# Workshop & Lectures on Pavement Engineering, Maintenance and Management

**Organised by:** **Centre for Infrastructure Engineering and Management and School of Engineering, Griffith University Gold Coast campus**

**Date:** **April 14-17, 2009**
**Venue:** **Building G30 1.09**
**Griffith University Gold Coast Campus**

## See "Registration form" for daily registration

**PLEASE NOTE THAT ONLINE REGISTRATION IS NOW AVAILABLE**
**https://www.conferenceonline.com/index.cfm?page=booking&object=conference&id=13567&categorykey=A2231E87%2D338F%2D4610%2DBA49%2D9C70E5BD6A54&clear=1**

**For additional information please contact (preferably by e-mail)**

**Prof. A. S. Balasubramaniam,**
**Griffith School of Engineering, Gold Coast Campus,**
**GRIFFITH UNIVERSITY QLD 4222**
**Ph: 07-55528590 / Fax: 07-55528065, Email: a.bala@griffith.edu.au**

## Introduction

**At the request of many City councils and Industries engaged in Pavement Works, a course on Pavement Engineering, Maintenance and Management is arranged at Griffith University from April 14-17. Jothi Ramanujam (Rama) from QDMR has kindly agreed to lead this Course. Rama as we call him is the Principal Engineer on Pavements at QDMR and has 35 years of experience with Pavement Engineering of which 19 years were at QDMR. He graduated from University of Sri Lanka and obtained his Post-graduate Degree with distinction at the University of Leeds. He is a Chartered Engineer and a Member of Engineers, Australia, ICE London. In addition to his excellent experience on Road works in Sri Lanka, Rama also worked on major Road and Highway Projects in Nigeria, Abu-Dhabi, UAE and the Kingdom of Brunei before joining QDMR. This and other major activities have exposed Rama to tropical, sub-tropical and Middle East Practice of Pavement Design and Engineering. At QDMR, as a Principal Engineer (attached to the Pavement Rehabilitation Unit, Pavements Materials and Geotechnical Division of the Roads System and Engineering), Rama has been active in the development of technical capability in districts and regions; Development and/or improvements to standards, specifications and code of practice; Management of risk through development of pavement risk profiles and Transfer of technology. Rama has planned, organised and carried out pavement investigation works on more than 500 projects, including performance studies of rehabilitation treatments such as fabric seals, pre-mix edge strips, crack control products, granular recycling and asphalt recycling. Also, through his research and development work, he has contributed to the Pavement Rehabilitation Manual, which won him the Main Roads Excellence Award.**

**We are also fortunate to have Prof. TF Fwa from the National University of Singapore. Dr. Fwa's research in the last 25 years covers all aspects of highway engineering, with special emphasis in the areas of pavement design, maintenance and management, and pavement performance evaluation and testing. He has published more than 200 technical papers in journals and conference proceedings, with more than 130 of them in leading international journals. His work has led to three patents in non-destructive pavement testing and evaluation. He is the editor of the recently published Handbook of Highway Engineering by CRC Press. Dr. T. F. Fwa is Professor in the Department of Civil Engineering and Director of the Centre for Transportation Research, National University of Singapore. He received his BEng (First Class Hons) from the then University of Singapore (now known as the National University of Singapore), MEng from the University of Waterloo, Canada, and PhD from Purdue University, USA.**

**A widely respected researcher, Dr Fwa has been invited to lecture and make technical presentations in 16 countries, including keynote lectures at a number of international conferences and symposia. He has received a number of awards for his academic and research contributions, including the 1985 Eldon J. Yoder Memorial Award by Purdue University, USA, the 1992 Katahira Award by the Road Engineering Association of Asia and Australasia, the 1992 Arthur M. Wellington Prize by the American Society of Civil Engineers, the 1995 Katahira Award by the Road Engineering Association of Asia and**

