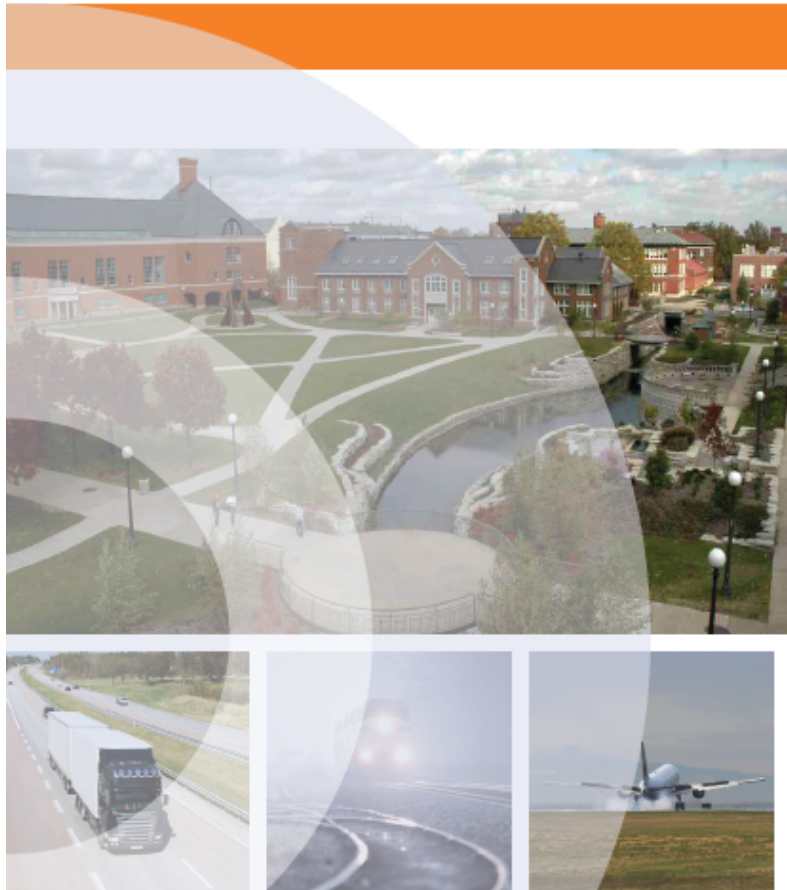


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Edited by Erol Tutumluer and Imad L. Al-Qadi

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Bearing Capacity of Roads, Railways and Airfields (BCR²A'09)

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Preface

This conference is the eighth conference in the series started in Trondheim, Norway in 1982 and arranged at four-year intervals under the title “Bearing Capacity of Roads and Airfields – BCRA.” In the sixth BCRA Conference in Lisbon, Portugal, a third component on railway track was added in the scope as a vital element of transportation infrastructure worldwide. However, since then the acronym BCRA remained the same. For the first time, this eighth conference uses the acronym BCR²A to emphasize the infrastructure problems that all three transportation modes have in dealing with the bearing capacity challenges of highway and airfield pavements and railroad track structures.

The 8th International BCR²A’09 Conference focuses on issues pertaining to the bearing capacity of highway and airfield pavements and railroad track structures and aims to promote efficient design, construction and maintenance of the transportation infrastructure. Bearing capacity issues are steadily changing because of the ever-increasing traffic volumes and weights, which require stronger and more durable pavements, railroad track structures and superstructures. New materials and methods are being developed and new aspects of design and material utilization are brought into focus, which demand a better transition into implementing mechanistic concepts in designing pavements and railroad track structures. The BCR²A’09 conference will provide such a forum for new concepts and innovative solutions.

