Speaker overview

Workshop MC – Jim Hopkins

Thursday 14 September and Friday 15 September

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<th>Opening Keynote – David Jones</th>
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<td>Unpaved Road Chemical Treatments: Where are we After 110 Years of Use?</td>
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<td>Key points:</td>
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<td>1. History of the use of chemical treatments on unpaved roads</td>
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<td>2. Understanding the role and potential benefits of chemical treatments in unpaved road management programs</td>
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<td>3. How the chemical treatment sector compares with other road industry sectors</td>
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<td>4. Initiatives to address some of the problems identified</td>
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<td>5. Way forward</td>
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David is Associate Director, University of California Pavement Research Centre University of California – Davis, Chair of Transportation Research Board Committee on Low Volume Roads (AFB30)

Scope: This committee is concerned with all aspects of low-volume roads including planning, design, construction, safety, maintenance, operations, environmental and social issues.

One part of David’s research in low volume roads has involved the use of chemical treatments for fines preservation as part of unpaved road management programs as a means of improving all-weather passability and extending the periods between routine maintenance interventions and between regravelling exercises. David will share his considerable knowledge on this topic and many others at our workshop.

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<th>High Speed Pavement Moisture Measurement Trials – Greg Arnold, Road Science</th>
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<td>High moisture within the pavement accelerates pavement deterioration, and ensuring the water is kept out of these pavement layers will increase life and save in maintenance costs. A high-speed moisture survey technique used overseas, which utilises ground penetrating radar combined with video and laser LIDAR was used on a range of roads in the lower North Island. A unique Moisture Damage Index was developed for use in New Zealand to enable the identification of high moisture levels at three different depths (top; middle; bottom) in 2m increments along the road using results from the ground and air coupled radar. In the free viewer software the road cross section can also be displayed to determine the rut depth, ditch depths, cross fall and high lip, which aid in determining the most appropriate improvement in drainage. The New Zealand trial of the moisture detection equipment showed higher rutting in road sections with high moisture while low moisture was detected in areas of nil of low rutting. Ten test pits measuring moisture at top, middle and bottom depths showed the moisture detection survey conducted seven months earlier was correct in the assessment of high and low moisture for 80% of the time.</td>
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Greg is a member of the technical team with Road Science. He graduated with a Doctor of Civil of Engineering at the University of Nottingham in 2004. His thesis topic investigated the rutting behaviour of granular materials. Prior to joining Road Science, Greg worked for NZTA as their Engineering Policy Manager and was the director of Pavespec Ltd undertaking pavement research and Repeated Load Triaxial testing.

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<th>Young Presenters session</th>
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<td>Roading from an Aerial Perspective – James McCallum, Southland District Council</td>
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<td>Over the past two years the Southland District Council have taken an innovative approach to assessing environmental and service demands of its expansive roading network, by the use of drone technology. With a vast network of over 5,000km of roadway and reduced funding within the Southland District, we need to work smarter by making use of such technology, essentially doing more with less. Drone technology provides high definition imagery that has been used across our district, and to date has been used for a vast range of purposes. The most common uses to date are; aerial mapping and surveying, bridge inspections, assessing coastal erosion, crash investigation reviews and weather events such as flooding and complex slip repairs. The presentation will cover firsthand experiences whilst using this exciting new technology from an engineering perspective. The presentation will outline the key findings for many of the drones’ common uses, such as aerial survey of large construction sites and quarries, as well as 3D modelling and processing options where savings for effort, time and expense have been made.</td>
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James started his engineering career in a cadetship role within Local Government in 2006, completing
meet those challenges is then outlined. National Land Transport Plan. DOC’s unique road network is illustrated. The challenges of managing an unsealed roads in poor condition. DOC is working with NZ Transport Authority to complete its first roads activity management improvement project. An inventory and inspection of its roads in 2016 found that many country. These roads provide access to some of New Zealand’s top places for tourism and to the key

