Managing Roads and Bridges – sponsored by ARRB
Current as at 26 Jan – subject to change

Session 1:
Managing risks on the road network – New Zealand and Australia leading innovation in managing risks for road users.
Presenters: Rita Excell and Brett Gliddon

The identification and management of risk is one of the key functions for all professionals involved in Public Works. There is no doubt that there is a role for national and international organisations and associations such as IPWEA, Austroads and PIARC to collate and disseminate information on world’s best practice strategies, tools and case studies to manage risk.

This paper discusses how the innovative approach to managing risk on the road network in Australia and New Zealand is influencing world’s best practice in risk management.

Brett Gliddon is a member of the PIARC Technical Committee TC1.5 Risk Management and in this capacity he is sharing NZ Transport Agency’s approach to managing risks, to develop a tool box of risk management techniques that will be incorporated into a web based Risk Management Manual.

Rita Excell is the Technical Leader for the development of the Australian National Risk Assessment Model (ANRAM). This research being undertaken by ARRB Group on behalf of Austroads builds on existing risk based road assessment programs such as AusRAP, KiwiRAP and iRAP. The paper will demonstrate how ANRAM is being used to inform the evolution of risk based assessment models and how road agencies are using the risk models derived from ANRAM to guide policy development and investment decision in Australia and New Zealand.

Probe data and its application in traffic studies
Presenter: Ian Espada

Probes are devices which are either carried by travellers or vehicles, and which are able to relay their location and any available additional data in real-time at very frequent refresh rates. These devices include smartphones and in-vehicle telematics. Since 2012, the growth in smartphones has sparked a phenomenal growth in the volume of probe data points. Probe data points grew at more than 100% p.a. from 2009 to 2013. Probe data is an emerging source of information on transport demand patterns and performance of the transport network. This paper will describe a number of use cases of probe data including applications in origin-destination analysis, before-and-after analysis, congestion hotspot identification, and access time analysis.

Dr Ian Espada holds degrees in traffic engineering and transport planning from the University of Tokyo (PhD) and Asian Institute of Technology (MSCE), as well as in civil engineering from Central Philippine University (BSCE). From 2001 to 2008, he worked as a transport planner for ALMEC Corporation. Dr Espada joined the Network Operations team of ARRB Group in 2008. He is currently the Team Leader of this team at ARRB. He is also a lecturer on transport demand modeling at Swinburne University.

Implementing new road technologies: the tipes certification process
Presenter: Peter Damen

The road construction industry is often slow to embrace change due to an apprehension of the risks associated with innovation and a lack of information about appropriate implementation strategies. Before we embark on a construction project we are faced with the task of choosing from a wide variety of construction products that are available. Innovative, and what could be more efficient products, are often overlooked for more established methods and processes. As our society changes there is a clear need for innovation and therefore a need for any technical support that can be provided to our practitioners at both state and local government levels.
This paper illustrates the role of technical assessment (also known as Agrément) organisations in the international construction market, and how the technical assessment and certification process can influence users to adopt innovative products that contribute to sustainability in construction.

The paper covers the role that schemes such as TIPES play in the introduction of innovative construction products within the Australian road sector, by providing assurance to practitioners, and thus encouraging new products and building systems. TIPES purpose is to support and promote well-tested technologies to improve the efficiency of road construction in investment and operations, and therefore creating consistency, reliability, safety and reduced expenditures.

The paper illustrates the significant benefit that the TIPES certification process offers for local government roads engineers and practitioners by taking away uncertainty and facilitating the introduction, application and utilisation of satisfactory innovation and technology development.

Peter Damen is General Manager of Research and Consulting at ARRB Group and is responsible for delivering all of the Australian and International research and consulting activities of the company including the Austroads National Technical Research Program and the Queensland Transport & Main Roads Strategic Research Program. For many years Peter has been involved in transport planning, traffic engineering, road safety and asset management work undertaken throughout Australia and overseas. Prior to joining ARRB Group he worked for local government, a university and several consulting engineering firms where he was involved in a variety of projects undertaken for both the private and public sectors.