**Australasia, the 2000 Engineering Achievement Award by the Institution of Engineers, Singapore, the Enterprise Challenge (TEC) Award 2002, Singapore, and the Frank M. Masters Transportation Engineering Award 2005 by the American Society of Civil Engineers, USA. Professor Fwa serves the international community in various capacities. He is the Asia Region Editor for the ASCE Journal of Transportation Engineering. He also serves on the editorial board of three other international journals: the International Journal of Pavement Engineering, the International Journal of Road Materials and Pavement Design, and the International Journal of Pavements. He is currently Vice President of the International Society for Maintenance and Rehabilitation of Transport Infrastructure, Board Member of the Eastern Asia Society for Transportation Studies, and Special Advisor to the International Association of Traffic and Safety Sciences. Locally, he has been chairing the Transportation Engineering Technical Committee since 1993. He is the founding President of the Pavement Engineering Society (Singapore).**

**Joining Rama and TF (Prof. Fwa) is Dr. Kanitpong who has completed her doctoral studies in Civil Engineering specializing in Highway Materials and Engineering from the University of Wisconsin-Madison (USA) in 2004. She obtained her master's degree in Construction Management from the University of Maryland at College Park (USA) in 1999. She graduated from Chulalongkorn University (Thailand) where she garnered her bachelor's of science degree in Civil Engineering in 1997. Her areas of expertise revolve around the pavement analysis and design, highway materials and construction, asphalt rheology and failure testing, and asphalt concrete mixture design and analysis. She was trained in the asphalt area for many years and has experience in asphalt binder testing, mixture design, and field measurements. Prior to joining AIT, she served the University of Wisconsin-Madison as Research Associate for many years. Currently, she has been involved in pavement construction projects and many pavement materials research projects in Thailand.**

**The research focus of Kunnawee is in the area of highway pavements with emphasis on several major aspects including: (1) highway materials and construction, (2) pavement design and analysis, (3) asphalt rheology, and (4) asphalt binders and asphalt concrete mixtures. Characterization of highway materials and prediction of material behaviour play the important roles for the long-lasting pavement structures. The test methods are required to extract the important properties that are related to the pavement performance. Moisture damage has been identified as one of major problems that impact the pavement performance. Kunnawee is the author of many publications and also have carried out many projects for the Department of Highways in Thailand.**

**In addition to Rama, TF and Kunnawee we also have Dr. Walid Nasser who has a Ph.D. in Pavement Design with the focus of the development of mechanistic shift factors for fatigue transfer functions. He serves on the technical panel for the American Society of Civil Engineers Flexible Pavement Design committee and the Transportation Research board Flexible Pavement Design Committee. During his MSc he developed computer software for mechanistic-empirical design of asphalt overlays. The software is currently being used and sold by Idaho Department of Transportation. Through the course of his PhD studies he**

**manufactured, calibrated, installed and collected data from several pavement sensors. Data collected from strain gauges, pressure cells, thermocouples, and time domain reflectometers were used along with laboratory fatigue tests to develop correlations between field and laboratory environments.**

**After his PhD, Walid worked as an Assistant Professor in Bradley University in Illinois where he taught pavement design courses. During his tenure at Bradley he conducted several research projects related to the anisotropic behaviour of asphalt due to roller compaction and the identification of reclaimed asphalt pavements from cored samples. Walid's Doctoral studies was at the Virginia Polytechnique and State University (VPI&SU) which has a strong transportation program with Emeritus Prof. Don Drew who was at the Asian Institute of Technology in the late sixties and seventies developing the Transportation Engineering Program.**

**Last but not the least is Dr. Gary Chai with more than 20 years of experience in Pavement and Geotechnical Engineering design, highway construction and asset management, and R & D. Gary is also the leader of the collaborative research and development program between Griffith University, SMEC Australia and the six Local Government Authorities in Southeast Queensland; this study is primarily focussed in calibrating the pavement deterioration factors that are required by the HDM-III deterioration models that have been integrated within the SMEC PMS. The SMEC Pavement Management System is widely used by Local Government Authorities within Australia and is currently being used to manage over 20,000 km of road consisting of over 100,000 road sections. Gary will discuss the procedure for the selection of the Southeast Queensland long term pavement performance (SEQ LTPP) sites and the rationale behind the design of the LTPP site selection matrix. He will also examine the improvement of the newly calibrated HDM-III models when attempting to match the data from the SEQ LTPP sites; A case study to establish the impacts of the calibrated models on the network pavement condition and the annual pavement maintenance budget for Gold Coast City will also be included.**