The Department of Conservation (DOC) manages one of the longest networks of unsealed roads in the country. These roads provide access to some of New Zealand’s top places for tourism and to the key places where New Zealanders recreate in the outdoors. DOC is into the second year of a road management improvement project. An inventory and inspection of its roads in 2016 found that many are in poor condition. DOC is working with NZ Transport Authority to complete its first roads activity management plan and aims to secure funding for road maintenance from NZTA for the 2018-2021 National Land Transport Plan. DOC’s unique road network is illustrated. The challenges of managing an extensive remote and fragmented road network are described. The work that is being carried out to meet those challenges is then outlined.
Brian is a senior technical advisor in DOC’s national office and is leading DOC’s road management improvement project. He has been with DOC for 30 years, developing systems and standards in recreation, tourism and asset management. He has a particular interest in huts, campsites and tracks, and now roads.

Kaikoura Earthquake session x 4 presenters

Kaikoura EQC – Inland Road – Phil Collins
Information to come

A pavement engineer’s perspective of the impacts of sudden change in traffic loading on low volume roads – Martin Gribble, NZTA
The earthquakes that closed State Highway One through Kaikoura meant that there was a sudden and significant change in traffic for the Lewis Pass inland route. The inland route incorporates parts of State Highways 63, 6, 65 and 7. These sections of highway were typically constructed for low traffic volumes and State Highway 63 in particular had an estimated initial 13 fold increase in the daily heavy traffic. The pavement structure, which was suitable for its normal loading, was, in many places, suddenly inadequate for the traffic load. In places the pavement and surfacing deterioration was rapid and required repairs to be performed rapidly for safety reasons, these repairs were often failing rapidly also. The high traffic demand for the route meant that the pavement strengthening design had to be robust and easily built while minimising traffic disruptions. The response of the pavement to the increased loading and the lessons learnt from the necessary pavement strengthening program are discussed.

Martin is a Principal Pavement Engineer with the New Zealand Transport Agency. Some of Martin’s areas of involvement are with the Network Outcome Contract pavement rehabilitations, some Capital Works pavement designs and with the Long Term Pavement Performance program.

Making emergency detour roads safe - Richard Rea, RoadChem
Information to come

Local authority person

Auckland Transport Rodney dust suppression trial – Steve Browning, Downer
Information to come

Safer Journeys and the Safe System approach: Applicability to Low Volume Roads – Colin Brodie, NZTA
New Zealand’s road safety strategy, Safer Journeys, and the Safe System approach has been around for over seven years now. We have heard about the need for forgiving roads and roadsides, safer speeds and safer vehicles. We have seen a greater roll out of wire rope barriers on high volume, high risk highways. However, how does this all relate to developing countries or low volume roads in New Zealand where money is a scarce commodity?

Colin is a Chief Advisor: Safety for the New Zealand Transport Agency. He has over 40 years’ experience in road design, traffic engineering and road safety. Colin has been a member of the Austroads Safety Task Force for over 10 years, helping guide the implementation of the Safe System, and was also a member of the OECD/ITF working group for the publication of the Zero Road Deaths & Serious Injuries research report in 2016.

The possibility of lower quality basecourse on much of the public road network – David Hutchison, Downer
Careful stewardship of expenditure State highway maintenance operations is at the heart of NZTA’s Network Outcome Contracts (NOCs). Minimising long term maintenance costs on respective treatment lengths of the public road network is consistent with this objective. NZTA acknowledges that factors (e.g. terrain and subsoil) do not mean that same long term costs are achieved for all sections with similar traffic demand, but the ONRC (One Network Road Classification) policy will require comparison and discussion about differences. A key contributor to maintenance costs is the rehabilitation operation. This presentation focusses on balancing the loading demand (number of Equivalent Standard Axles (ESA)) over the design life of the pavement with costs of alternative basecourse aggregates available for a treatment length and
achievable design life, in order to minimise ongoing annual cost of the rehabilitation operation. Most of the public road network has modest traffic (75% of the SH network carries less than 6,000 vehicles per day\(^1\), and this proportion is much greater for the much longer, non-SH component). In the study, we assume that the basecourse is either overlaid or inlaid with new material. Using the Aggregates Quarry Association’s (AQA’s) materials source and cartage rates, basecourse quality options as reflected in weathering potential (Clay Index) and Repeated Load Triaxial (RLT) testing, we compare long term annual rehabilitation costs for a range of One Network road classes. The results are partly based on postulate. However, as well as indicating benefit, they point to the need for further research of local aggregates, including field trials of locally available marginal basecourses on low volume roads.

