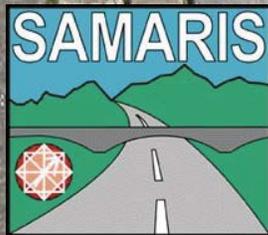


A GROWTH project in  
the 5<sup>th</sup> Framework Programme for Research and  
Technological Development of the European Union

# SAMARIS

Sustainable and Advanced Materials  
for Road InfraStructures



Proposed at the initiative of FEHRL,  
Forum of European National Highway Research Laboratories

# A new approach to the use of materials in road infrastructures

The SAMARIS project will provide new knowledge about the use of various new and alternative materials in pavements and concrete structures in the road infrastructure.

The goal is to deliver results that translate into more value for the money, reduced maintenance, more durable repairs, better protection of the environment and safer roads.



It is our ambition that results of SAMARIS can be accepted for implementation with no delay by our target groups: the road owners, the road contractors and the consulting engineers who advise them.

SAMARIS is a 4,6 Mill. euro project in the GROWTH subprogram of the European Union's 5<sup>th</sup> Framework Program for Research and Technological. Development. It runs through 2003-2005.

The GROWTH subprogram is intended to promote sustainable growth in Europe.

The initiative to propose the project was taken by of the Forum of European Highway Research Laboratories (FEHRL) as an element of its 2<sup>nd</sup> Strategic European Road Research Program

This brochure guides you through the key features of SAMARIS and provides an overview of our expectations for the next couple of years.

# Project organisation – quality and delivery of results

23 contractors from 15 countries along with their 12 subcontractors provide the expertise on which the project plan is built. Included is one university from the United States. See listing of contractors on the back page.

SAMARIS is organised as two streams of research work packages on the pavement and structures issues respectively, sandwiched between management activities and dissemination and exploitation activities. See next page.

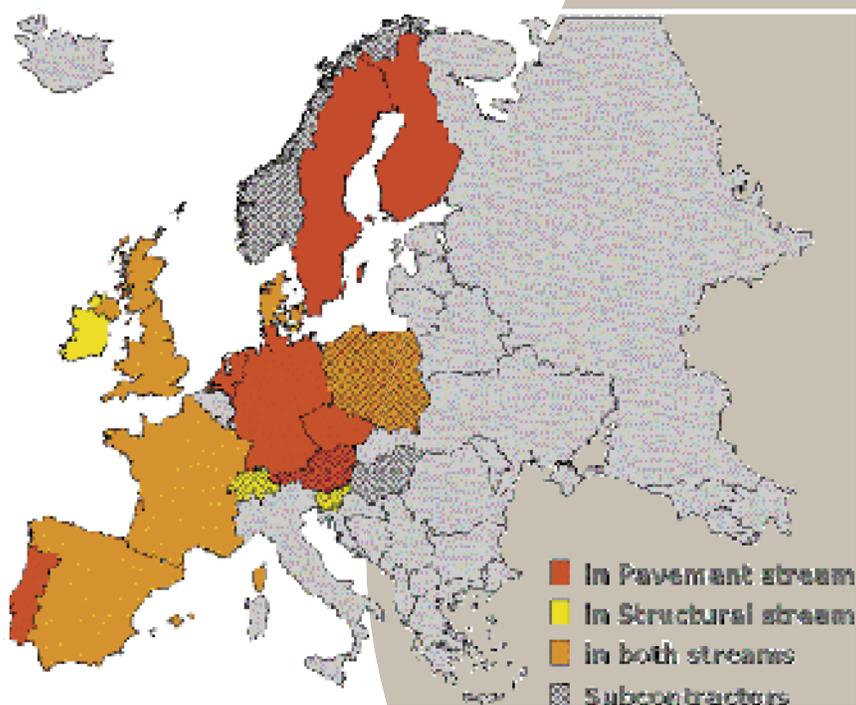
A Reference Group of End Users has been formed as a dialogue partner for the project to provide advice on setting of priorities, choice of alternative project themes and dissemination of results. It will be kept informed so as to spearhead the early implementation of project outcomes.

