Annex 1

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Instrument:	Coordination Action
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Deliverable D01
"1st INQUEST Workshop – Ljubljana (Slovenia) – 21st November, 2006"
(Report)

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Report of the INQUEST workshop

"Low-Noise Road Surfaces"

Ljubljana, Slovenia, November 21st, 2006

Contents

1. Introduction

The **INQUEST** project (**I**nformation **N**etwork on **QU**iet **E**uropean road **S**urface **T**echnology) is a coordination action under the Sixth Framework Programme of the European Community (2006-2006). It is realized by a consortium consisting of the Belgian Road Research Centre (BRRC), the Danish Road Institute (DRI) and the Forum of the European National Highway Research Laboratories (FEHRL).

The goal of the project is to foster the use of low-noise pavements throughout Europe by disseminating the knowledge and experience acquired in Europe and elsewhere on that rather cost/effective means of reducing traffic noise.

This is realized by organizing workshops (6 in total) in countries which did not participate in the SILVIA project.

The first INQUEST workshop was organized in collaboration with ZAG in the ZAG premises, Dimičeva 11, Ljubljana on the 21st of November 2006 (see invitation in **Annex 1**).

This document is the official report of this workshop.

2. Participants

A full list with the names and details of the 25 participants is given in **Annex 2**, including three INQUEST presenters (G. Descornet, BRRC; P. Morgan, TRL; H. Bendtsen, DRI) and one INQUEST reporter (L. Goubert, BRRC).

3. Programme

The workshop programme is given in **Annex 3**. Copies of the slide shows handed out to the participants are given in **Annex 4**. Some pictures of the workshop are shown in **Annex 5**.

4. Question time

After each presentation the possibility was given to the participants to ask questions and/or formulate remarks. Hereunder follows a list of the questions and remarks.

- **Question: what about the freezing resistance of porous asphalt?**

Answer: porous asphalt has generally two drawbacks:

  - more problematic winter maintenance: the porous asphalt is not damaged by frost, but it absorbs much more thawing salt, making it generally more difficult to de-ice
  - porous asphalt tends to clog by dirt accumulation in the pores

These aspects are all covered by SILVIA, namely under the topic sustainability of the low noise road surfaces

- **Question: what about the reproducibility/repeatability of absorption measurements?**

Answer: this is not an easy question. The problem is that there are different measurement methods. The results are quite sensitive to the condition of the porous road surfaces. The methods pick generally up the variation of the clogging over the surface. The distance between surface and microphone appears to be essential. TRL tried to apply a dynamic method, which appeared to work well up to 30 km/h, which is of course still quite slow in most traffic situations. In SILVIA it was demonstrated that static methods yield the most precise results

- **Question: what about the signal to noise ratio of absorption measurements?**

Answer: It has been shown that the methods work quite well, so the S/N ratio should be good, but this should be further investigated

- **Question: which method was used to determine MPD values measured by ZAG?**

Answer: SCRIMTEX apparatus was used, but only classes of MPD where measured. The sand patch method was also used.

- **Remark: this illustrates that knowledge of macrotexture alone is not enough to predict noisiness of road surface**

- **Remark: tolerances of measurement methods are not fully tested in SILVIA, but they are estimated based on good expert knowledge**

- **Question: Is the SILVIA classification scheme yet definitive? Should this not be tested?**

There is a user group. In some countries the classification scheme is already tested, like in the Netherlands. There is a very simple classification scheme put into practice in Denmark, based on CPX measurements only (not complying with SILVIA scheme). There is a French work group considering implementation of SILVIA classification scheme in France. There is also interest for the system in Germany. One hopes that within one year there will be enough experience with the classification in order to start the development of a CEN standard. It is also the view of the EC that there should be developed such a standard. So a road surface (in the sense of a "product") could be sold anywhere in Europe, bearing a label complying with a CEN standard. Labelling has been quite widely used, but conformity of production procedure (COP) was not. For instance in the UK, road surface types are labelled with a certificate, but road surfaces are never checked after construction, in other words: it is not sure at all that a newly built road surface meets the acoustic properties (noise reduction) as claimed in the labelling certificate.

- **Remark: from road traffic noise spectra on porous road surfaces, it is clear that the optimal total thickness of the porous layer is about 60-70 mm**
- **Question: experiments show that there is a loss in noise reduction of two layer porous asphalt of about 7 dB(A) in the first 6 years after construction. Does it make sense to apply this type of road surface?**

Answer: it is true that the lifetime of a two layer porous asphalt is not as long as ordinary dense asphalt. If a more noisy reference surface would be taken, like DAC 0/16 instead of the DAC 0/8 which is used in Denmark, than an additional noise reduction of 2 dB(A) is obtained. However, it is indeed true that the important loss of noise reduction of two layer porous asphalt during its lifetime justifies a discussion about the use of it.

- **Question: what is the influence of wetness on the pavement?**

Answer: all the results presented up to know are valid on dry pavements. The influence of wetness on a pavement can generally be approximated as an increase of 3 dB(A) on non porous road surfaces and no influence on porous road surfaces. In Belgium about on one day out of three has some rainfall[1]. It is remarked that in practice rain has less influence than mentioned as rain also reduces the speed of the traffic, making it less noisy. A Danish study revealed that in Denmark about 11% of the time a road surface is really wet.

[1] A "rain day" corresponds to at least 1 mm rainfall over 24 hours.

- **Question: how to measure an influence of 0,5 dB(A) if the precision of a class I sound level meter is only 1 dB(A)?**

A class I sound level meter should have a precision of 0,3 dB(A) according to IEC 651 standard

5. Debate

The presentations were followed by a debate.