**Kalapara District Council unsealed network research project — Aidan Ford, Broadspectrum NZ and Bernard Peterson, Kaipara District Council**

The Kaipara District Council (KDC) consists of 1,575 km of mainly rural road network of which 72% is unsealed. **The Problem:** The Current material specifications that exist exhibit un-favourable characteristics on the unsealed network. As a result a high level of intervention is required to resolve these issues. There is no clear satisfactory objective method for measuring the levels of service on an unsealed road. This results in the contractor reactively responding to customer requests. Pressure is mounting on the expected levels of service (LOS) on unsealed roads. With the introduction of the one network road classification (ONRC) across local authorities, there is an expectation for far greater alignment between local authorities. **The Aims of this research project are:**

- To utilise the use of blended aggregates with a plasticity Index deemed conducive to sustained binding of pavements optimizing maintenance costs limiting intervention.
- To establish a structured proactive approach to management of the unsealed network.
- Utilise technology to establish an objective approach to measure the LOS, in conjunction with the ONRC expectations.

Aidan is Broadspectrum’s Contracts Manager / National RAMM Manager based in the Kaipara District. Over the last 10 years in the roading construction industry Aidan has worked with several clients to set up new systems and implement smarter planning and programming for optimised decision making. In his role as National RAMM Manger he has been at the forefront of implementing systems for clients across all BRS businesses in New Zealand including development of MMP’s for NZTA NOC Contracts. Batchelor of applied Management. Diploma of engineering Civil.

Bernard works for the Kaipara District Council as the Roading Maintenance Engineer. Bernard has been with the Kaipara District Council since the Roading services were brought in house in concurrence with the establishment of the shared business unit, the Northland Transportation Alliance. Bernard has more than 12 years’ experience in roading having previously worked for Broadspectrum in Contract and Project Management.

**Stretching the budget – Doug Carrasco and Todd Mylcreest, Waikato District Alliance**

Balancing financial constraints with community outcomes – the unsealed challenge

The Waikato District network comprises of 600km of unsealed roads which attributes for 25% of the network. The requests for service/issues raised are significantly disproportionate to the size of the unsealed road network. These issues account for more 40% of the customer issues. Pressures on the maintenance budgets - more so in the unsealed network- coupled with the discontinuous nature of the network makes this every maintenance manager’s nightmare. This district also has diverse ground conditions, ranging from slip prone ‘papa’ substrates to peat swamps. Aggregate sources are not often within easy reach and pose logistical challenges.

The Waikato District Alliance (WDA) was formed in July 2017 and inherited a vastly neglected unsealed road network. The challenge presented to the team was to bring the network to a safe standard (some parts of the network were so unsafe that the local school bus drivers refused to travel on them) and reinstate confidence in the community. Customers living on gravel roads often challenge the value that they receive for relatively high rates that they pay.

WDA employed key strategies to deliver on these outcomes

- Engagement with the community and affected parties (school bus operators/Drivers)
- Identification of suitable gravels, blends and additives
- Development of an unsealed strategy

After nearly 18months the network has begun to see the impact and effect of the strategies employed. Unsealed LoS compliance has steadily started to improve. Customer confidence is beginning to improve.
Doug has worked in the transportation and civil engineering sector in NZ over 16 years. He has a strong background in materials, pavement design, construction and network management. He was the contract manager for the NZTA west Waikato Hybrid and more recently has been involved in the formation and delivery of the Infrastructure alliance (Downer and Hamilton City council) and Waikato District Alliance (Downer and Waikato District council). Through his career he has provided technical guidance around asset management, pavement design and construction practices. Working in partnerships with local authorities has given Doug a wide view on risk management having to balance affordability with levels of service. Doug also performs the role of Area manager for the Waikato –Bay of Plenty for Downer NZ.