SAMARIS will coordinate and cooperate with other, relevant road research projects, such as FORMAT, SILVIA, BITSPEC and others, in order to maximise the benefits of all projects.

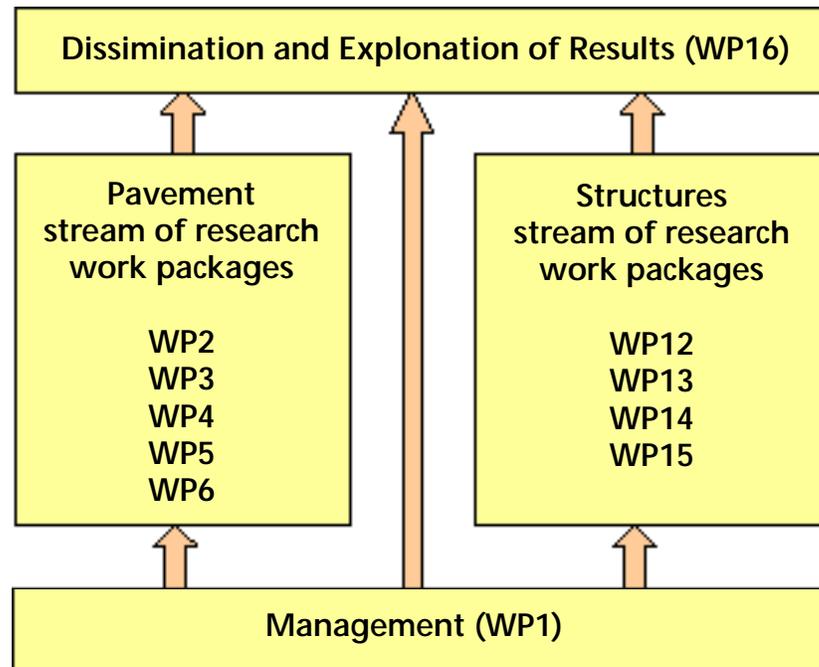
The project web-site, <http://samaris.zag.si/>, is maintained with information about the project, latest news, events and published results.

To maintain the overview and keep the pace of the project strict management and documentation procedures apply. A quality assurance system is in force. All essential research results are verified by peers and validated with the assistance of representatives of the users

After the completion of the project, early in 2006, a final seminar will be held to give a comprehensive presentation of the results to researchers and users in the European road sector.



# Project organisation of work



WP2: Review and development of pavement programme  
WP3: Assessment of materials  
WP4: Safety and environment  
WP5: Performance-based specifications  
WP6: Techniques for recycling

WP12: Strategies for rehabilitation of structures  
WP13: Corrosion Inhibitors  
WP14: High Performance Fibre Reinforced Cementitious Composites  
WP15: Survey of highway structures

# Pavements - safe use of alternative materials

A key objective of this part of the project is to encourage the use of recycled and secondary materials in pavements by detailing how such materials shall be selected and tested in order to secure satisfactory performance, environmentally and functionally.

Another key objective to support the case for more and better use of recycling and alternative materials is to prepare for the harmonization of European approaches of material specifications within the next generation of European (CEN) standards. This will involve a move away from pavement recipe specifications to pavement performance specifications and a free choice of materials.

**This part of the project has the following technical and scientific goals:**

- To produce a methodology for the assessment of functional, safety and environmental aspects for the use and re-use of any kind of material, taking into consideration the actual context of use of the materials and their interactivity with the environment.
- To draft an environmental annex to CEN products standards and to define testing protocols for the control for hazardous

components when considering the re-use of pavement materials.

- To develop mechanical models and test methods needed to derive pavement specifications based on performance in regard to functional properties.
- To produce technical guides and recommendations for a proper use of recycling techniques in road construction.



# Structures - efficient and durable maintenance

The maintenance of concrete structures, be it pre-emptive or for repair or strengthening, is a heavy burden for society not only in financial terms but also as a major potential disturbance of civil systems. The structures part of the project is specifically targeted to support the EU policy to improve highway structure maintenance through radically efficient and durable repair procedures, leading to a reduction of necessary road closures. This will

lead to considerable reduction of associated costs and increase users' safety. Special attention will be given to the Central European (CE) countries where condition of highway structures may differ from the EU situation.