It was asked if the way of presenting was appropriate, if the attendees learned something and if the contents should be more scientific or more technical. There was no conclusive answer.

It was stated that lots of work has been done on the design of asphalt mixes in Slovenia, but that the awareness of the noise aspect of a road surface is quite new.

The report of the workshop will be distributed among the participants by e-mail. It is also worthwhile to follow the achievements of the numerous other EU funded programmes about road traffic noise. An overview of the finished and ongoing projects is given in the slides. The easiest way to follow these projects is by internet. It is advised to type the project name in a search engine, which will immediately find the website of the concerned project. Also some national projects are interesting: examples are the Dutch IPG project, the Danish-Dutch DRI-DWW project and the German “Leiser Verkehr” project.

It is mentioned that the Dutch IPG project does not only deal with noise abatement, but also with the cost benefit analysis of it. It is intended to improve cost effectiveness of different noise measures.

The subject of how to make roads silent has been studied the past 25 years. Basic knowledge has been acquired, but there is a lack of implementation. The carrying out of full scale experiments should be encouraged as much as possible, the aim being to persuade as much as possible politicians and technicians.

6. Conclusions

Mr Bojan Leben formulated the conclusions of the workshop as follows:

- He thanked the INQUEST team for their decision to start the series of workshops in Slovenia
- Due to the presence of a Serbian participant, the workshop can be considered as international
- We heard the European situation from theoretical research to practical instructions down to the regulation status
- The main Slovene stakeholders were present:
    - DARS motorway
    - Faculty
    - DDC consulting company
    - Institutes
    - Design and construction companies
- Much more people have been invited, but the absentees will have a second opportunity at the TRA 2000 conference in April 2008
- ZAG is equipped to do noise measurements. Results will be implemented or at least used to check test methods or approaches
- Slovene designers, consultants, institutes and construction companies are producing long lasting asphalt layers
- There is a great concern for the implementation of porous asphalts especially because of hard winter conditions

Annex 1

No: D34W-510/06-MR
Ljubljana, 18.10.2006

Mr. Guy Descornet
42 Boulevard de la Woluwe
B-1200 Bruxelles, Belgium

Subject: Invitation to INQUEST Workshop
"Low-Noise Road Surfaces"

ZAG is pleased to invite you to contribute to a workshop on "Low-Noise Road Surfaces" that our institute is organizing in the frame of INQUEST, an EU-funded project coordinated by BRRC – Belgian Road Research Centre, Brussels.
The aim of the project is to foster the use of low-noise pavements throughout Europe by disseminating the knowledge and experience acquired in Europe and elsewhere on that rather cost/effective means of reducing traffic noise. The state-of-the-art as well as prospects for the future of low-noise pavements will be presented and discussed. After the technical presentations, the Guidance Manual on the implementation of low-noise surfaces, which was developed by the European project SILVIA (2005), will be presented. At the end of the programme, we are inviting you to a discussion on the applicability of low-noise road surfaces, namely in the Slovenian context.

The workshop will take place
on November 21st, 2006 from 09:00 to 17:00 at
ZAG,
Dimičeva 12, Ljubljana (5th floor)

Please find here enclosed the Workshop programme.

For accommodation we recommend Hotel Slon Best Western where we have prebooked single rooms (http://www.hotelslon.com/en/index.htm) which is about 25 minutes by foot from ZAG, but there will be a personal cars to pick you up at 08:30 from lobby of your hotel.

Please, do your own booking as soon as possible, latest 06th of November 2006, quoting "INQUEST". I am also enclosing the map of city centre with ZAG and hotel Slon on it.

Find here some useful links about Slovenia and Ljubljana:
http://www.slovenia.info/intro/index.asp and
http://www.ljubljana.si/en/.

We look forward to meeting you on that occasion.

Workshop organizer,

Mihael Ramšak

Annex 2

Name	Position	Organization	Adress	E-mail
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Annex 3

INQUEST Workshop

"LOW-NOISE ROAD SURFACES"

LJUBLJANA, SLOVENIA

ZAG Ljubljana, Dimiceva 12 (5th floor)

21st November 2006

Topic	Time	Contribution
Registration	08:30-09:00	ZAG
Welcome and introduction to workshop objectives	09:00-09:20	Bojan Leben - FEHRL and ZAG
Introduction to the INQUEST project	09:20-09:45	Guy Descornet
Road surface influence on traffic noise	09:45-10:10	Guy Descornet
Overview of noise measurement methods and associated certification procedures	10:10-10:35	Guy Descornet
Comparative measurements of noise emission for characteristic pavements in Slovenia	10:35-11:00	Mihael Ramšak -ZAG
Coffee Break	11:00-11:30	
Classification, labelling and conformity-of-production of low-noise road surfaces	11:30-11:55	Phil Morgan
State-of-the-art of low-noise pavements	11:55-12:20	Hans Bendtsen
State-of-the-art of low-noise pavements In Slovenia	12:20-12:45	National representative
Buffet lunch	12:45-14:00	
Experimental surfaces and prospects for the future	14.00-14:25	Hans Bendtsen
Cost/benefit analysis	14.25-14:50	Hans Bendtsen
Interaction of low-noise surfaces with other noise control measures	14.50-15:15	Hans Bendtsen
Coffee Break	15:15-15:45	
Presentation of the Guidance Manual on the implementation of low-noise surfaces	15:45-16:10	Phil Morgan
Feedback from audience	16:10-16:50	With the panel
Conclusions & Closure	16:50-17:00	Guy Descornet & Bojan Leben