies will help the understanding of acoustic conservation and restoration, adding a new component/dimension to the "World Heritage" concept.

(3) **Economy**: Attractive soundscapes can enhance not only cultural identities but also on economical grounds enhance property prices, create an attractive setting for economic investment, offset health costs through provision of restorative living spaces, and reduce costs caused by anti-social behaviours. Indeed, while billions of euros are being spent on environmental noise reduction in Europe, soundscape research will help to prevent costly unnecessary infrastructural noise mitigating activities, and to provide more cost-effective solutions that will reduce for EU citizens negative noise effects. Moreover, the consideration of soundscapes for tourism could bring enormous economic benefits - both urban and countryside.

C.5 Target groups/end users

The Action has the potential to benefit every EU citizen through the development of new soundscape/noise indicators to help future sound mappings, which are more acceptable and understandable for the public. However, the key beneficiary groups that will directly benefit from the Action activities and findings include policy makers, planners, architects, environmental officers as well as tourism/heritage managers. For example, the project will raise awareness among decision makers that sound environment can influence well being; enhance capabilities of urban planners and stakeholders to approach the modifications of the environment using the soundscape perception, to respond to public demand and to reduce social costs for noise control; and inform tourist boards to adjust their policies considering the preservation of the soundscape for cities and historical places. Moreover, the results of this Action will certainly be used by researchers in a wide range of disciplines, including, for example, (culture) historians, as our world is rapidly becoming more and more uniform, leading to an impoverishment of characteristic soundscapes that may be of considerable cultural and historic value.

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

The plan for the network was mainly initiated by discussions among some participants of this Action at two meetings, one in Madrid during the International Congress on Acoustics in 2007, and the other in Paris during Acoustics'08. Based on the objectives (see Section C3), this Action will focus on five Themes, with corresponding Working Group (WG):
(1) Understanding problems through international/interdisciplinary cross-breeding and modelling and exchanging technical know how;
(2) Collecting and documenting data and case studies, in common databases;
(3) Harmonising: vocabulary, methodology, indicators;
(4) Creating and designing: developing guidelines considering sonic environment and heritages, and laying foundation for European/international standards;
(5) Outreaching and training: awareness, dissemination and training of early-stage researchers.

While the works in WG5 is what would normally be done by the Management Committee (MC), in this Action those will be dealt with by a focus group (WG5), ensuring effective dissemination and training. Nevertheless, close coordination will be made with the MC and the WG5 and MC meetings will be normally held together, to minimise costs (see Section E).

WG1: Understanding and Exchanging

The main focus of this WG lies in understanding how the soundscape within its proper context affects its users. This would require a wide range of multi- and interdisciplinary research: (1) Detailed knowledge on sensory perception is needed to identify features that are distinguishable by the human sensory system. Not only classical psychophysics can be useful in this respect but also recent results obtained from brain imaging. (2) The way the sensory perception is organised in objects and streams and how this depends on personal characteristics, and how attention affects the external environment is shaped internally, are important research topics. (3) To discover how meaning is attached to the objects and streams formed in the human mind, within a cultural and social context, is a tremendous challenge. It relates strongly to the spearhead research on the mechanisms of thought and the working of the human mind. (4) Somewhat in parallel to the above, the effect that a stressed or harmonised human-environment relationship can have on mental health needs further investigation. Modelling and simulation are strong tools for helping to understand how complex systems such as the human-soundscape interaction work.

Linguistic analyses could be made of the semantics of the vocabularies and of discourses encountered in the diversity of studies concerned with soundscapes using verbal responses. The case of linguistic analyses of verbal content is further mandatory because of the diversity of languages in Europe. This could also reflect the cultural variations in conceptualisations and subjective responses to noise and their relations to acoustic parameters. A workshop/think-tank is planned to explore these issues. (WG1.1)

Sound source recognition is a very detailed yet extremely important facet of understanding how soundscapes are perceived and how they affect the user. There are different angles to this problem: in a physical sense there may be an advantage in recognising the source of the sounds as accurate as possible, but it is equally important to identify what a human listener will detect and think to recognise

when exposed to the sound mixture. It is the latter that is essential as a starting point for understanding how people attach meaning to the soundscape. A special conference session is planned to present/exchange the state-of-the-art knowledge/techniques. (WG1.2)

To optimally use the results obtained by cognitive science, brain imaging/neural imaging/neuro-informatics, and research on auditory perception, the knowledge embedded in these research communities needs to be made reachable to the community of soundscape researchers. This Action will contribute by inviting selected experts from other but related fields to bring their views to a workshop. (WG1.3)

The Action will lay the foundation of a virtual community of scientists interested in computer modelling and simulation related to soundscapes and its perception by opening an internet portal linked to an existing open source code software repository (e.g. SourceForge). Simulation tools could include computational auditory scene analyses tools, numerical ear models, saliency detection modules, cognitive mapping tools, etc. The portal could also contain links to more generic tools of interest such as clustering and blind data analysis tools. A workshop is planned to explore the feasibility. (WG1.4)

WG1.3 and WG1.4 will be organised together. They could be two separate events, or, they could be combined in a two-day workshop, each day for one topic respectively.

