

## Preliminary Schedule

### April 2014

Start of project  
Project introduction during TRA 2014

### April 2015

Paper compilation completed

### August 2015

Correlative performance properties identified

### September 2015

Proposal of bitumen performance specifications  
End of project

### April 2016

Workshop/presentation of results at TRA 2016 conference

### June 2016

Presentation of results during Eurasphalt&Eurobitume Congress 2016

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## FUNDBITS PARTNERS



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University of Kassel



Belgian Road  
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Slovenian National  
Building and Civil  
Engineering  
Institute (ZAG)



TRL Limited

École Polytechnique  
Fédérale de  
Lausanne (EPFL)



European  
Asphalt Pavements  
Association (EAPA)

Laboratório Nacional  
de Engenharia  
Civil, I.P.



Turkish Asphalt  
Contractors  
Association  
(ASMUD)

Vienna University of  
Technology



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## Functional Durability-related Bitumen Specification (FUNDBITS)

### CEDR Transnational Road Research Programme (CEDR-TRRP) 2013



Conférence Européenne  
des Directeurs des Routes  
Conference of European  
Directors of Roads

## Sponsors:

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## Background

More than 80 % of the Europe Road Network is paved with asphalt materials. Energy efficient asphalt pavements can be built by using durable pavement materials in order to avoid or postpone maintenance and rehabilitation works. To improve the durability of asphalt, performance-based (P-R) specifications were introduced for asphalt mixtures. Although the durability of asphalt mixtures is highly dependant on the properties of the bituminous binder, these are specified based on empirical test procedures which were devised around 100 years ago and they do not allow a prediction of the asphalt mixture performance, particularly for polymer-modified binders. In addition, the ageing of bitumen, its durability and recyclability are not taken into account by European specifications in terms of performing functional testing after short- or long-term ageing. For asphalt mixtures, performance-based specifications were introduced with EN 13108-series in 2006, whilst performance-based bitumen specifications are still not implemented in EN 12591 (paving grade bitumens), EN 14023 (polymer modified bitumens) and EN 13924 (hard and multigrade paving grade bitumens).

In the FunDBitS project, new internationally available data will be reviewed in order to develop performance-based bitumen characteristics which may be introduced into future versions of bitumen specification standards EN 12591, EN 14023 and EN 13924. The correlations found may also be applied for special binder products containing various additives (e.g. waxes or crumb rubber). By having all stake-holder parties involved in the project, including national road research laboratories, universities, asphalt industry and bitumen producers, the required discussions on the feasibility of test procedures and the results for the specification will shorten the subsequent discussions in the CEN TC336 committees.

The data sources will cover the whole of Europe and most asphalt mixture types will be addressed in the evaluation. This will allow the development of climate-specific specification requirements which can be applied throughout Europe.

## Key project objectives

The FunDBitS project new data sources will be evaluated to propose a system for performance-based bitumen specifications based on:

- changes of EN 12591, EN 14023 and EN 13924 for bitumen characteristics applied for performance-based specifications;
- changes of bitumen test procedures in order to be more precise on the test conditions and to improve the test precision;
- proposed improvements for EN 13108, including suitable bitumen performance characteristics for selected asphalt mixture types.



### Work Packages

**WP1** (Jan Valentin, CTU Prague)

**WP2** (Stefan Vansteenkiste, BRRC)

**WP3** (Konrad Mollenhauer, University of Kassel)

**WP4** (Cliff Nicholls, TRL)

#### **Task 4.1 Permanent deformation (rutting)**

*Lead partners: LNEC, TUV*

#### **Task 4.2 Stiffness**

*Lead partners: TRL, CTU*

#### **Task 4.3 Low temperature cracking**

*Lead partners: UoK, ZAG*

#### **Task 4.4 Fatigue cracking**

*Lead partners: CTU, EPFL*

#### **Task 4.5 Binder/aggregate interaction**

*Lead partners: BRRC, Nynas*

**WP5** (Nicolas Bueche, EPFL)

## Project outputs

All project outputs, once delivered to and approved by the client, will be available on the project website at:

[www.fundbits.eu](http://www.fundbits.eu)

## Work Packages

### **WP1 :**

- To coordinate and manage the project, follow the set working programme & deliverables to assure reaching the objectives of this project.
- To coordinate the dissemination of all results and prepare a final international workshop on the project results, including the relevant CEN committees, Eurobitume & EAPA.
- To ensure good quality of the work and to gain results in an effective, rational and sustainable way.

### **WP2:**

- To clearly identify what relevant information, needed to establish relationships between binder properties and/or corresponding test methods and mixture/pavement performance in the field, are available.
- To enable the gathering of latter information in WP3 and, facilitate its further processing into a single database to serve as a tool to select data accordingly to a specific topic to be reviewed in WP4.

### **WP3:**

- To collect available data on P-R bitumen characteristics in combination with asphalt properties to allow the correlation between these properties.
- To assess available data sources according to test methods and test parameters, binder type and asphalt mix design. For each data source, available test values will be implemented to the database which will allow the combined correlation analysis for similar data sets.

### **WP4 :**

- To identify the relevant information available in the literature, combine and sort that on each of the major aspects of asphalt performance.
- To review the relationship between the bitumen and asphalt properties in particularly its durability and service life, with due consideration for the reliability of the test methods and presence of other factors on the asphalt properties. The work will be split into five tasks for each of the main asphalt properties.

### **WP5 :**

- Based on the observed relations between bitumen characteristics and obtained performances, some specification requirements will be drawn up. These do not aim at being normative but propose some limit values that can be considered when choosing binders during the asphalt mix design. The proposed specification will also take into account the expected conditions (climate, traffic) and, thus, consider various specification levels. The WP is divided into the same tasks, as in WP4 corresponding to the main asphalt properties analysed.