



## Session 2 **DESIGN**



Moderator:  
Luís Picado Santos  
**DECivil - IST**

Road Pavements: Materials, design and performance  
Lisboa, LNEC, 25 March 2010



**Road  
Materials  
and  
Pavement  
Design**

## Do we, actually, perform pavement design?

- > Pavement design is the process of selecting pavement layer types and thicknesses in order to withstand expected traffic loads and environmental conditions in a cost-effective manner

- > Pavement design is a process used by us, pavement engineers, to determine the structure that will be used for a given project. We pray in a daily basis with great hope that the structure that we designed last time ended up being the best one for the network.





# Which design parameters are really achievable?

- > Traffic
- > Environmental conditions
- > Materials' composition
- > Layers' behaviour



- > A road pavement is the trickiest to design civil engineering structure
- > For instance, a bridge designer only need to fit a safety factor (at least 5 times the hugest distress case known...) to the response of a pretty fair response model usually used. A pavement designer is fired if he just mentioned that it will be better to do something similar in order to get a lower risk to better address uncertainty.

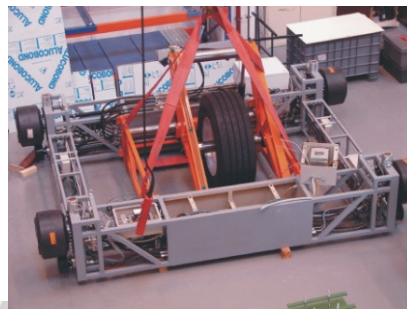


# What can we do?

## > Mechanistic-Empirical Design

- Better translation of loading conditions and better parameterized behaviours during life cycle, based on real world data and improved modelling (MEPDG – “Mechanistic-Empirical Pavement Design Guide” from FHWA – USA)
- Verifying effectiveness through “after-design” pavement behaviour follow up for each region and local conditions, defining local/regional adaptations

## > Research





## DESIGN - agenda for today

### > 14:15-14:35

- Long term flexible pavement performance modelling, Andrew Collop

### > 14:35-14:55

- Tyre-pavement contact stresses, Morris de Beer

### > 14:55-15:15

- Assessment of boundary-element method for modelling the structural response of a pavement, Arminda Almeida and Luis Picado Santos

### > 15:15-15:35

- Advances in pavements modelling from in situ load tests, José Neves, Pedro Domingos and Maria de Lurdes Antunes

### > 15:35-15:55

- Do models really work? Verification and validation in pavement engineering, William Buttlar

### > 15:55-16:15

- Discussion



LABORATÓRIO NACIONAL  
DE ENGENHARIA CIVIL



Road  
Materials  
and  
Pavement  
Design



CENTRO RODOVIÁRIO PORTUGUÊS

# QUESTIONS

- Long term flexible pavement performance modelling, Andrew Collop
- Tyre-pavement contact stresses, Morris de Beer
- Assessment of boundary-element method for modelling the structural response of a pavement, Arminda Almeida and Luis Picado Santos
- Advances in pavements modelling from in situ load tests, José Neves, Pedro Domingos and Maria de Lurdes Antunes
- Do models really work? Verification and validation in pavement engineering, William Buttlar