Various modelling techniques for physical soundscapes and sound environments will be reviewed and compared. The effects of metrological/atmospheric conditions will be an important consideration, based on much work carried out in other EU programmes (see Section B4). Auralised soundscapes will be compared to real recording checking it for ecological validity. A special conference session on modelling is planned, where the use of facilities for 3D auralisation will be organised. (WG1.5)

Physical measure of soundscapes is another important dimension for understanding the human-environment relationship, and for validating the simulation/modelling. It is important to deal with applicable measurement procedures with respect to a balance between scientific accuracy and practical applicability, also considering comparability and reproducibility. A workshop is planned. (WG1.6)

WG1.5 and WG1.6 will be organised together, as two separate events, or, the workshop could immediately follow the special session.

WG2: Collecting and Documenting

The amount of soundscape data and the number of case studies using the soundscape concept for improving the living environment is steadily growing, including large datasets from the participants of this Action, within and outside Europe. In the same time, new techniques for assessing soundscape quality and new theories are being designed and invented. It remains however rather difficult to test new theories on available data. Harmonisation of measurements and description in the broadest meaning of the words would help considerably and WG3 will be focussing on this goal mainly. But it is also important to make the body of existing data available to all researchers in the field for testing their theories and ideas. WG2 will facilitate this with a set of workshops and special conference sessions. It is expected the database will stimulate researchers to start meta-analyses on the collected materials, which will strongly increase the statistical strength of the resulting conclusions.

A brain-storm/think-tank workshop is planned to explore such a pioneering soundscape documentation practice, regarding what data should be included, for example. It will also aim to design a set of meta-data to be used for indexing the existing data. The data could take very different forms: audio-visual recordings, interviews, tables obtained from social surveys, acoustic measurements with different equipment and procedures, etc. (WG2.1)

A follow-up workshop is planned to explore the techniques for the database establishment. It will actively look for and collect interesting datasets and case studies and bring them together in an online open repository. This could mean that servers have to be established but some of the data may remain at its original location (due to its size) and be referred to by a unique identifier. It has to be investigated whether the digital object identifiers system (www.doi.org) is applicable to create time surviving linkage to this material. (WG2.2)

A number of Short-Term Scientific Mission (STSM) exchange visits are planned, for helping in particular early-stage researchers to reach the data. These visits are essential for these researchers to fully grasp the way the data are collected and to use more sophisticated data that require special hardware to explore it (e.g. a 3D sound reproduction system). On the other hand, they will help to materialise the database. **(**WG2.3)

Indeed ongoing soundscape researches have different approaches. In a UK study over 10,000 questionnaires have been distributed with simultaneously measured sound level, and correspondingly, acoustic models for micro-scale urban areas have been developed to obtain sound map data of the case study sites. In Italy, experimental studies have been carried out using sound measurements, binaural recordings and interviews, in a range of sonic environments including 9 urban parks, a rural area, 12 squares, and the outdoor archaeological area of Pompeii. The binaural recordings were also used to perform the laboratory studies. There have been three Flemish noise surveys at home on annoyance, each with 3000-5000 samples, where an advantage is that many data are geographically referenced and many GIS layers are coupled. The "Maglev field experiment" was conducted in a house with traffic sound playback. The Berlin studies generated soundscape data combining physical, psychoacoustic and perceptive measurements in different residential areas. Macro- and microscopic approaches were chosen for sound walks, environmental screening, acoustic measurements and narrative interviews. The data collection is available in raw data and triangulated data concerning the combined approach. In France and other countries, a large number of urban squares have been surveyed, with questionnaires and aural-visual recordings.

Given the diversity of the current data, three special conference sessions are planned, to further understand the data and the establishment of the database, and to explore the synergies and differences:
(1) between cities and landscapes, given the aural-visual interactions would be rather different in two settings, for example; (WG2.4)
(2) between field studies and experimental settings, given in the latter many other sensory factors are not included; (WG2.5)
(3) between verbal data collection and analysis and physical measures, which are paid different attention by researchers in different disciplines. (WG2.6)

The three conference sessions (WG2.4, WG2.5 and WG2.6) will be organised together, in one large conference, or in three different conferences.