Session 2:

New innovations in pavement condition management in New Zealand using strength information from traffic speed deflector data
Presenters: Richard Wix & Dave Whitehead

For a road agency to successfully manage its road network it needs to know its condition. Therefore the NZ Transport Agency implements a data collection program to annually assess the surface condition of its state highway network using automated measuring techniques. However, a more complete picture of the network’s condition can be had by making an assessment of the functional performance of the pavement. This has traditionally been done using static or very slow moving testing equipment and has been restricted to project level assessments. However, the introduction of the traffic speed deflectometer (TSD) will allow NZ Transport Agency to assess the bearing capacity of the entire state highway network. The integration of complementary pavement data collections systems to measure surface characteristics such as roughness, rutting and texture along with newer technologies capable of automatic crack measurement will give the NZ Transport Agency the opportunity to gain a comprehensive assessment of the road networks condition. This paper describes the TSD technology and the integration of the additional pavement condition data collection systems, the bench marking of the device in New Zealand and how NZ Transport Agency intends to use the data collected by the TSD to manage its state highway network.

Richard completed a Bachelor of Engineering (Chemical) at Monash University in 1985, and joined ARRB in 1990. He presently holds the position of Technical Specialist in the Systems Division where he focuses on the measurement of pavement surface characteristics and the implementation of new pavement data collection systems like the traffic speed Deflectometer (TSD). Richard’s activities with ARRB have included the management of large-scale network-level pavement condition surveys, both locally and internationally, and the development and verification of ARRB’s data collection equipment.

Dave has over 30 years of experience in a variety of roles within the highways engineering sector and is the Senior Pavements Engineer within the Pavement Group at the NZ Transport Agency’s National Office in Wellington. Dave has been part of the team responsible for developing the T10 specification relating to skid resistance as well as currently managing the national contracts for collection of high speed pavement condition data, including traffic speed deflectometer.
Skid resistance management – striving for that optimum local strategy
Presenters: Paul Hillier and John Donbavand

This collaborative paper between NZTA and ARRB group will first examine the many benefits that can be accrued from the management of skid resistance within the contemporary contexts of both the Safe System approach to road safety and ‘having to do more with less’ on an ever increasing road network which is deteriorating rapidly. Key considerations in skid resistance management tend to revolve around how little or how much of the network should receive routine (proactive) consideration when viewed from a risk management perspective and where testing is ultimately favoured, how the data is collected and analysed (often alongside other data sets) to maximum effect. In practice this requires a number of challenges to be worked through – not least how a suite of skid resistance investigatory levels can be established that is consistent with existing and forecast future road usage and how site treatments are prioritised in order to suit varying budgets. In recent years, the majority of state road agencies in both Australia and New Zealand have evaluated and refined their existing approaches to skid resistance management and this paper will highlight some of the main changes made and why”

Paul is one of ARRB’s National Technical Leaders and a Principal Consultant in its Safe System group. He has 25 years’ experience in the management and maintenance of private and public road networks, in particular road surface characteristics as they affect road safety outcomes. He advises road agencies on risk and liability issues at both strategic and policy / activity specific levels. He has experience working in a number of countries in both the developed and rapidly developing world, most recently in rural China and Vietnam.

John is currently the National Pavements Manager for NZTA. In this role his principal responsibility is to maintain and develop the standards, specifications and guidelines for State highway pavements. John also takes a leading role in training and pavement related research.

Spray sealing of low volume road networks: recent Trans- Tasman developments and learning
Presenters: Paul Hillier and David Darwin

This joint paper between NZTA and ARRB group will examine recent developments in the specification, programming and practical undertaking of spray (chip) sealing on low volume road networks in Australia and New Zealand.

In 2005, Austroads estimated that there were some 390,000km of sealed roads in Australia and New Zealand, of which approximately 87% were spray (chip) sealed, a considerable and highly significant network to manage and maintain, often carrying a low volume of traffic, yet being critical to the everyday life of local communities. This paper will look at recent challenges, developments and innovative practices in keeping such roads open and passable, often with less, drawing on material from recent local and Austroads research and field trials, the ARRB/TMR low volume road symposium held in Cairns in late 2013 and the recent 26th ARRB Conference in Sydney.