This proceedings book includes submissions to the conference in the areas of subgrade soils, granular materials, asphalt mixtures, in-situ measurement techniques and developments, modeling and methods of functional testing, backcalculation analyses of deflection measurements, new and/or innovative techniques in compaction and construction, structural evaluation and performance prediction, structural design systems for new construction and rehabilitation, bearing capacity designs for challenging conditions and load effects, bearing capacity designs for climatic conditions, reinforcement of structural layers, utilization of recycled materials, railroad track structures, full-scale testing, and case histories of roads, railways, and airfields. At least two, but often three reviewers, including members of the Scientific Committee, subjected all submitted contributions to an exhaustive refereed peer review procedure. Based on the reviewers’ recommendations, those contributions which best suited the conference goals and objectives were chosen for inclusion in the proceedings.

This international conference is coming to the United States for the second time; the first being the successful 1994 conference held in Minnesota. Taking this into consideration, the University of Illinois at Urbana-Champaign (UIUC) was in a unique position to host this conference. Illinois is at the crossroads of the U.S. transportation network and the highly ranked Civil and Environmental Engineering Department at UIUC along with its prominent transportation centers and programs have a long-standing reputation of cutting edge research on transportation infrastructure.

The UIUC Newmark Civil Engineering Laboratory houses the Center of Excellence for Airport Pavement Technology (CEAT) and the Association of American Railroads’ Affiliated Research

Laboratory. The Advanced Transportation Research and Engineering Laboratory (ATREL), in Rantoul, Illinois, houses the Illinois Center for Transportation (ICT), one of the largest centers in the UIUC College of Engineering. These centers and laboratories are the highlighted sites for technical tours during the BCR²A'09 Conference with a post conference visit to the Chicago O'Hare International Airport. During the BCR²A'09 event, four half-day pre-conference workshops have also been organized on climatic effects on pavement infrastructure, pavement interlayer systems, railroad track design including asphalt trackbeds, and designs for new and rehabilitated airport pavements.

The Editors would like to thank the Scientific Committee members and individual reviewers for their dedication and contributions of their time and efforts to ensure the high technical quality of the accepted papers. In addition, sincere thanks are extended to Ms. Elaine Wolf for collecting abstracts and Ms. Sinem Ertunga Tutumluer for ensuring that final manuscripts were in accordance with the publication format requirements. The guidance and continuing input from the International Advisory Committee members were essential in planning of this conference, and highly appreciated. Finally, we would like to gratefully acknowledge the Organizing Committee members for their help, suggestions and contributions to the management of the Conference affairs; especially Chris Barkan, Bill Buttlar, Riley Edwards, Dave Lange, Dave Lippert, and Jeff Roesler.

Erol Tutumluer
Imad L. Al-Qadi

Urbana, Illinois, June 2009

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Proceedings Back Cover

Internationally, much attention is given to bearing capacity challenges of highway and airfield pavements and railroad track structures. The Eight International Conference on the Bearing Capacity of Roads, Railways and Airfields (BCR²A'09), held in Champaign, Illinois on June 29-July 2, 2009, focused on issues pertaining to the bearing capacity of highway and airfield pavements and railroad track structures and provided a forum to promote efficient design, construction and maintenance of the transportation infrastructure. This book is a collection of papers from the Conference, and includes contributions on a variety of topics:

- Subgrade Soils
- Granular Materials
- Asphalt Mixtures
- In-situ Measurement Techniques & Developments
- Modeling & Methods of Functional Testing
- Backcalculation Analyses of Deflection Measurements
- New and/or Innovative Techniques in Compaction & Construction
- Structural Evaluation & Performance Prediction
- Structural Design Systems for New Construction & Rehabilitation
- Bearing Capacity Designs for Challenging Conditions & Load Effects
- Bearing Capacity Designs for Climatic Conditions
- Reinforcement of Structural Layers
- Utilization of Recycled Materials
- Railroad Track Structures
- Full-Scale Testing
- Case Histories

Bearing Capacity of Roads, Railways and Airfields is particularly of interest to academics, researchers, and practitioners involved in geotechnical, pavement and railroad engineering disciplines and concerned with the many issues pertaining to the bearing capacity and mechanistic based design of highway and airfield pavements and railroad track structures.