WG3: Harmonising

This WG will work on harmonisation of the soundscape methods of investigations and relevant indicators. First a brain-storm/think-tank is planned to seek the synergies of different definition/understanding of soundscape from different disciplines/sectors, defining a "common language". If we can consider (even if it has to be verified) that the expert discourse and vocabulary in acoustic are calibrated across languages, it is necessary to collect and compare the "common sense languages of the "new experts" (the inhabitants). (WG3.1)

Soundscape indicators will then be derived/examined/harmonised, based on multi-disciplinary analysis of various physical, psychological, social and physiological parameters, by coupling physical parameters with, for example, semantic analysis of verbal data collected from a diversity of techniques. These parameters are integrated into indicators through statistical methods as well as cognitive modelling using artificial neural networks or symbolic representations developed in sound recognition research. Indeed, multi-sectoral environmental health impact assessment, preservation of quiet areas, and the design of 'supportive environments' require new insights into the existing annoyance data and new integrative research strategies. A workshop is planned for the harmonisation of indicators/methodologies. (WG3.2) Within this context the appropriateness of health and Quality of Life outcome indicators will be assessed and summarised and a required set of moderator/mediator variables will be proposed, in a special workshop (WG3.3), probably a day immediately following WG3.2.

A special conference session on the combination of different methods is planned for overcoming the weakness and biases of single methods and approaches. Concepts and theories have to be discussed concerning the translation of subjective judgments and assessments into indicators. For that purpose, the acoustic properties of environmental noise have to be considered and combined with the empirical data. In social sciences several triangulation methods and concepts are used. The special session will consider the adaptation of these methods to soundscape investigations. (WG3.4)

A workshop is then planned, with experienced researchers from different disciplines/sectors as animators and with early-stage researchers and architects/urban planners as participants. The aim of the workshop will be to reanalyse some data collected in WG2, using the indicators harmonised in WG3.1 to 3.3. Three cases would be studied: two comparable situations in two EU cities, and another situation with specificities. Soundscape changes could also be introduced on the sites, so that before/after comparisons can be made. A standard protocol will be developed, which can be used to better assess cross-cultural and cross-contextual differences. (WG3.5)

While an important goal of the harmonisation of methods and indicators is the implementation in practice, for example, contributing to the current EU noise policy, a think-tank is planned towards the future likely standardization of soundscape measurement and evaluation. The analysis of the case studies could be used as examples. (WG3.6)

WG4: Creating and Designing

While currently soundscape is mainly a research subject, the practical implementation will be given significant attention in this Action. This WG will start from the examination of the effectiveness of design changes, in terms of planning, landscape, architectural elements, and sound components, on the creation and improvement of soundscape, considering not only the acoustic changes but also people's

perception. Two workshops are planned, one on urban soundscapes and the other on rural soundscapes. The workshops will be organised either as two separate events, or combined in a two-day workshop, each day for one topic respectively. (WG4.1 and WG4.2)

An important application of soundscape research is the preservation of the soundscapes of architectural/landscape heritages. A special conference session is planned, reviewing and comparing examples across the world in this respect. (WG4.3)

While soundscape research has mainly been for outdoor spaces, the methods may also be applicable for enclosed spaces having a function similar to urban spaces such as commercial and entertainment areas, shopping malls, airports and train stations, where the acoustic comfort and sound quality cannot be dealt sufficiently only with noise parameters as is in the current practice. A special conference session is planned to compare the two kinds of space. (WG4.4)

The development of design guidelines and good practice guide would be vital for the implementation of soundscape research. A workshop is planned to explore the ways to transfer research knowledge into practical tools and methods, including soundscape mapping method, which models auditory perception (based on the soundscape indicators) rather than just giving colour maps of noise levels, as currently required by the EU Environmental Noise Directive. (WG4.5)

This Action will heavily interact with ISO/TC 43/SC 1/WG 54 "Perceptual assessment of soundscape quality", which is just being initiated with the involvement of some participants of this Action. A workshop is planned within this Action, with other invited experts (also non-EU), so that the results from this Action (e.g. from WG3.6) can play an important role in the proposed Standard. (WG4.6)

WG5: Outreaching and Training

The research results will be disseminated to a range of audience across sectors and disciplines. To disseminate the results among stakeholders including policy makers, urban planners, architects, transportation engineers, consultants, and city communities, An awareness day on ‘Soundscape: new tendencies in urban design’, will be organised. The aim is to transfer the state-of-the-art knowledge in terms of application of soundscape approach to urban environment and quiet areas. It will take a form of a large conference (>80 people) where presentations will be made of urban design that have considered the soundscape. The examples will underline significant points such as simplicity, reduction of social costs, people acceptance. The guideline and good practice guide developed in WG4.5 will be presented. The awareness day will be preceded by an advertisement campaign on technical journals (e.g. bulletin of urban planners). (WG5.1)

Another awareness day, on ‘Listen your city’, will mainly address the community. It will have a travelling exhibition organised in at least 3 cities (North, Central and South Europe). The exhibition will present posters with information on the soundscape of cities and landscapes, binaural recordings and video projection to test ability of people to recognise their environment, audio and video examples on how the environment can change because of planning and/or people’s behaviour. The exhibition will be hosted by the participants of this Action and will be available also on the Action web-site. The awareness day will be preceded by an advertisement campaign through media. (WG5.2)