Todd is currently the maintenance manager on the Waikato District Alliance (WDA). His responsibilities are centred around delivering the maintenance outcomes form a technical and customer perspective for a network that totals 2400km. and With 14 years’ experience in roading maintenance and civil construction, Todd has a sound understanding and knowledge of maintaining rural networks. He has worked on a variety of projects in the roading maintenance sector, including area wide pavement treatments, pavement widening, drainage works, footpaths and minor safety projects. He worked with various councils to refine and enhance their maintenance intervention strategy. He drew on his years of road maintenance expertise to develop a strategy that clearly defined the parameters for intervention for both the contractor and the Council.

Dust free, or are we? Johnny Brown, HEB
The Selwyn District’s 1,116 kilometres of unsealed roading network generate a large number of challenges. Through following a stringent grading schedule, and by having three full time maintenance graders on the network, HEB have managed to get on top of the majority of the usual unsealed roading challenges such as potholes and corrugations. However, dust caused by vehicles movements on our unsealed roads is still a very emotive and political issue.
Kerrs Road in Rolleston is a ‘hot spot’ for Customer Service Request (CSR) complaints. It is a flat, straight, homogenous section of unsealed road spanning 1.6km. It currently receives grading once every three weeks and has 106 ADT, with 6% HCVs.
Kerrs Road will be divided into 6 clearly defined sections, each of 260 metres in length, the first 5 sections will be treated with carefully selected topically applied dust suppression products. The 6th section will remain untreated.
During the trial we will using the following methods to measure and quantify the success of the various products; Dust Deposition Gauges, vehicle drive over surveys, RoadRoid, Clegg Hammer and customer feedback/engagement surveys.
Challenges created by the production of dust requires addressing. This trial, which is due to start in January 2017, will give us greater insight in to how best to minimise and mitigate these challenges; in such a way that is cost effective, environmentally friendly and fit for purpose.

Johnny is a 35 year old kiwi who recently returned home to NZ, having lived the last 11 years in Australia. Johnny has 13 year’s civil engineering and construction industry experience. Over this time he has had the unique experience of studying for his industry qualifications whilst working through the ranks.

Pulling numbers out of your AARs - Murray Gimblett, NZ Transport Agency
Road controlling authorities provide data about their activities through their Annual Achievement Returns.
This presentation will outline analysis of that data including an overview of cost drivers … and provide a one page summary that organisations can use to compare their cost to others.

Murray trained as a civil engineer. He has reshaped the road maintenance operations of local authorities and undertaken value for money studies for the Office of the Auditor-General. Over 15 years he also worked in the core public service in various roles including evaluating the performance of departments and chief executives.
For the last three years Murray has worked for the New Zealand Transport Agency advising on road maintenance spending. In this presentation he will share the results of his analysis of funding and Annual Achievement Returns with the goal of providing a useful guide for those who need to plan and manage low volume roads.

Jamie McPherson, Tasman District Council
Procurement of road maintenance activities is where the rubber meets the road in terms of giving effect to activity management plans. This is recognized in the draft NZ Transport Agency Investment Assessment Framework for road maintenance programmes, which will require all road controlling authorities to show evidence of smart procurement practices in their road maintenance programme business case to give confidence in the effectiveness of the activity delivery.
The Road Efficiency Group presentation outlines how REG has responded to the recommendations of
the Road Maintenance Task Force by developing a toolbox which provides the sector with tools and information to support smart procurement practice, and ultimately help meet our customers and investors expectations of efficiency and value for money. The Presentation provides guidance on the development of the toolbox and how it will assist procurement decision making.

Development of inspections for ONRC using pocket – Lee Hautler, HEB and Ben Wong, Selwyn District Council

With ONRC and performance measure requirements a number of the technical outputs called for field collection. Working together with Selwyn DC, Timaru DC and RAMM Software limited (RSL) this presentation will take you through the development and implementation of the enhancements to Pocket RAMM. To us, it made sense to develop our existing business tools in maintenance to cater for this, in doing so this ONRC inspection enhancement has also resulted in ‘Inspections for Assets”, with the ability to customise or build inspections for anything.

