

International Conference on Advances in Highway Engineering & Transportation Systems

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Abstracts

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Keynote Speakers' Profiles
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Prof. Sanjaya Senadheera
Director of the Texas Tech University Center for
Multidisciplinary Research in Transportation

Dr. Sanjaya Senadheera serves as Director of the Texas Tech University Center for Multidisciplinary Research in Transportation (TechMRT) and as Associate Professor of Civil, Environmental & Construction Engineering. His research interests are in Infrastructure Materials and Systems, Sustainable Design and Transdisciplinary Education. Dr. Senadheera obtained his BSc in Civil Engineering with honors from the University of Peradeniya in 1981 and joined State Engineering Corporation (SEC) of Sri Lanka. He left SEC as a Chartered Engineer while serving as Works Manager at its Concrete Precast Yard. He joined Data Management Systems (Software) Ltd. In Sri Lanka as a Business Analyst before leaving Sri Lanka to pursue postgraduate studies at Texas A&M University in College Station. After obtaining his Ph.D. in civil engineering, he joined Texas Tech University (TTU) as a Research Associate and currently serves there as a tenured faculty member, during the past 20+ years at TTU, Dr. Senadheera's research has generated over \$12 million in sponsored funding to the university. In his current role as Director of TechMRT, he oversees the university's transportation research program. In his research role, Dr. Senadheera currently heads its Novel Flexible Pavement Materials research group comprising of seven faculty members, three postdoctoral fellows, and eight doctoral students.

Keynote Address

New Paradigms for Transportation Infrastructure: Trends, Sustainability and Education

Transportation is one of the primary drivers of a country's economic vitality, and careful planning and execution of transportation infrastructure projects based on fundamental principles are vital, mainly due to their high cost and resource intensity. Rapid, exponential growth in national and regional economies of the world have placed severe strains on the supply of resources for transportation projects and the resulting impacts on environmental quality. Furthermore, ineffective infrastructure solutions have burdened many economies with poorly functioning transportation systems and mountains of debt. Also, rapid developments in advanced transportation technologies and energy systems and the increased significance of extreme climate events have added to the level of system complexity. The novel technologies and energy systems, though promising, are not likely to be fully implemented for a decade or more, but the challenges posed by resource limitations and deteriorating environmental quality call for the creation of a bridge between traditional transportation systems and advanced systems of the future. Development of novel and sustainable material systems is an essential part of this bridge to a sustainable future for transportation and the humanity in general. These developments may be in the form of new infrastructure life-cycle paradigms, rapid construction technologies, novel material systems including natural renewable materials, significant reductions in material intensity and improved infrastructure resilience. The increased complexity of transportation infrastructure systems also requires new approaches to study the impact of transportation systems on communities and societies with a focus on humanism and quality of life. This new dimension of humanism calls for a major transformation in the way we need to educate and train tomorrow's transportation workforce that is sensitive to not only the engineering and productivity of systems but also their impact on society. This lecture will address the key issues indicated above, along with illustrations of the work by Dr. Senadheera's research group at Texas Tech in the area of novel pavement material systems.



Prof. Feipeng Xiao
College of Transportation Engineering
Tongji University
China

Dr. Feipeng Xiao is a Professor of “Recruitment Program for Young Professionals” in College of Transportation Engineering at Tongji University, China, and an Adjunct Associate Professor at University of Alabama, USA. He is a Registered Professional Engineer at Maryland with almost 20-year international experiences in structural design, pavement engineering, geotechnical engineering, and water resource.

His research interests are focus on asphalt materials, solid waste applications, energy saving and environmental friendly materials, asphalt modifications and Nano techniques. Prof Xiao is working the Editor of Elsevier-Construction and Building Materials, Associate Editor of ASCE-Journal of Materials in Civil Engineering and Editorial Board Member for other three science citation indexed (SCI) journals. He is a reviewer serving over 20 international Journals. Prof Xiao published over 100 papers in international circulated Journals. He received the best paper award from International Conference and is one scholar of “the most cited Chinese Researchers in Civil and Construction Engineering” by Elsevier at 2014, 2015 and 2016.

Prof. Xiao was issued seven Chinese patents and co-published two books. He is serving/served Principle Investigator (PI) or Co-PI for over 10 projects funded by Chinese and US governments recently. Prof. Xiao is frequently invited to serve the Scientific Committee and Chair by International Conferences hosted by organizations in USA, China, Korea, and India etc. He is also the committee member/member of several international pavement/materials related associations.

Keynote Address

100-Year Durability of Pavement Engineering Materials

Recent years, rapid improvements of the infrastructures in China result in the social and economic developments. However, these growths brought many issues since the quality controls were somewhat ignored due to various reasons. Therefore, it is very indispensable to conduct the long-term performance infrastructure systems for our next generations. The durability of highway pavement is always an essential topic for the engineer and researcher. However, how to achieve this objective is challenging our pavement investigators. In this topic, the pavement engineering materials are selected and studied. Some innovative techniques, novel materials, and state of the art knowledge will be introduced to accomplish the objective of 100-year durability of pavement engineering materials.