A web site will be developed for the dissemination of the planned activities. It will also cover specific matters for the Action, and will be used for Management Committee (MC) and WG business. (WG5.3)

Training for early-stage researchers is seen as a significant goal of this Action. Two special activities are planned, where early-stage researchers will take a lead:
(1) Interdisciplinary training school, combined with a think-tank, aiming at understanding various issues in soundscape research and practice. Experts from various disciplines will give training lectures in, including: (1) Psychometrics and psychoacoustics, e.g. semantic differential and factor analysis, multidimensional scaling, and direct scaling using psychophysical methods. (2) Environmental acoustics, especially on sound propagation at long distances and on indicators potentially relevant for quiet areas.(3) Epidemiological methodology, with focus on how to assess effects of environmental factors in large populations such as potential health benefits of access to quiet areas. (4) Measurement of psycho-physiological stress indicators such as galvanic skin response, blood pressure, stress hormones. A deliverable may be the material for use in future courses. (WG5.4)
(2) A think-tank among early-stage researchers, on the future soundscape, at the end of this Action. A soundscape Roadmap will be developed. (WG5.5)

A number of STSM exchange visits (in addition to WG2.3) are planned across the WGs. (WG5.6)

D.2 Scientific work plan – methods and means

The Action aims to provide a structured, but not too detailed work plan flexible enough to permit the adjustment, and also inclusion, at the implementation stage, of disciplinary perspectives and activities not foreseen during the preparation of the proposal.

As shown in Table 1, the Action has initially proposed 10+ workshops (including 4 possibly combined workshops on 2 WG tasks, and also including the two awareness days), 6+ conference sessions (including 1 conference possibly with 3 sessions from the Action), a number of exchange visits, 1 training school and 4 think-tanks. The size of workshops will vary but will typically be attended by 10-20 key participants from this Action, with a similar number of other attendees. The think-tanks will be smaller, typically with 10 participants, and the awareness days could have over 80 people. For each conference special session, typically 5 (up to 10) invited papers from the Action are planned. The outputs from each activity are described in Section D1, and Section H2 gives a generic list.

Table 1. Activity types and objectives/themes of the proposed activities, where '*' or '^' indicate two or three activities within one WG which would be held with common date & venue (see Section D1).

Activities							Themes/Objectives				
WG & Task no.	Activity type: WORKSHOP	CONFERENCE	EXCHANGE	TRAINING	THINK TANK	Tasks	UNDERSTANDING	COLLECTING	HARMONISING	CREATING	OUTREACHING
Understanding and Exchanging											
WG1.1	√					European languages, vocabularies and terminology for soundscapes	**Y**		Y		
WG1.2		√				Sound source recognition for soundscape research	**Y**			Y	
WG1.3*	√					Contributions from cognitive science and auditory perception	**Y**		Y		
WG1.4*	√					Modelling and simulation of soundscape perception	**Y**				
WG1.5^		√				Modelling different soundscapes: simulation versus real soundscape	**Y**			Y	
WG1.6^	√					Acoustical soundscape measurement	**Y**	Y	Y		
Collecting and Documenting											
WG2.1					√	Brain-storm on documentation of soundscapes		**Y**			
WG2.2	√					Soundscape data approaches/measures: data compiling/collecting		**Y**			
WG2.3			√			Exchanges of early-stage researchers (also co-ordinated with WG5.6)		**Y**			Y
WG2.4*		√				Soundscape data approaches and measures: cities vs. landscapes	Y	**Y**			
WG2.5*		√				Soundscape data approaches and measures: field vs. lab setting	Y	**Y**			
WG2.6*		√				Verbal data collection and analysis vs. physical measures	Y	**Y**	Y		
Harmonising											
WG3.1					√	Different definitions of soundscapes	Y		**Y**		Y
WG3.2*	√					Soundscape indicators: physical, physiological, human etc	Y		**Y**		
WG3.3*	√					Health and Quality of Life outcome indicators in soundscape			**Y**		
WG3.4		√				Combination techniques (triangulation, methodological triangulation)		Y	**Y**	Y	
WG3.5	√					Evaluation of common case studies	Y		**Y**		
WG3.6					√	Towards soundscape method standardization/harmonization			**Y**	Y	
Creating and Designing											
WG4.1*	√					Soundscape creation and improvement: cities				**Y**	
WG4.2*	√					Soundscape creation and improvement: landscapes				**Y**	
WG4.3		√				Preserving the soundscape of architectural heritage				**Y**	Y
WG4.4		√				Adaptation of soundscape to enclosed spaces	Y			**Y**	
WG4.5	√					Deign guidance and application of soundscapes				**Y**	Y
WG4.6	√					International standards for soundscape			Y	**Y**	Y
Outreaching and Training											
WG5.1	√					*Awareness day on "Soundscape: new tendencies in urban design"*				Y	**Y**
WG5.2	√					*Awareness days: "Listen to your city"*					**Y**
WG5.3						*Web site*				Y	**Y**
WG5.4				√		*Training school for early-stage researchers, with a think-tank*	**Y**		Y	Y	**Y**
WG5.5					√	*Future soundscape: early-stage researchers think-tank, for roadmap*	Y	Y	Y	Y	**Y**
WG5.6			√			*STSM exchange visits across WGs, managed within WG5*	**Y**	**Y**	**Y**	**Y**	**Y**

