Final Plan for using
and disseminating the knowledge

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PRIORITY 6
SUSTAINABLE DEVELOPMENT
GLOBAL CHANGE & ECOSYSTEMS
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The Periodic Report to the European Commission, describing the project activities during the fourth year (Year 4), comprises the following parts.

- Activity Report - Year 4
- Management Report - Year 4 (included in Final Management Report)
- Deliverables

In addition to this there is also the Final Report, comprising the following parts.

- Publishable Final Activity Report
- Final Plan for using and disseminating the knowledge (This report)
- Final Management Report

Deliverables are handed over to the Commission electronically and on paper as for project reports. They are also accessible on the project web site www.sustainablebridges.net for readers with access rights. Access rights may on request be provided by the project management.
1 Outline of report

This report summarises the dissemination activities undertaken during the “Sustainable Bridges” project and proposes follow on activities to ensure that the outputs are made as widely known as possible.

Chapter 2 reviews the activities undertaken during the lifetime of the project, Chapter 3 contains the proposals for continuing dissemination into the future and Chapter 4 draws some conclusions.
2 Dissemination during the project

2.1 The original dissemination proposals
The Implementation Plan proposed four main methods for disseminating the Project results:

- project publications,
- training activities during workshops,
- international conference “Sustainable Bridges”,
- a project website.

These methods have all been used during the project and other methods were adopted as the project progressed. The most important addition was the publication of a book featuring the conference presentations, supported by a CD containing “conference versions” of the main project outputs.

2.2 Actual dissemination undertaken
The main dissemination activities actually undertaken during the “Sustainable Bridges” project can be summarised as:

1. Journal and conference papers.
2. Lectures and poster presentations.
3. Workshops.
4. Publication of background documents.
5. Publication of project guidelines.
7. Organising the international conference “Sustainable Bridges – Assessment for Future Demands and Longer Lives”.
8. Project web site
9. Inter project co-operation

These activities are all described in more detail in Project Deliverable 9.4 and in the annual Activity Report submitted by the project to the European Commission and are summarised below.

2.2.1 Journal and conference papers
A total of 28 journal publications, 133 conference papers and 12 press releases were produced during the project.

2.2.2 Lectures and poster presentations
Some 20 lectures relating to the work in Sustainable Bridges have been given and the work has featured on 5 poster presentation made by students employed through the project. The project results have also been featured in the text in 6 books published during the lifetime of the project.
2.2.3 Workshops
During late 2006 and early 2007 (project years 3 and 4) each of the four main technical work packages held an interactive consultation workshop to introduce a preliminary version of their guidelines to a critical audience drawn from researchers, clients and consultants. These workshops were critical in ensuring that the final guidelines would be useful to end users.

2.2.4 Background documents
A total of 54 background documents, which support the guidelines, have been prepared. These documents provide detailed descriptions of the scientific work undertaken during the project and are available to researchers and guideline users through the project web site. The most important were also made available to conference participants on a CD which also contained the final draft versions of the guidelines.

2.2.5 Guidelines
The principal outputs from the project are four guidelines, which broadly represent the work of the four main scientific work packages. These are supported by an overall project guide, which helps to explain how the guidelines work together to achieve the objectives of the project.

2.2.6 Project book
The book “Sustainable Bridges – Assessment for Future Traffic Demands and Longer Lives” was published. This contains the papers presented during the Project Conference (see below) together with a small number of additional papers that were not presented verbally.

2.2.7 Conference
The final conference of the “Sustainable Bridges” Project, attended by over 200 people, was held during October 2007. The conference heard 41 papers, both from project participants and invited speakers, spread over 7 sessions.

2.2.8 Website
A project website www.sustainablebridges.net was established at the start of the project, principally to act as an intranet for project participants. The “home page” contained important information about the project for the benefit to non participants and has become the portal providing access to all the publicly available documents produced by the project. This includes PDF versions of the presentations from the consultation workshops, the papers from the project conference, the project guidelines and the background documents.

2.2.9 Inter project cooperation
Through the dual participation of individual project participants the project has given input to, or received input from, a number of related projects. Probably the most significant is the UIC Masonry Arch bridge project.

2.2.10 PhDs
As a result of the work within the Sustainable Bridges project 10 PhD students have received training.
3 Future dissemination

3.1 Introduction

It is planned to continue dissemination, principally using conference and journal papers but additionally by engaging with bodies such as UIC (the International Railways Union) and CEN to achieve greater penetration with clients and Standard writers. In addition, the project guidelines will be maintained from time to time and the project website will be kept active for at least 10 years.