Dr. John E. Abraham
HBA Specto Incorporated
Calgary, AB, Canada

John E. Abraham, PhD, MSc, PEng is one of the principal developers of the PECAS framework for integrated land use, transport, and economic modelling. With colleagues at HBA Specto and elsewhere he has built simulation models in Canada for the cities of Calgary, Edmonton and the Province of Alberta; in the United States for the cities of San Francisco, Sacramento, San Diego, Atlanta, Baltimore, Los Angeles and the states of California and Oregon; and internationally for Brisbane, Australia, Caracas, Venezuela, and Wuhan, China. John's focus is on behavioural theory, mathematical representations, calibration techniques, forecasting, and the long-term analysis of policy and infrastructure.

Keynote Address

Long Term Strategic Planning Simulations: Land Use and Transport Models from Alberta, Canada and Elsewhere

Simulation models of the future guide us in optimal transport investments and policy. A computer representation of the future spatial economy of the region, showing future households and future businesses interacting through transportation, allows us to plan for the true purpose of transportation.

The classic representation has three sub models: economic, land use, and transportation. The economic model represents the way households and businesses interact in their pursuit of well-being and profits, and their resulting reliance on transportation. The land use model represents the location of activities on land, as well as the development of buildings and other structures to support the housing and production needs of society. The transportation model represents the detailed use of the future transportation system. The three models together show how the transportation system shapes the future of the region's development and economy, and how the transportation system will be used in the future.

Examples from around the world are presented, showing the use of the models to predict and describe congestion, development, economic benefits, and household equity.

The model of Alberta, in Canada, currently undergoing development, is described. It contains five sub models for transportation demand, including an Activity Based Model (ABM) for daily household travel. The economic model has a detailed representation of industry types, and a micro simulation of development patterns on 2 million parcels.



Session 1 (Contd.)
Prof. Animesh Das
Department of Civil Engineering
Indian Institute of Technology Kharagpur, India

Prof. Animesh Das is a Professor in the Department of Civil Engineering, IIT Kharagpur, India. He completed his M.Tech and Ph.D. from IIT Kharagpur, India, in 1993 and 1995 respectively. Prof. Das's work is centered on pavement material characterization, material level evaluation. As a researcher, he is interested in both theoretical and experimental aspects and he has published a number of papers in scientific journals of repute. He has co-authored a text book titled "Principles of Transportation Engineering" published by the Department of Public Works, Government of West Bengal in 2007 and another book titled "Advanced Pavement Materials" published by CRC Press - Taylor and Francis Group in 2014. He has received numerous awards and honors for his contribution to the field. He received the Young Engineer Award in 1994 from Indian National Academy of Engineers (INAE), New Delhi, India. He also received the Young Engineer Award in 2006 from Indian National Academy of Engineers (INAE), New Delhi, India. He is also a recipient of the Young Engineer Award in 2006 from Indian National Academy of Engineers (INAE), New Delhi, India. He is also a recipient of the Young Engineer Award in 2006 from Indian National Academy of Engineers (INAE), New Delhi, India.

Highway Engineering

Session 1

**Session Keynote 1:****Prof. Animesh Das****Department of Civil Engineering
Indian Institute of Technology Kanpur, India**

Prof. Animesh Das is a Professor in the Department of Civil Engineering, IIT Kanpur, India. He completed his M.Tech and Ph.D., both from IIT Kharagpur, India, in 1993 and 1998 respectively. Prof. Das's area of interest is pavement material characterization, analysis, design and evaluation. As a researcher, he is interested in both theoretical and experimental studies and he has published a number of papers in scientific journals of repute. He has co-authored a text book titled 'Principles of Transportation Engineering' published by the Prentice-Hall of India (currently known as PHI learning) in 2003 and authored another book titled 'Analysis of Pavement Structures' published by CRC Press - Taylor and Francis Group in 2014. He has received numerous awards in recognition to his contribution in his field. To name a few, Young Engineer Award in 2004 from Indian National Academy of Engineers (INAE), IRC-Pt. Jawaharlal Nehru Birth Centenary Award in 2006 from Indian Roads Congress (IRC), Fulbright-Nehru Senior Research Fellowship in 2012 by United States India Educational Foundation (USIEF) etc.

Keynote address**Imaging Studies on Aggregates and Asphalt Mix – From Microscope to Camera**

The size of aggregates used in asphalt mix varies from a few microns to a few centimeters. Thus, different imaging equipment is necessary to capture information at different scales. In this talk I shall discuss about our recent explorations with scanning electron microscope, optical microscope, desktop scanner and camera on aggregates and asphalt mix. Some ideas and results related to shape characterization of aggregates, asphalt binder adsorption in aggregates, estimation of aggregate size distribution, nature and effect of aggregate distribution (ranging from coarse aggregate to filler) on the response of asphalt mix etc. will be presented.