## **This part of the project has the following technical and scientific goals:**

- To draw together the requirements for a sustainable maintenance strategy which satisfies the functional, safety, economic and environmental requirements for highway structures.
- To investigate the applicability of two innovative techniques: use of corrosion inhibitors and high performance fibre reinforced cementitious composites for the maintenance of bridges, tunnels, embankments, culverts and retaining walls, at different levels of corrosion attack of the reinforcement.
- To update and analyse the inventory of highway structures in the selected EEA and CE countries.
- To propose methods and procedures for improved maintenance of highway structures.



# Putting results to use

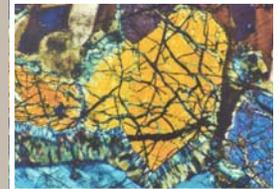
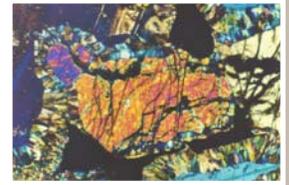
The SAMARIS project has been planned to deliver results which are suitable for practical implementation with little delay. The following deliverables are seen as particularly user oriented:

- Situation in Central European countries as regards recycling
- Methodology for assessing the possibility to re-use materials in road construction
- Environmental annexes to road product standards (draft proposals)
- Technical guide for recycling techniques in road construction
- Modelling permanent deformation of unbound and bound layers in flexible pavements and recommendations for its use in performance-based specifications
- Guidelines for optimised assessment of highway structures.
- State-of-the-art report on condition and maintenance needs of structures on highways in selected accession countries and neighbouring countries in Europe
- Specifications for the use of Corrosion

Inhibitors and High Performance Fibre Reinforced Cementitious Composites for the maintenance of structures on highways

- Guidelines on selection and use of innovative materials and techniques for the rehabilitation of structures on highways

Effective implementation of the findings of the project is expected to result in more efficient, safer, environmentally sustainable and durable maintenance of highway pavements and structures and increased traffic comfort due to fewer delays and detours caused by maintenance work.



# The SAMARIS consortium

1. Danish Road Institute (DRI)	DK
2. Laboratoire Central des Ponts et Chaussées (LCPC)	F
3. Slovenian National Building and Civil Engineering Institute (ZAG)	SI
4. Transport Research Laboratory (TRL)	UK
5. National University of Ireland (UCD)	IRL
6. Centro de Estudios y Experimentacion de Obras Publicas (CEDEX)	E
7. Swiss Federal Institute of Technology, Lausanne (EPFL)	CH
8. Vienna University of Technology	A
9. Shell Global Solutions (S.A.)	F
10. Trinity College Dublin (TCD)	IRL
11. Universitat Politècnica de Catalunya	E
12. Instituto Superior Técnico (IST)	P
13. Swedish National Road and Transport Research Institute	S
14. SIKI Ireland Ltd. (SIKA)	IRL
15. DHI Water and Environment (DHI)	DK
16. Netherlands Energy Research Foundation (ECN)	NL
17. Formequip.Ecole Nationale des Travaux Publics de L'Etat (ENTPE)	F
18. University of New Hampshire (UNH)	US
19. Ruhr Universität Bochum (RUB)	D
20. Raastof og Genanvendelse Selskabet af 1990 A/S (RSG90)	DK
21. Vysoké Učení Technické v Brně (TU Brno)	CZ
22. Road and Bridge Research Institute (IBDIM)	PL
23. Eurovia Management (EUROVIA)	F

Research Coordinator for SAMARIS structures research: Aleš Žnidarič, ZAG, Slovenia

Research Coordinator for SAMARIS pavement research: Jean-Michel Piau, LCPC, France

SAMARIS project coordinator: Jørgen Christensen, DRI, Denmark

The SAMARIS Secretariat, Danish Road Institute

attn: Ms. Sys Mikkelsen

Road Directorate, Elisagaardsvej 5

DK-4000 Roskilde, Denmark

e-mail: [sm@vd.dk](mailto:sm@vd.dk)

Phone: (+45) 4630 7108

Fax: (+45) 4630 7105