



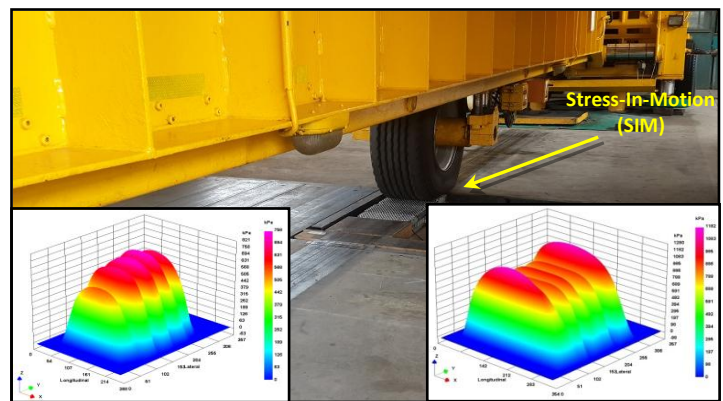
## Observations, analyses and developmental technologies associated with a full-scale Heavy Vehicle Simulator (HVS) on pavement structures



**Morris DE BEER** is a former Professor *Extra-ordinary* at the University of Pretoria (South Africa). At the CSIR, he is a Principal Research and Professional Engineer active in the areas of flexible and rigid road pavement materials, new and rehabilitation design and analysis methods of road pavements. Since 1976, his research includes Accelerated Pavement Testing (APT) with the Heavy Vehicle Simulator (HVS). During the last 10 years, he focussed primarily on tyre-pavement interaction with the locally developed tyre-road pavement Stress-In-Motion (SIM) system. He is an inaugurate member and Associated Editor of the RMPD *International journal* since 1999.).

### ABSTRACT

The presentation is concerned with historical research in South Africa using amongst others full scale Heavy Vehicle Simulator (HVS) devices. New failure law(s) such as Crushing and Fatigue were defined both quantitatively and phenomenologically for lightly cementitious layers, differentiating between “dry” and “wet” test conditions. This led to improved mechanistic-empirical (ME) design and evaluation methodologies, including slip between layers. In addition the Stress-In-Motion (SIM) technologies for defining traffic inputs into M-E design method(s) were investigated in great detail. Of the products in the focus of pavement research includes the following: Dynamic Cone Penetrometer (DCP) methods (including software packages), the Rapid Compaction Control Device (RCCD) for compaction control, even on trench re-in statements. On the recycled material side developments resulted in an advanced laboratory twin-shaft pugmill mixer technology, currently available in practice. The skillful use of above aspects allows pavement and material engineers to assess rural highways and pavements (also lower class such as “Low Volume Roads” (LVR)) in a much more technical focussed way. It is based on viewing and analysing pavements as structural systems which respond to traffic and environmental loading influences. In particular, the presentation emphasis will be on the HVS & SIM technology, as well as the Strain Energy of Distortion (SED) pavement response parameter.



*Note: All acronyms used above are currently searchable by Google.*