**Gary's main areas of expertise include pavement design of high volume urban expressway and road rehabilitation where his strength lies in the fields of soil mechanics of pavement foundation and application of FWD testing for structural evaluation of pavement performance. He also has extensive knowledge and experience in using the mechanistic methodology for pavement capacity evaluation. Gary had also in several occasions in the 1990s collaborated with several international renowned pavement and geotechnical experts in solving some of the most complex and challenging pavement and geotechnical problems encountered in Malaysia. Gary has gained professional recognition at international level in highway pavement design and management. He frequently contributes to research seminars in Australia and speaks at national and international conferences in both Australia and the Asia Pacific Region. His pavement design experience began while working with the Department of Transportation in Kansas, USA and later in the Southeast Asia region, where he led a pavement design team in delivering major Design-Build-Operate-Transfer (DBOT) highway projects including Malaysia, the Philippines, Vietnam and China. Gary is currently a Senior Research Fellow at the Griffith School of**

**Engineering at the Gold Coast campus where he undertakes a local government funded road research project in collaboration with SMEC Consulting Engineer Pty Ltd and several Councils in the Southeast Queensland.**

# DAILY PROGRAMME

## Day 1 – Tuesday, 14th April

| | | | |
|---|---|---|---|
| **08:30** | **–** | **09:00am** | **Registration** |
| **09:00** | **–** | **10:00am** | **Concept of Total Highway Management & PMS (Prof. Fwa)** |
| **10:00** | **–** | **11:00am** | **Pavement Maintenance Management Systems (Prof. Fwa)** |
| **11:00** | **–** | **11:15am** | **Coffee break** |
| **11:15** | **–** | **12:15pm** | **Techniques of Pavement Condition Quantification (Prof. Fwa)** |
| **12:15** | **–** | **01:00pm** | **Lunch** |
| **01:00** | **–** | **02:15pm** | **Pavement Investigation, Maintenance and Rehabilitation Treatments (Jothi Ramanujam)** |
| **02:15** | **–** | **03:30pm** | **Pavement Condition Assessment (Jothi Ramanujam)** |
| **03:30** | **–** | **03:45pm** | **Coffee break** |
| **03:45** | **–** | **05:15pm** | **Pavement Structural Assessment (Jothi Ramanujam)** |

## Day 2 –Wednesday, 15th April

| | | | |
|---|---|---|---|
| **08:30** | **–** | **09:00am** | **Registration** |
| **09:00** | **–** | **10:00am** | **Structural Evaluation of Flexible & Rigid Pavements (Prof. Fwa)** |
| **10:00** | **–** | **11:00am** | **Optimal Programming for PMS (Prof. Fwa)** |
| **11:00** | **–** | **11:15am** | **Coffee break** |
| **11:15** | **–** | **12:15pm** | **Budget Planning and Allocation (Prof. Fwa)** |

| | | | |
|---|---|---|---|
| **12:15** | **–** | **01:00pm** | **Lunch** |
| **01:00** | **–** | **02:15pm** | **Foam Bitumen Stabilisation (Jothi Ramanujam)** |
| **02:15** | **–** | **03:30pm** | **Lime Stabilization of Pavement Materials (Jothi Ramanujam)** |
| **03:30** | **–** | **03:45pm** | **Coffee break** |
| **03:45** | **–** | **05:15pm** | **Hot Mix Asphalt Materials and Characteristics (Dr. Kunnawee)** |