E. ORGANISATION

E.1 Coordination and organisation

PARTICIPANTS AND OPEN DOOR POLICY

This Action will foster cross-breeding in an interdisciplinary and international community of research and practice, initially with 25 participants from 18 COST countries and 7 partners outside Europe including USA, Canada, Australia, Japan, Korea, Hong Kong, and China. The initial participants, who have been intensively involved in the development of this proposal, represent a wide range of disciplines and sectors including researchers from universities and national R&D institutions, architects, consultants, policy makers, and software developers. In addition, the research participants will bring with them a cohort of end users including planners/designers and policy makers at EU, national and regional levels.

This Action will provide a flexible framework open to any countries and participants. It will permit the inclusion, at the implementation stage, of disciplinary perspectives and activities not foreseen during the preparation of the proposal. The Action will encourage participation from unrepresented sectors and disciplines and early-career researchers in particular.

MANAGEMENT COMMITTEE AND WORKING GROUPS

The Management Committee (**MC**) will consist of up to 2 representatives from each participating COST country, including early-stage researchers. The MC will meet once or twice a year (see Timetable in Section F).

A **Steering Group** (**SG**) within MC will be formed, consisting of the MC Coordinator (Chair) and the WG leaders. The SG will meet once a year, ensuring there is close communication between WGs. The Short-Term Scientific Mission (STSM) co-ordinator and the web-manager will also attend some SG meetings.

Five **Working Groups** (**WG**) will be formed (see Section D), each with a Leader, assisted by a WG Committee consisting of 4-8 MC members. Typically at least one early-stage researcher will site in each WG Committee. The activities (e.g. workshops) will normally be organised by the WG Committee, but designated experts could also be used if appropriate, therefore WG Committees could have short-term members/advisers. The WG will meet once a year.

WG5 is a special focus group. While the set-up of this designated group will ensure effective dissemination and training, WG5 Committee meetings will normally be held together with MC meetings (day before/after), given that WG5 work is normally dealt with by MC. In other words, no extra meeting budget will be needed from WG5**.** Within WG5, a STSM co-ordinator will be appointed, responsible for the proposed exchange visits, and a web-manager will also be included.

The MC, SG, and WG meetings will be held preferably in COST Office premises in Brussels, but whenever possible, the meetings will be held before or after an Action activity (e.g. workshop), to use the budget effectively. Figure 1 shows the management structure.

