

Chairman's Column

There are plenty of REAAA activities coming up over the next few months.

- ❖ First the Low Volume Roads Workshop "Protecting the Critical Infrastructure" will be held in Christchurch on the 17th and 18th of July.

An excellent program has been developed which you can read more about in the article later in the newsletter. I look forward to seeing you there.

- ❖ We have decided this year to hold the Chapter AGM in conjunction with the Low Volume Roads Workshop, and from then on in conjunction with the roadshow. This year's AGM will be held on Friday 18 July at 12:30pm in Christchurch.
- ❖ The annual roadshow will be held this year in August and September. This is always a popular event and this year we are continuing our themes of innovation and turning research into practice.
- ❖ The Management Committee is always conscious of delivering value to the members. As part of this, over the next month or so we will be issuing a questionnaire aimed at finding out what you value and how we can improve service to you. Please take the time to fill this in as it will help us focus our activities on what you want.

Heads of Roads Authorities Meeting and REAAA Council Meeting in Cairns

These two meetings were held in conjunction with the REAAA/ARRB Conference in Cairns in May.

It was the second Heads of Roads Authorities meeting after last year's inaugural meeting in Kuala Lumpur. This is a major initiative for the REAAA as it facilitates discussions on regional issues and the exchange of ideas between the seventeen countries represented. This year's meeting took its themes from the keynote addresses at the conference on Asset Management and Road Safety. Lively discussions on these topics ended with agreement that the New Zealand Chapter help determine training needs in Asset Management in the Pacific Islands with a view to arranging a roadshow covering the key topics.

The Council Meeting highlighted the need to grow membership in all countries as well as establishing new

Low Volume Roads Workshop

This year's Low Volume Roads Workshop is in Christchurch on the 17 and 18th of July. The organising team has done a great job organising sessions and technical speakers on the Workshop's theme of "Protecting the Critical Infrastructure".

Two international speakers will be there. Yves Provencher from the Forest Research Institute of Canada will discuss how some of the Canadian Research may be applied to the New Zealand environment and George Guimarra from ARRB will provoke discussion on how we can better meet the Infrastructure Challenge.

The focus of the workshop is to create an environment for interactive and lively debate while sharing knowledge. It is also a great chance to debate the merits of current national and international practices.

At the same time the Social Committee promises an entertaining conference dinner and evening.

Registration forms are available from the web site <http://www.roads.co.nz>

Chapters. As a result there is a whole organisational emphasis on delivering value to members. Key initiatives to help with this include;

- * Increasing local activity
- * The establishment of the new REAAA websites (<http://www.reaaa.org> and New Zealand)
- * The establishment of a resource centre in Malaysia which would be the Malaysian PIARC WIN node and include a comprehensive road engineering library which would be a repository for information on developing technologies, experiences, best practices and results.
- * Surveying members to better target activities
- * Improving the focus and content of the REAAA journals and newsletters

Contribution and enquires

This newsletter is published for the benefit of members. Contributions can be sent to the secretary at the address below. Enquires about the chapter may be directed to the Chairman.

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Newsletter of the ROAD ENGINEERING ASSOCIATION OF ASIA AND AUSTRALASIA NEW ZEALAND CHAPTER



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The 21st ARRB and 11th REAAA Conference Report

The 21st ARRB and 11th REAAA Conference was held in Cairns, Queensland, Australia from 18-23 May 2003

The Conference was jointly presented by ARRB Transport Research and the Road Engineering Association of Asia and Australasia.

Despite the uncertainty created by the SARS virus and the Iraq conflict over 600 delegates from 40 countries attended. New Zealand was well represented with 60 delegates attending.

The conference theme was "Our highway to a sustainable future". Keynote speakers were from Australia, Japan, Malaysia, Singapore, India and the USA.

Over 200 papers and workshops covered the latest thinking in areas such as the environment and sustainability, Intelligent

Transport Systems, traffic and transport modelling, road safety, and pavement materials and design. The Conference provided an ideal forum for delegates to catch up on old friends and attendees and their partners were well catered for with a Happy Hour on the first night and a cocktail evening on the last. The conference dinner held on the Tuesday night was well attended and was sponsored by the Cement & Concrete Association of Australia. A lot of delegates also took the opportunity to visit the Great Barrier Reef and enjoy the superb weather.