## Day 3 –Thursday, 16th April

| | | | |
|---|---|---|---|
| **08:30** | **–** | **09:00am** | **Registration** |
| **09:00** | **–** | **10:00am** | **Design Factors for Flexible and Rigid Pavement Design (Dr. Kunnawee)** |
| **10:00** | **–** | **11:00am** | **AASHTO and AUSTROADS Pavement Design (Dr. Kunnawee)** |
| **11:00** | **–** | **11:15am** | **Coffee break** |
| **11:15** | **–** | **12:15pm** | **Mechanistic-Empirical Pavement Design of New and Rehabilitated Pavements (Dr. Kunnawee)** |
| **12:15** | **–** | **01:00pm** | **Lunch** |
| **01:00** | **–** | **02:15pm** | **Pavement Recycling (Dr. Kunnawee)** |
| **02:15** | **–** | **03:30pm** | **Airport Pavement Design (Dr. Kunnawee)** |
| **03:30** | **–** | **03:45pm** | **Coffee break** |
| **03:45** | **–** | **05:15pm** | **New Innovations on Pavement Construction Technology (Dr. Kunnawee)** |

## Day 4 --Friday, 17th April

| | | | |
|---|---|---|---|
| **08:30** | **–** | **09:00am** | **Registration** |
| **09:00** | **–** | **10:30am** | **Experiences with Development of Pavement Management Systems for SE Queensland (Dr Gary Chai)** |

| | | |
|---|---|---|
| **10:00 – 10:30am** | **Coffee break** |
| **10:30 – 11:30 pm** | **Airport Pavement Design Case Studies from Beirut and Queen Alia International Airports (Dr. Walid Nassar)** |
| **11:30 – 12:30pm** | **Pavement Design Methods and Standards- An international perspective (Dr. Walid Nassar)** |
| **12:30 – 1:00pm** | **Lunch** |
| **01:00 – 02:00 pm** | **Experiences of Pavement Design in Malaysia (Dr Gary Chai)** |
| **02:00 – 03:00pm** | **Effects of Soil Suction on Resilient Modulus and Pavement Design (Dr. Don Cameron)** |
| **03:30 – 03:45pm** | **Coffee break** |
| **03:45 – 04:45pm** | **Bleeding failure in Bituminous Pavements: Case histories from Central Queensland (Dr. Kali Nepal)** |
| **04:45 - 5:45 pm** | **Geosynthetics in Pavement Engineering Rod Fife, Geofabrics Australasia** |

## Registration Can Now Be Done Online

**Workshop & Lectures on Pavement Engineering, Maintenance and Management**

**ON LINE REGISTRATION AND PAYMENT:**
**HTTPS://WWW.CONFERENCEONLINE.COM/INDEX.CFM?PAGE=BOOKING&OBJECT=CONFERENCE&ID=13567&CATEGORYKEY=A2231E87%2D338F%2D4610%2DBA49%2D9C70E5BD6A54&CLEAR=1**

**(A) SIMPLY FOLLOW THE LINK; YOU WILL BE REQUIRED TO FILL IN YOUR DETAILS AS BELOW:**

**First Name:**
**Last Name:**
**Preferred First Name:**
**Organisation:**
**Contact phone:**
**Fax:**
**Contact email:**
**Address:**
**City/Suburb:**
**State/Country:**
**Postcode/Zipcode:**
**Country:**

***Please note that password is also required. You will use this password to log into the User Admin area and modify your registration if necessary.**

**(B) BY CLICKING "NEXT STEP", YOU WILL BE ABLE TO SELECT THE MODULE YOU INTEND TO ATTEND.**

- □ **AUD $ 490 - Tuesday, 14th April 2009**
- □ **AUD $ 490 - Wednesday, 15th April 2009**
- □ **AUD $ 490 - Thursday, 16th April 2009**
- □ **AUD $ 490 – Friday, 17th April 2009**

