# ISAP WG6 (or 4) By-products and Secondary Materials Recycling in Asphalt Pavements

Prof. Dariusz Sybilski

Road&Bridge Research Institute, and

Lublin University of Technology

# Work Plan Proposal: The Objective

- Promotion of use of alternative materials (industrial by-products and secondary materials) in road asphalt pavements constructions
  - Disposal of industrial by-product or secondary materials - one of the most important topics worldwide
  - One of the option is application in road construction
  - Reduction of the consumption of natural aggregates
  - Saving the landfill areas
  - Administrative pressure, for instance by means of taxes (on materials sent to landfill or on natural aggregates)
  - Stimulation of the use of alternative materials
- Use of alternative materials in the asphalt road pavements:
  - Environmental and technical aspects
  - Need for the evaluation of impact on environment as well as mechanical properties to meet the requirements established for natural materials
  - In many cases of alternative materials specific tests and requirements are requested
  - Functional, performance based test methods of materials, may allow for more objective alternative material evaluation in comparison to natural material
- Appointment and promotion of those test methods

# Work Plan Proposal: Basis of work

- The basis of work of WG6 will be literature review, and monitoring the development in Technical Standards, Specifications, Guidelines, and Law Regulations
- Special attention to international collaborative projects completed:
  - Marginal materials. State of the Art report. Permanent International Association of Road Congresses, Paris, PIARC (1989)
  - Recycling strategies for road works. OECD (1997)
  - ALT-MAT a collaborative research project partly funded by the European Commission under Framework Programme IV (1998-1999)
  - SAMARIS (Sustainable and Advanced MAterials for Road InfraStructure) project, funded by the European Commission under the Fifth Framework Programme (2003-2007)

# ALT-MAT

- The project addressed improvements to:
  - the performance of all highway materials
  - their efficient use and reuse
  - the development and use of new materials
  - encourage the wider use of alternative materials in road construction
- Result: reduction of the consumption of natural aggregates and the environmental impact of the disposal of the alternative materials
- The aim of the project was to provide information to bridge the gap between laboratory tests and field behaviour
- The objective was to define methods by which the suitability of alternative materials for use in road construction can be evaluated
- The methods covered the mechanical properties, functional requirements, leaching potential and long-term stability of the materials and concentrated on unbound granular materials

# ALT-MAT

- The results of the ALT-MAT project are very positive and provide support for the use of alternative materials in road construction
- The case studies show that the materials perform as well as natural aggregates, and often better than suggested by standard laboratory tests
- Methods for testing the mechanical and hydrodynamic properties of alternative materials and their leaching behaviour are listed, and a model for assessing the environmental impact on groundwater quality on a site-specific basis is presented
- It is important that highway authorities and environmental regulatory authorities are made aware of this toolkit of methods and apply them in a national context
- This can be achieved through the national seminars, publication of the final report in book form and on the ALT-MAT website, articles in technical journals and presentations at suitable conferences and seminars

# SAMARIS Project

- Forum of European Highway Research Laboratories FEHRL Project
- SAMARIS merged two separate proposals:
  - MAP about materials used in highway pavements
  - STRIM about innovative materials used for maintenance of highway concrete structures
- Project commencement date was the 1st of January 2003 and the duration of the project was 36 months

# SAMARIS Pavement stream of research work packages

- WP 2 Review, development of pavement programme
- WP3 Assessment of materials
- WP4 Safety and environment
- WP5 Performance-based specifications
- WP6 Techniques for recycling
- WP16 Dissemination and Exploitation of Results

# SAMARIS Work Package 3

- Choice of materials:
  - Colliery spoil
  - Air cooled blast furnace slag
  - Ground granulated blast furnace slag
  - Steel slag
  - Coal fly ash
  - Coal bottom ash
  - Building demolished by-products
  - Municipal solid waste incinerator bottom ash
  - Scrap tyres
  - Waste glass
  - Foundry sand

# SAMARIS Deliverables

- DE04: Existing specific national regulations applied to material recycling
- DE05: LITERATURE REVIEW OF RECYCLING OF BY-PRODUCTS IN ROAD CONSTRUCTION IN EUROPE
- DE07: State of the art for test methods to detect hazardous components in road materials for recycling
- DE09: Report on the critical analysis of European documents. Critical analysis of documents from Europe and United States with special reference to assessment of alternative materials
- DE12: Report recommendations for mixing plants for recycling works (characterization, elaboration plants, uses in road construction of by products)
- DE15: Review of the state of art in road and other industry by-product use in road construction and rehabilitation in the Central and East European countries
- DE16: Methodology for assessing alternative materials for road construction
- DE23: Procedures for indentifying hazardous components in materials for asphalt
- DE24: Environmental annexes to road product standards
- DE29: Guide on techniques for recycling in pavement structures

# Work Plan Proposal: The Goals

- Up-to-date literature review, including development in standards and law regulations - based on international inquiry
- Workshop on by-products and secondary materials in asphalt pavements (date and venue will be decided later)

# Thank you