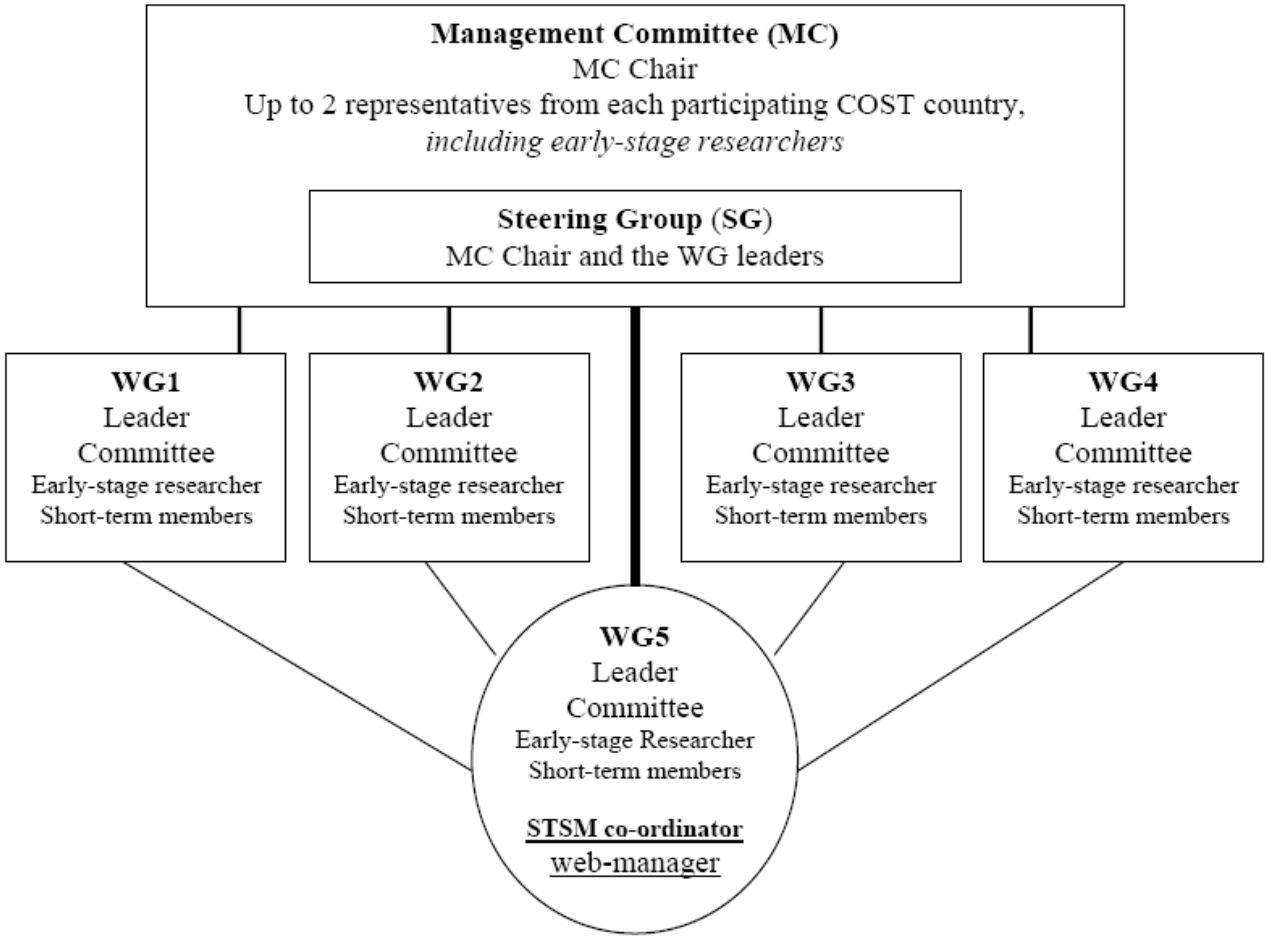

Figure 1. Management structure.

EVALUATION AND MONITORING

The MC will be responsible for coordinating the Action, with particular attention in choosing the topics of various activities and on COST country balance when drawing up lists of participants entitled for reimbursement and when distributing activities. The MC will make the scientific and budgetary assessment and decision of the application, and the MC will formally delegate relevant tasks to WG Leaders.

On the agenda of each MC, SG and WG meeting, the evaluation and monitoring of the planned, on-going and completed activities will be a standard item. Several key facets, including the relevance of topics, scientific quality, attendance, output, impact, and cost-effectiveness, will be taken into account in considering the applications of activities and in evaluating the final reports. The evaluation and monitoring will normally be made by the relevant WG, with standard forms, and overseen by the whole MC.

ORGANASATION OF ACTIVITIES

Workshops and think-tanks. The organisation of those will be dealt with by relevant WGs. They will be held in COST Office premises in Brussels if possible/appropriate. In other cases the hosts are

expected to fund the venue. While university venues will normally be used, other venues will also be considered, such as city halls for the awareness days. Where appropriate, experts in non-COST countries will be involved as invited speakers. In some workshops certain new approaches will be considered. For example, an automatic environmental sound recognition competition and a soundscape design competition will be organised associated with WG1.2 and WG5.1 respectively.

Conference special sessions. Given the interdisciplinary features of the Action, the participants are involved in a range of conferences, including common conferences for most participants, such as the International Congress on Acoustics and International Congress on Noise Control Engineering, as well as conferences in certain disciplines, such as World Congress of Architecture and conferences in semantics, sensory sciences, and cognitive sciences. Special sessions of soundscape on both kinds of conference will be organised and attended by the participants of this Action, to enhance the interdisciplinary cross-breeding of innovative and emerging scientific ideas, and to disseminate the results into a wider range of audience.

Exchange visits. A number of STSM, ranging from one week to three months, is planned through exchange visits, mainly for early-stage researchers. While some STSM with specific aims/tasks have been planned, such as WG2.3, additional STSM are expected, either independently or associated with other activities such as themed workshops. Since the situation of early-stage researchers may vary in the project duration, the Action would provide a framework rather than set up some specific topics at this stage. The Action also plans to have a small number of STSMs from a home institution in a COST participating country to a host Institution in a non-COST country. To evaluate the successfulness of the exchange visits, the researchers will be asked to write a report upon return, to WG5 Committee.

Most participants of this Action play a key role in major national research projects relating to the field, and some participants are also leading/participating relevant national networks. The Action will encourage integrating the planned activities with other relevant activities in the host country. For example, one of the MC meetings and/or workshops could be held jointly with the annual meeting of the UK NoiseFutures Network (with 30+ members from various sectors) which one of the participants is chairing.