**By ticking the box, you are now registered for the days you selected.**

**(C) PLEASE CLICK "NEXT STEP" AGAIN, YOU WILL NOW ABLE TO SELECT THE PAYMENT METHOD YOU WANT TO USE. THESE INCLUDE:**

- □ **CREDIT CARD (VISA/ MASTERCARD/ AMEX)**
- □ **CHEQUE**
- □ **DIRECT DEPOSIT (EFT)**

**(D) AFTER YOU FILLED IN ALL THESE DETAILS, YOU ARE NOW REGISTERED IN THE WORKSHOP BY CLICKING THE "SUBMIT" BUTTON. AN INVOICE WILL BE SENT TO YOUR EMAIL DIRECTLY.**

***For additional information please contact (preferably by e-mail)**
**Prof. A. S. Balasubramaniam (Bala)**
**Griffith School of Engineering, Gold Coast Campus,**
**GRIFFITH UNIVERSITY QLD 4222**
**Ph: 07-55528590 / Fax: 07-55528065, Email: a.bala@griffith.edu.au**

# Bio-data of Speakers

## (1) Jothi Mohan Ramanujam (Rama) is the Principal Engineer Pavement Rehabilitation at the Queensland Department of Main Roads (QDMR). Rama as we call him has 32 years of experience with Pavement Engineering of which 16 years were at QDMR. He graduated from University of Sri Lanka and obtained his Post-graduate Degree with distinction at the University of Leeds. He is a Chartered Engineer and a Member of Engineers, Australia, ICE London.

**In addition to his excellent experience on Road works in Sri Lanka, Rama also worked on major Road and Highway Projects in Nigeria, Abu-Dhabi, UAE and the Kingdom of Brunei before joining QDMR. This and other major activities have exposed Rama to tropical, sub-tropical and Middle East Practice of Pavement Design and Engineering. At QDMR, as a Principal Engineer (attached to the Pavement Rehabilitation Unit, Pavements Materials and Geotechnical Division of the Roads System and Engineering), Rama has been active in the**

- **Development of technical capability in districts and regions**
- **Development and/or improvements to standards, specifications and code of practice**
- **Management of risk through development of pavement risk profiles and**
- **Transfer of technology**

**Rama has planned, organised and carried out pavement investigation works on more than 500 projects, including performance studies of rehabilitation treatments such as fabric seals, pre-mix edge strips, crack control products, granular recycling and asphalt recycling. Also, through his research and development work, he has contributed to the Pavement Rehabilitation Manual, which won him the Main Roads Excellence Award.**

**Other departmental documents to which he has made a significant contribution are:**

- **Technical Note 8 on the use of fabric for sealing works**
- **Technical Note 39 on lime treatment of clay subgrades**
- **Technical Note 44 on in -situ foamed bitumen stabilization of pavement materials**
- **Technical Notes 11 and 12 on hot in-place asphalt recycling**
- **Supplementary Specifications for in-situ recycling of granular pavements**
- **Guidelines for the application of geo-fabric seals on clay subgrade (work in progress).**
- **Nomograph for interpretation of Benkelman Beam deflection parameters**
- **SMOOTH BOWL software for eliminating noise problems in the data acquisition system during deflection testing**
- **Construction and performance report on dust suppressants.**
- **Workshop on the latest technique of lime injection for expansive soil subgrades**
- **Software for granular and asphalt overlay design.**

**Rama has also participated and presented papers in the International Conferences in many countries and also in most States within Australia.**

## (2) Prof. T.F.Fwa

**Dr. T. F. Fwa is Professor in the Department of Civil Engineering and Director of the Centre for Transportation Research, National University of Singapore. He received his BEng (First Class Hons) from the then University of Singapore (now known as the National University of Singapore), MEng from the University of Waterloo, Canada, and PhD from Purdue University, USA. Dr. Fwa's research in the last 25 years covers all aspects of highway engineering, with special emphasis in the areas of pavement design, maintenance and management, and pavement performance evaluation and testing. He has published more than 200 technical papers in journals and conference proceedings, with more than 130 of them in leading international**

**journals. His work has led to three patents in non-destructive pavement testing and evaluation. He is the editor of the recently published Handbook of Highway Engineering by CRC Press.**