Copies of papers presented at the Conference are available on CD. Please contact a REAAA NZ Committee member to obtain these.

Conference Report - Prepared by Graeme Henderson

Opus Research to develop new Road Surfaces and New Pavements

Opus Central Laboratories has recently been awarded a research contract by the Foundation for Research Science and Technology to lead a four-year, multidisciplinary, collaborative programme to develop new road surfacing and pavement products that will reduce costs and present export opportunities for the road construction industry. The research involves collaboration between Opus Central Laboratories, the University of Canterbury, Transit New Zealand and private industry. The team includes expertise in pavement and surfacing engineering, bitumen chemistry, finite element modelling and behavioural science.

An efficient road transport system is essential in maintaining and enhancing the international competitiveness of the economy. Nearly all roads in New Zealand are chipseals built over flexible pavements, a design concept developed in the 1930s. The inadequacies of this approach for modern traffic demands are evident in their very high maintenance costs and poor performance (short lives, high noise, loose chip), particularly in urban areas and in areas subjected to increased forestry and dairying traffic.

The research will look to solve these problems by:

- developing new lower cost techniques for the repair and strengthening of existing road pavements that will increase pavement life and allow heavy vehicle limits to be increased, hence improving the cost efficiency of freight movement.



Based on an estimated reduction of pavement construction expenditure of 50%, this research will effectively result in a double the length of road that can be upgraded.

- developing a new type of road surfacing that can serve as a cost-effective, long-lived and low-noise replacement for highly trafficked chipseals and in many situations for asphalt mix.

Pavement strengthening will be achieved using a novel edge reinforcement method using specially designed stabilised materials.



One aim of the Opus led research is to enable mass of 60 tonnes (equivalent to Australia).

The new surfacing will be developed using a sophisticated finite element design approach and involve development of high tensile strength bitumen materials and specialised additives to achieve asphalt mix-like performance at much reduced cost. The new road surfacing and pavement materials and techniques developed in this programme will generate benefits through lower road maintenance costs and the development of high-value products with an international market. Other benefits include, reduced freight costs, CO2 emissions and noise in urban areas.

To assist implementation of the research findings an advisory group representing a cross section of key industry groups and end users of the research is to be established. The group will meet at intervals to discuss progress and direction of

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Application of dTIMS Model:

Experience on the Northland State Highway Network

The State highway "Performance Specified Maintenance Contract" PSMC002 was awarded to Works Infrastructure Limited (Works) in October 2000. The contract is for period of 10 years.

Two procedures have been carried out which can be applied to any network. These are described below, together with their effect on model output.

1. Review of Network Condition

In August 2002, Works' Operations Manager Gary Clemmett carried out a drive over of the 710 km of State highway to satisfy himself as to the condition of the network, after two years of maintenance activity. Four states of need for rehabilitation were assigned, and are described with their distribution in the table following.

Condn	Description	%-age
1	Excellent condition: minimal work needed.	51
2	Very good condition: requires some routine repairs.	34
3	Deterioration apparent: significant repairs needed.	13
4	Rehabilitation need imminent.	2
	Total Road	100

Only 2% of the network is in need of immediate rehabilitation, implying a 50 year cycle time, and half of the network is in excellent condition. A spreadsheet showing the condition of consecutive lengths formed the basis for calibration of the dTIMS model.

2. Incorporation in dTIMS Model Setup

A machine-measured measured parameter within the dTIMS model input that correlated best with the maintenance costs would enable the condition to be projected into the future.

"Mean rut depth" had the highest correlation of four variables examined, with maintenance need (95%). This is a physically tenable answer. The rut trigger was adjusted in the model until the total quantity of rehabilitation treatment approached that being observed in the field. This resulted in calibration at a "network level."

But how well were individual projects being predicted within the model, in terms of location and timing? This is examined below.