MILESTONES

While the success of the Action will be marked by the completion of activities (e.g. Table 1 in Section D2), the major milestones will be:
(1) Working reports/publications from the WG1 workshops/conferences (Year 2-3)
(2) Establishment of the soundscape database (Year 2-3)
(3) Harmonised soundscape indicators (Year 3)
(4) Development of design guidelines (Year 4)
(5) Awareness days (Year 4)

WEBSITE

An Action specific website will be set up, with links to the COST website for general information. An early-stage researcher, associated with the Action co-ordinator or the WG5 Leader, will be appointed as web-manager at 2-4 hours/week to maintain the web site. While the web-site will mainly aim at dissemination/exploitation of the Action results, there will be a Members only area for management issues.

E.2 Working Groups

The WG organisation is described in Section E1. Note the WGs are based on the type of activities, rather than disciplines/sectors, and thus, in each WG different disciplines/sectors will be presented, ensuring interdisciplinary cross-breeding, which is vital for the Action.

While the potential WG Leaders and some WG Committee members have been initially determined during the preparation of this Action, and a range of WG activities have been initially proposed, the Action will be sufficiently flexible in terms of memberships and activities.

E.3 Liaison and interaction with other research programmes

The participants of this Action have been, and are being, involved in a range of relevant European research programmes, including large scale projects such as described in Section B4, as well as more specific projects such as the EU TOK project on urban auralisation. The participants are also involved in international research programmes such as the Worldwide University Network on Environmental Acoustics which one participant is chairing. Some of the planned activities in this Action will be jointly organised with other research programmes, attracting interests from a wide range of European countries and also, having multi-disciplinary and multi-sectoral input from other projects.

The Action will actively seek collaboration with other Actions in the relevant Domains, and this will be enhanced by the fact that some participants of this Action are also involved in the network in other Domains (and indeed this proposal has been reviewed by those participants).

E.4 Gender balance and involvement of early-stage researchers

This Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. In terms of the initial participants of this Action, there is a balance between males (60%) and females (40%).

The Action will also be committed to considerably involve early-stage researchers, for example, through the specifically planned activities for them (and led by them) including STSM exchange visits, training schools, and think-tanks. They are also strongly encouraged to organise/lead other workshops and conference sessions. They will sit in each WG Committee and also in MC.

The gender balance and the involvement of early-stage researchers will be continuously enhanced, and the MC will place this as a standard item on all its agendas.

F. TIMETABLE

The duration of the Action will be four years. The timescale is shown in Table 2 below. Within each WG, the activities are generally evenly distributed, normally over a 3-year period, reflecting progression of the activities and also reducing management load.

Table 2. Timetable of activities and committee meetings.

Tasks		Year							
		Year 1		Year 2		Year 3		Year 4	
WG1									
WG1.1	European languages, vocabularies and terminology for soundscapes	y							
WG1.2	Sound source recognition for soundscape research		y						
WG1.3*	Contributions from cognitive science and auditory perception			y					
WG1.4*	Modelling and simulation of soundscape perception			y					
WG1.5^	Modelling different soundscapes: simulation versus real soundscape					y			
WG1.6^	Acoustical soundscape measurement					y			
WG2									
WG2.1	Brain-storm on documentation of soundscapes	y							
WG2.2	Soundscape data approaches/measures: data compiling/collecting		y						
WG2.3	Exchanges of early-stage researchers (co-ordinated with WG5.6)			y	y	y	y		
WG2.4*	Soundscape data approaches and measures: cities vs. landscapes				y				
WG2.5*	Soundscape data approaches and measures: field vs. lab setting				y				
WG2.6*	Verbal data collection and analysis vs. physical measures				y				
WG3									
WG3.1	Different definitions of soundscapes		y						
WG3.2*	Soundscape indicators: physical, physiological, human etc			y					
WG3.3*	Health and Quality of Life outcome indicators in soundscape			y					
WG3.4	Combination techniques (triangulation, methodological triangulation)				y				
WG3.5	Evaluation of common case studies					y			
WG3.6	Towards soundscape method standardization/harmonization						y		
WG4									
WG4.1*	Soundscape creation and improvement: cities			y					
WG4.2*	Soundscape creation and improvement: landscapes			y					
WG4.3	Preserving the soundscape of architectural heritage				y				
WG4.4	Adaptation of soundscape to enclosed spaces					y			
WG4.5	Deign guidance and application of soundscapes						y		
WG4.6	International standards for soundscape							y	
WG5									
WG5.1	*Awareness day on "Soundscape: new tendencies in urban design" >80 people*								y
WG5.2	*Awareness days: "Listen to your city"*							y	
WG5.3	*Web site*	y	y	y	y	y	y	y	y
WG5.4	*Training school for early-stage researchers, with a think-tank*			y					
WG5.5	*Future soundscape: early-stage researchers think-tank, for roadmap*								y
WG5.6	*STSM exchange visits across WGs, managed within WG5*	y	y	y	y	y	y	y	y
Management									
MC meetings (combined with workshops etc. whenever possible)		x		x		x		x	x
WG meetings (combined with workshops etc. whenever possible)		x		x		x		x	
Steering Group meetings (combined with workshops etc. when possible)			x		x		x		x
Reports									x