**A widely respected researcher, Dr Fwa has been invited to lecture and make technical presentations in 16 countries, including keynote lectures at a number of international conferences and symposia. He has received a number of awards for his academic and research contributions, including the 1985 Eldon J. Yoder Memorial Award by Purdue University, USA, the 1992 Katahira Award by the Road Engineering Association of Asia and Australasia, the 1992 Arthur M. Wellington Prize by the American Society of Civil Engineers, the 1995 Katahira Award by the Road Engineering Association of Asia and Australasia, the 2000 Engineering Achievement Award by the Institution of Engineers, Singapore, the Enterprise Challenge (TEC) Award 2002, Singapore, and the Frank M. Masters Transportation Engineering Award 2005 by the American Society of Civil Engineers, USA.**

**Professor Fwa serves the international community in various capacities. He is the Asia Region Editor for the ASCE Journal of Transportation Engineering. He also serves on the editorial board of three other international journals: the International Journal of Pavement Engineering, the International Journal of Road Materials and Pavement Design, and the International Journal of Pavements. He is currently Vice President of the International Society for Maintenance and Rehabilitation of Transport Infrastructure, Board Member of the Eastern Asia Society for Transportation Studies, and Special Advisor to the International Association of Traffic and Safety Sciences. Locally, he has been chairing the Transportation Engineering Technical Committee since 1993. He is the founding President of the Pavement Engineering Society (Singapore).**

## (3) Dr. Kunnawee Kanitpong

**Dr. Kanitpong completed her doctoral studies in Civil Engineering specializing in Highway Materials and Engineering from the University of Wisconsin-Madison (USA) in 2004. She obtained her master's degree in Construction Management from the University of Maryland at College Park (USA) in 1999. She graduated from Chulalongkorn University (Thailand) where she garnered her bachelor's of science degree in Civil Engineering in 1997. Her areas of expertise revolve around the pavement analysis and design, highway materials and construction, asphalt rheology and failure testing, and asphalt concrete mixture design and analysis. She was trained in the asphalt area for many years and has experience in asphalt binder testing, mixture design, and field measurements. Prior to joining AIT, she served the University of Wisconsin-Madison as Research Associate for many years. Currently, she has been involved in pavement construction projects and many pavement materials research projects in Thailand.**

**The research focus of Kunnawee is in the area of highway pavements with emphasis on several major aspects including: (1) highway materials and construction, (2) pavement design and analysis, (3) asphalt rheology, and (4) asphalt binders and asphalt concrete mixtures. Characterization of highway materials and prediction of material behaviour play the important roles for the long-lasting pavement structures. The test methods are required to extract the important properties that are related to the pavement performance. Moisture damage has been identified as one of major problems that impact the pavement performance. Kunnawee is the author of many publications and also have carried out many projects for the Department of Highways in Thailand.**

## (4) Dr. Walid Nassar

**Dr. Nassar has a Ph.D. in Pavement Design with the focus of the development of mechanistic shift factors for fatigue transfer functions. He serves on the technical panel for the American Society of Civil Engineers Flexible Pavement Design committee and the Transportation Research board Flexible Pavement Design Committee. During his MSc he developed computer software for mechanistic-empirical design of asphalt overlays. The software is currently being used and sold by Idaho Department of Transportation. Through the course of his PhD studies he manufactured, calibrated, installed and collected data from several pavement sensors. Data collected from strain gauges, pressure cells, thermocouples, and time domain reflectometers were used along with**

**laboratory fatigue tests to develop correlations between field and laboratory environments.**

**After his PhD, Walid worked as an Assistant Professor in Bradley University in Illinois where he taught pavement design courses. During his tenure at Bradley he conducted several research projects related to the anisotropic behaviour of asphalt due to roller compaction and the identification of reclaimed asphalt pavements from cored samples. Walid then started working with Dar Al-Handassah where he designed highway pavements in Africa, Russia and the Middle East. He also designed new runway and taxiway pavements for airports in Egypt, Dubai, Yemen, and Kuwait. He also designed rehabilitation treatments for airports in Lebanon and Qatar. He then moved to Dubai to work with Parsons, where he took the role of the Pavement Specialist for the Middle East region. He also served as the project manager for Dubai Health Care City project which involved infrastructure and master planning design and construction activities.**