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the work, and provide a mechanism for early uptake of the research by the industry. The group includes representatives from Transit NZ, Transfund, Wellington City Council, Opus International Consultants and Delta Corporation. Those wishing more information regarding the programme should contact the Research Strategy Manager Peter Thorby by email: peter.thorby@opus.co.nz or Phone 04 587 0600



Opus researcher, Bill Wood measures sound level changes due to the resurfacing of an urban road.

Typically noise reductions from chipseal to asphalt are in the order of 3-5dB, and the same would be expected for the new surfacing being developed.

3. Validation of Model

The model was run with start conditions set to values applying at the commencement of the contract - two years ago. Output was compared with the two ensuing years of actual work done.

As with the tender model, the network is divided into (centreline) sections of nominally 200 m length. Each section was compared with the work done. For the purposes of this validation, the two years were regarded as a single period of time.

This approach is a far more stringent test than that normally applied, for two reasons:

- ▼ Small sections lengths are being compared, much shorter than RAMM treatment lengths
- ▼ Actual work already completed, rather than adjudged likely future maintenance needs, is being used as the basis for comparison with model output. The former is certain, the latter subject to opinion.

Two types of treatment were examined, namely:

- ▼ Reseal and
- ▼ Rehabilitation

The comparison of predicted and actual work recognised different degrees of "strike". These are described below:

Goodness of Strike	Description
1. Ideal	Same treatment, same section, either year
2. Less than ideal	<ul style="list-style-type: none"> ▶ Either treatment, same section, either year ▶ Same treatment, same/adjacent section, either year
3. Still less than ideal	Either treatment, same/adjacent section, either year

Two budget levels were compared: the unlimited ("Unconstrained") budget, and a budget level near to the minimum for which optimisation was achievable within dTIMS.

Results are summarised below, where a "group of 3" sections is the same or adjacent section of road. The constrained budget is the near-minimum sum at which optimisation is just able to proceed.

Unconstrained Budget

Sections in Groups of	Re-seal	Rehab	Either Treatment
1	47%	42%	46%
3	67%	54%	65%

Constrained Budget

Sections in Groups of	Reseal	Rehab	Either Treatment
1	14%	4%	12%
3	27%	11%	24%

There is clearly a much better correlation with an "Unconstrained Budget" than with the constrained condition, indicating the strong influence of performance, rather than budget, in treatment selection. This is the essence of a "Performance Specified Maintenance Contract."

The strike rates associated with unconstrained budget are encouraging: in general, a strike rate of around 70% is regarded as very good indeed, and this is for the usual less severe test condition.

SUMMARY

The dTIMS setup for the Northland State highway network has been calibrated following network-wide survey of current condition, and validated against historic work under a more stringent regime than usual. A satisfactory outcome has resulted.

The validation confirms that the contract works are being driven by "performance," rather than "cost" considerations. This accords with the intent of a "Performance Specified Maintenance Contract."

David Hutchison, Technical Services Engineer, Works Infrastructure Limited

New Website for Roothing Industry

The REAAA NZ Chapter has launched a new website to act as a portal for the roading industry. How often have you thought "where would I find when that conference was on and what website would have the details"? Well all that information is now available in one easy location at www.roads.co.nz.

The site contains a calendar of events, provides links to REAAA information and activities, hosts the Low Volume Roads workshop website, provides links to the Transfund research information and also to the stock effluent information available about sites constructed in various parts of New Zealand.

Also available are easy links to key roading organisations and all REAAA institutional members have their logos and links to their own website accessible from the web pages.

All of the information is also available using an alternative name www.reaaa.co.nz



REAAA Roadshow 2003

The REAAA are again holding an annual Roadshow to take place throughout the country between 27th August and 3rd September.

As in past years we have endeavoured to provide a wide mix of topics that will be of interest and informative to Contractors, Consultants, TLA representatives and others involved in the roading industry.

These will include Asphalt Surfacing, Traffic Noise, ITS, Geosynthetics and a range of local topics.

Venues and dates are as follows:

Wednesday 27 August 2003	Dunedin
Thursday 28 August 2003	Christchurch
Monday 1 September 2003	Wellington
Tuesday 2 September 2003	Taupo
Wednesday 3rd September 2003	Auckland

A detailed agenda and venue details will be sent out in July as