The presentation will explain how it works and how it is practically utilised in the field. Our input into this development was to test and feedback workflow and its usability and the information collected. Any improvements to tools should enhance and not hinder what we currently do by increasing efficiency for our inspectors.

Lee, Maintenance Technology Manager.  Lee has close to 20 years’ experience in the New Zealand Civil industry with the latter 10 managing maintenance contracts in the Canterbury region. Lee is HEB Constructions lead in Maintenance Technology. Specifically applying technology to enhance efficiency, accuracy and communication in the field and with stakeholders.

Ben is the Transportation Asset Planner at Selwyn District Council. His responsibilities include updating Council’s Activity Management Plan and providing transportation feedback for Resource Consents. Ben is interested in how new technologies can be leveraged to create better outcomes for the customer.

Quantifying and managing the effect of Dust discharged from unsealed roads – Jeff Bluett, Golder Associates

A two month road dust monitoring campaign was undertaken on a section of Mataraua Road, 10km southwest of Kaikohe in the Far North District, February to April 2015. The project’s key objectives were:
- Characterise the dust and quantify the impacts of dust from unsealed roads on people
- Determine the effectiveness and cost of dust mitigation measures
- Estimate the costs of the health impacts of dust and estimate the benefits of mitigating the dust
- Propose a methodology to support decision making about mitigation options

The monitoring results indicated that potential adverse human health impacts might occur due to the dust discharged from untreated unsealed roads. A comparison of the PM$_{10}$ concentrations monitored at the untreated and treated sites showed that the application of a dust suppressant significantly reduced the impact of dust discharged from the road.

This paper will present a summary of the key findings from the project and highlight some recent developments around dust management at a local and national level. The paper will cover:
- The current state of our knowledge on the effects of dust
- The management of road dust by a TLA (Marlborough case study)
- New Zealand Transport Agency policy position

Jeff has over 18 years of experience as an air quality scientist and consultant and has numerous publications on transport, industrial, domestic and agricultural emissions to air. Jeff has been involved in research, consultancy and advice to local and central government and to industry. Jeff’s most recent investigations have focused on qualifying the effects of dust and the efficacy of various dust suppressants from roadways, bulk material stockyards and open cast coal mines.

Malvern Hills small bridge replacement – Mark Chamberlain, Selwyn District Council

In the Waianiwaniwa Valley of the Malvern Hills Selwyn District Council had four timber bridges three of which had weight restrictions and one had a speed restriction. The restrictions effectively prohibited farm machinery and heavy vehicles from accessing properties in this area without an extensive 16 km detour.

The valley was an option for damming and flooding as part of the Central Plains Water Scheme. When this option was dropped Council funded the timber bridge replacement over two years. This was general rate funded rather than as subsidised minor improvements because Council wished to use the
minor improvement funding for intersection improvements on the more heavily trafficked arterial roads.
Two bridges were replaced in April and May 2014 and one in May/June 2015 with single lane, single span bridges. The remaining bridge on Malvern Hills Rd south west of Bush Gully is a shorter span with a speed restriction only. The funding was not sufficient to replace this bridge but we are working on a design and funding.
The use of precast concrete abutment and deck units and steel beams meant that the road closures were kept to a minimum (three weeks at each site).
The work was completed through our roading maintenance contract with the price submitted on a design and build basis.
Using the same design and combining the resource and building consent for the three bridges meant an efficient replacement construction that caused little disruption to the property owners.

Mark is the Team Leader Transportation in the Service Delivery unit at Selwyn District Council. He has worked at Selwyn District Council (and Ellesmere County Council prior to amalgamation in 1989) for 33 years predominantly on roading maintenance and construction.

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<td>3. Links to organizations working for the betterment of low-volume roads, including information about the TRB’s Low Volume Roads Committee</td>
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