**Walid has published several pavement related research papers and reports from both his work in academia and in practice.**

## (5) Dr. Gary Chai

**Dr Gary W. Chai has more than 20 years of experience in Pavement and Geotechnical Engineering design, highway construction and asset management, and R & D. Gary's main areas of expertise include pavement design of high volume urban expressway and road rehabilitation where his strength lies in the fields of soil mechanics of pavement foundation and application of FWD testing for structural evaluation of pavement performance. He also has extensive knowledge and experience in using the mechanistic methodology for pavement capacity evaluation. Gary had also in several occasions in the 1990s collaborated with several international renowned pavement and geotechnical experts in solving some of the most complex and challenging pavement and geotechnical problems encountered in Malaysia.**

**Gary has gained professional recognition at international level in highway pavement design and management. He frequently contributes to research seminars in Australia and speaks at national and international conferences in both Australia and the Asia Pacific Region. His pavement design experience began while working with the Department of Transportation in Kansas, USA and later in the Southeast Asia region, where he led a pavement design team in delivering major Design-Build-Operate-Transfer (DBOT) highway projects including Malaysia, the Philippines, Vietnam and China. Gary is currently a Senior Research Fellow at the Griffith School of Engineering at the Gold Coast campus where he undertakes a local government funded road research project in collaboration with SMEC Consulting Engineer Pty Ltd and several Councils in the Southeast Queensland. The research models the impacts of traffic volumes, pavement thickness and age, and environmental influence on pavement deterioration rate in Southeast Queensland. The study is carried out using SMEC Pavement Management System with HDM-III model.**

## (6) Dr. Kali Prasad Nepal

**Dr Nepal completed his doctoral studies in Transport planning from Tokyo Institute of Technology in 2005. He obtained his master's degree in Civil Engineering in Asian Institute of Technology (AIT), Bangkok, Thailand in 2002. He obtained his first degree at Institute of Engineering (IOE), Tribhuvan University in Nepal. Dr Nepal has extensive international research experiences in transportation planning and modelling, transportation engineering and pavement engineering in Nepal, Thailand, Japan and Australia. His areas of expertise include activity-based travel behaviour modelling, pavement design, failure analysis of bituminous pavements, pavement materials characterization, and pavement marking retroreflectivity among others. In this workshop, he will be sharing his findings of "Bleeding Failure in Sprayed Bitumen Reseals" using real observations at Emerald Central District, in Central Queensland.**

## (7) Dr. Don Cameron

**Dr. Don Cameron now in University of South Australia had all his engineering education in University of Sydney. His research interest are in Pavement evaluation by repetitive loading ; Dependence of the cyclic stiffness of cohesive subgrades on soil suction, density and total stress state; Evaluating the potential movement due to trees of various species, planted in expansive soils in a semi-arid climate ; Identification of collapsing soils, predicting the influence of such soils on buildings and reducing the collapse potential with in-situ treatments ; Improving rail subgrade on wet clay sites by restoring vegetation in the rail corridor ; Evaluation of recycled and modified materials for construction purposes and Flexible pipes buried in granular backfill . Prior to joining University of South Australia Don was at CSIRO Melbourne for about eleven years. At the University of South Australia Don is active in 3D numerical modelling of the soil-structure interaction between expansive soils and shallow footings; soil suction and the resilient modulus of pavement subgrades ; piles in expansive soils ; the influence of street trees on urban infrastructure ; the design of dug outs in soft rock in an arid zone ; slope stability in glacial landforms ; innovative footing systems for low-rise buildings to mitigate potential earthquake damage and the feasibility of using native vegetation to improve rail track formation stability on poorly drained clay sites. He is also the author of numerous publications.**