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: Austria (AT); Belgium (BE); Croatia (HR); Denmark (DK); Finland (FI); France (FR); Germany (DE); Greece (GR); Italy (IT); Netherlands (NL); Norway (NO); Poland (PL); Portugal (PT); Spain (ES); Sweden (SE); Switzerland (CH); Turkey (TR); United Kingdom (UK). On the basis of national estimates, the economic dimension of the activities to be carried out under the Action has been estimated at 20 Million € for the total duration of the Action. This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

H. DISSEMINATION PLAN

H.1 Who?

The target audiences for the dissemination of the results of the Action, in particular findings and recommendations, include
(1) The COST network participants.
(2) Other researchers working in the field (outside the COST Action).
(3) Other research networks and frameworks, nationally and internationally.
(4) Professional bodies across disciplines and sectors.
(5) Standardisation bodies.
(6) Industry, widely defined, including urban planner, architects, environmental officers, manufacturers and service providers.
(7) Policy makers, at European, national government, and regional levels.
(8) Tourist boards.
(9) Conservation organisations such as English Heritage.
(10) General public.

H.2 What?

The dissemination methods/materials are list below in a generic way, noting that the detailed descriptions of the outputs from each activity are given in Section D1:
(1) General information on the Action website, which is also linked with a range of other web sites, including national and international network and project websites.
(2) Events, including themed workshops, special sessions in international and national conferences across disciplines, training schools, and awareness days involving practitioners and general public.
(3) Workshop proceedings and/or working reports, including, for example, a critical assessment of the state-of-the-art in the field. The outputs from some workshops, for example, WG3.5, evaluation of common case study sites, will be further developed into books, or special issues in scientific journals. More details are included in Section D1.
(4) Special session proceedings. The proceedings from selected conference sessions will be further developed into books or special issues in scientific journals.
(5) An integrated database of experimental and field data.
(6) Booklet with new indicators of soundscape quality to complement the END indicators.
(7) A coherent suite of measurement standards for determining soundscape quality.
(8) Good practice guidance for designing soundscape.
(9) Tools to support design and decision making, available on the Action web site or on CD distributed to practitioners free of charge.
(10) Recommendations for European/international standards.
(11) Articles in peer-reviewed scientific and technical journals, and special issues.
(12) Non-technical publications (e.g. broachers, flyers, CD with sounds) targeting to general public and policy makers.
(13) Targeted pamphlets and short briefing notes for EU policy advisors.
(14) Working documents for the Action, for the key researchers and users in the fields, on the password protected website.
(15) An e-mail network.
(16) Media materials.

H.3 How?

The dissemination and transfer of knowledge is a key value of COST and the use of results by industry, policy-makers and society is vital. This is particularly relevant for this proposed Action on Soundscape. The proposed Action will use all means, as summarised in Section H2, to communicate the findings to the research and practice community within and beyond Europe. The Action will also encourage public discussion about the work, through the planned awareness days (WG5.1 and WG5.2), for example, to ensure that the results of the research work reach the European Society and policy-makers.

A Working Group, WG5, will be set up, targeting specifically on outreaching, training, and dissemination. This Working Group will work closely with the Management Committee (MC), and also have frequently communication with other WGs. The MC will regularly review the research output of the Action and evaluate the planned dissemination.

The dissemination is enhanced by the strong international and national networks of the participants who are already on board, e.g. the European Acoustics Association, WHO , the International Institute of Acoustics and Vibration (IIAV), the Worldwide University Environmental Acoustics Network, the UK NoiseFutures network, and National French Group (CNRS 2493) on Transport Noise.

Special issues are planned in high impact journals. Special sessions are planned (1) in conventional acoustic conferences including Acoustical Society of America meetings, Internoise, and Euronoise 2009 (participant as technical programme Chair), with significant multi-disciplinary input from this Action; and (2) in conferences in other related fields, for example PLEA Conference on Sustainable Architecture and Urban Design (participants have been invited to organise sessions), and International Congress on Noise as a Public Health Problem. The Action also encourages the consideration of other conferences at the implementation stage.

The Action, in the planned activities, will invite selected international experts outside Europe, including those already identified, from USA, Canada, Australia, Japan, Korea, Hong Kong, and China. This will further enhance the dissemination globally.

Part II – Additional Information NOT PART OF THE MoU

A. LIST OF EXPERTS

Expert 1.

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D. RECENT PUBLICATIONS

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