Implementation of the project findings by bridge owners and consultants has started, but is yet to really take off. Many railway administrations are considering how best to include the important advances in their own internal management processes and this will accelerate over time. The experience of Banverket in utilising Sustainable Bridges methods to enhance the capacity of the Haparanda line linking Sweden to Finland are likely to act as a major catalyst to better dissemination and take up.

3.2 Dissemination

3.2.1 Activities undertaken after project completion

There is ample evidence of the continued support of the project partners in disseminating the results. Activities undertaken since the formal completion of the project in November 2007 include:

- An international training course organised by Banverket
- Implementation of project results during training courses for railway bridge inspectors in Poland and Germany.
- A special Sustainable Bridges session during the International Association for Bridge Management, Maintenance and Safety (IABMAS) 2008 conference in Seoul.
- Some railway partners have started to translate project documents into their native language.
- Implementation of project results in the framework of the Scientific Committee for High-Speed Railways working for PKP/PLK.
- Implementation of WP4 results in a guideline being prepared for the Danish Road Directorate concerning capacity assessment of damaged bridges.
- Implementations of selected project results in COWI’s best practice.
- Project presentation in “V-byggaren” (Swedish Civil Engineering magazine) in their special Infrastructure issue.
- Project presentation in “Dansk Vejtidskrift” (Danish Road News) in their annual special issue regarding bridges.
- Implementation of selected project results in the courses for undergraduate and PhD students at Universities.
- New research and development for the gaps identified in the project, e.g. Masonry Arches Workshop at BAM in January 2008 and the Effective Bridges FP7 submission.
3.2.2 Future activities

There is no reason to doubt that the level of activity will continue at a high level, for example papers and presentations will be delivered during the International Association for Bridge and Structural Engineering (IABSE) conference being held in Chicago in the autumn of 2008.

The overall project guide will encourage readers to utilise the four project Guidelines and report their experiences to the authors. We will encourage railway administrations to implement the guidelines into their own, and, if possible, national bridge codes. The railways will have the opportunity to choose from the results presented and those parts that fit with their existing systems. The level of internal codes and guidelines varies widely across Europe, as do assessment strategies and procedures, so not all railways will be able to use all the suggested SB systems. This can be regarded as a second stage evaluation of our results.

3.3 Maintenance of guidelines

The main report authors are all willing to continue to update their Guidelines when necessary, although the absence of specific funding will always be an issue. Dialogue has commenced with UIC to see if it will be provide funding and the possibility of including guideline maintenance within suitable FP7 proposals is also under active consideration. Modified guidelines will be uploaded onto the project web site as and when they are amended.

3.4 Enhancement of the results from Sustainable Bridges

There are still some questions that could not be answered successfully during the project. This is because the project could not cover all areas of research and new questions arose during the scientific research.

Here is a list of some questions, judged to give the greatest value to railway bridge owners, that we hope can be answered in the future and which will enhance the usefulness of the SB results.

- Improved methods for life cycle costing (LCC) of bridges particularly on existing bridges with limited historic information.
- Improvements of maintenance routines by inclusion of advanced assessment and LCC to better determine bridge service life.
- Further practical testing of SB results and guidelines to improve them and maintain the new toolboxes.
- Differentiate inspection intervals of railway bridges based on bridge type and condition.
- Development of methods for bridge replacement that can reduce down time of the network to a minimum.
- Load distribution through ballast and the influence of rail roughness to the dynamic behaviour of the bridge.
- Further research is needed to develop and proof additional assessment models that can take benefit of new low-cost monitoring technologies (automation based and wireless sensor networks) and also integrate them to bridge management systems.
- More realistic assessment methods for existing bridges, better deterioration models and understanding of the behaviour of materials and structures.
- Especially for masonry arch bridges: More realistic assessment methods to model bridges, better deterioration models and development of useful repair techniques.
4 Conclusions

Dissemination of the project aims and results has been an ongoing task during the life of the project and will continue now that it has formally finished. The main guidelines provide much good advice to bridge managers and will be updated from time to time in the light of experience and/or if the scientific knowledge underpinning them changes. The project web site will remain active for at least a further 10 years and will form the principal means of two way communication between the report authors and end users.