Session 3
Bridge rehabilitation and maintenance – pushing the boundaries
Presenter: Rudolph Kotze and Barry Wight

Bridges form critical links in the performance of road networks and the ability to provide acceptable levels of service relies on effective asset management. Asset owners must be aware of and understand the risks involved in managing their assets. Local Government in particular, face increasing pressure to reduce funding for bridge management and maintenance. This comes in the face of government initiatives to increase national productivity through increasing frequency and weight of heavy vehicles. Asset owners are increasingly adopting risk-based decision-making principles in managing ageing infrastructure. However, such an approach must be must be supported by accurate and meaningful asset information, captured in a systematic and consistent manner. Often Local Government organisations have to contend with a lack of structural engineering resources as well as basic design and as-built
information. Despite these issues, asset managers are responsible for ensuring that bridges and culverts are maintained to safely provide for increasing vehicle loads. This paper describes effective risk-based bridge asset management, with reference to best-practice systematic asset management principles applicable for state and Local Government. It focuses on current New Zealand (NZTA) and Australian practice and outlines key elements in ensuring consistency in data capture, management systems and the use of this information to effectively manage bridge and other structures assets. The paper also discusses important risk areas associated with bridges and their identification and mitigation to ensure limited resources are directed to maintenance and strengthening activities that will maximize the investment return for the asset owner. The paper provides examples and case studies of how basic engineering principles and judgement can be used in situations where limited data is available, to make decisions regarding maintenance and network access.

Rudolph has 30 years’ experience in road and rail bridge design, bridge asset management, maintenance and project delivery. This includes 15 years in senior leadership and management roles in consulting practices in South Africa and New Zealand. After moving to New Zealand in 1996, he held the positions of Technical Manager of the NZ Cement and Concrete Association, Technical Manager Bridges with Holmes Consulting and National Structures Manager of the New Zealand Transport Agency (NZTA) with responsibility for asset management, maintenance and design standards. He is currently National Technical Leader, Bridges and Structures with ARRB Group based in Brisbane.

Barry is the National Structures Manager for the New Zealand Transport Agency responsible for over 4000 bridges on the state highway network including major structures such as the Auckland Harbour Bridge. Barry has over 30 years’ experience in asset management and structures engineering. Key roles have included Group Leader of the Opus National Bridge Design Team and MWH asset management leader for the Wellington state highway network. Barry was the Team leader for a project to develop the first asset management plan for NZ state highway bridges in 1998. He has recently been involved in an internal NZTA review of asset management practices generally. He is now in the process of refining NZTA structures asset management practices and in particular, developing pragmatic optimum life cycle management planning processes.

Emerging challenges for road network managers – road network access
Presenter: Damien Hense

Abstract to come

Through the eye of a worker bee - encouraging young professionals to build and share knowledge
Presenter: Kim Sedgwick

There are three types of bees in a hive: a queen, drone and worker bee. Every bee has the one common goal; every bee works as a team and all bees teach each other the tricks of the trade. There is only one leader, the Queen Bee. If we adapt this knowledge and share in the bee’s wisdom, perhaps we can learn that withholding knowledge does not equate to power; nor does it make us in disposable. How much more can we achieve if we share and build on the knowledge of our young professionals?

Honey Bees are called social animals because they live in colonies and rely on each other – much like the way many teams are setup in our daily lives. Without the experienced professionals, the young professionals cannot grow; and without young professionals, there is no one to take on the tasks when required. What will it take for all the worker bees in any one organisation work together, for the greater benefit of the hive?

Kim Sedgwick is the Operations Manager for Systems Division of ARRB Group. In 2014, Kim was renominated as the Chair, Young IPWEA and is also a member of the IPWEA Victoria Board. Kim’s focus with Young IPWEA is to promote the industry to young professionals, as well as being an advocate for young professionals in the industry.