Austroads Pavements Technology Initiatives working with Industry in delivering achievements and future directions – Part 1

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AUSROADS
An Overview
- Association of Australian & New Zealand road / road transport authorities
- 11 members include:
  - six Australian states
  - two Australian territories
  - Australian government (DoIT)
  - Local government (through ALGA)
  - New Zealand Transport Agency
- annual budget about $14m

AUSROADS
Delivering Road Research via Taskforces
- While there are over 12 Task Forces the most relevant ones to AAPA are
  - Pavement Technology and
  - Asset Management

Austroads Pavements Technology Taskforce comprises:
- All road authorities in Australia and New Zealand
- Industry including AAPA represented by John Lambert
- Local government representatives
- National Transport Commission
- ARRB as SME and project leaders for much of the research.

Austroads working through the Pavement Technology Task Force produced the updated Guide to Pavement Technology including:
- Part 4B Asphalt
- Part 4F Bituminous Binders
- Part 4H Test Method
- Part K Seals
- Part 4J Aggregate and Source Rock
Updated on a rotating 5 year cycle.
Austroads is working to:
- Harmonise the guides to achieve consistency across Australia and reduce/minimise the need for supplements.
- Identify with Industry issues that require improvement including research.
- Ensure guides are reasonable, readable and can be used by their target audience.

Austroads Guides recognise that individual road authorities have significant differences to manage such as:
- Traffic volume
- Traffic type
- Climate etc.

The Guides provide for various pavements and pavement treatments to meet such needs. But many differences can be minor and need to be rationalised in favour of a national and consistent approach. Productivity will be the winner.

Pavements have been in the forefront of Austroads research in recent years with budgeted funds as follows:
- $1.8M (16%) 09/10.
- $2.5m (22%) 10/11
- $3.7m (25%) 11/12
- $3.8m (25%) 12/13

This does not include contributions in kind which industry and in particular AAPA have contributed towards specific research projects.

I would like to thank all the industry members and companies who assisted the Pavements Technology Taskforce and the working groups over the past 4 years.

A special vote of thanks to John Lambert of AAPA who supported and encouraged the collaboration between Austroads and industry.
Austroads
Improving Australian and New Zealand transport outcomes

John Spathonis
Program Manager (Technology) - Austroads

Pavement Research highlights for 2013/14

Austroads research program areas

- Technology
- Assets
- Freight
- Safety
- Network
- Registration & Licencing

Technology program task forces

- Pavements
- Bridges
- Tunnels
- Road design
- Project delivery
- Economic evaluation & planning

Pavements research topic areas

- Sprayed seals
- Asphalt
- Pavement design
- Vehicle damage
- Rehabilitation
- Updating manuals and guides
- Review of CPEE training courses

Impact of new freight trucks on existing pavements

- part of Austroads assets program
- impact of heavier vehicles on pavement surfacing needs to be quantified
- lack of guidance regarding the assessment of the impacts of horizontal tyre forces for new freight vehicles in current PBS
- development of vehicle simulation modelling to predict horizontal loads applied by SMART trucks and pavement wear
- development of incremental price and mass-distance charging of heavy vehicles
- tyre - force and surface wear mobile rig built in 2012/2013.
Impact of new freight trucks on existing pavements

Maximising use of RAP in asphalt mix design

- significant economic and environmental benefits
- due consideration of RAP during the mix design process needed to ensure satisfactory performance
- 2nd year of 3 year study
- provide guidance on the design and specification of RAP mixes
- overall goal to reduce uncertainty surrounding the performance of mixes containing RAP

New long-term ageing tests for bitumen and PMBs

- current long-term ageing test methods unsustainable (Shell sliding plate) and testing time approx 14 days
- new method being developed will maximise the cost effectiveness and life of sprayed seals
- in addition to testing bitumen, new test must also have the ability to test PMBs
- development of a more robust durability parameter
- investigating two test methods using a dynamic shear rheometer (DSR) device and an Australian device (extensiometer)
- benefits - shorter test time 2 days and utilise existing laboratory equipment

Extensiometer - mould and sample under test

Performance evaluation of granular bases

- traditional materials depleting as road freight demand rises
- development of effective methods for evaluating the performance of UBGM and promote fit-for-purpose approach
- comparison of field performance using ALF and lab processes to support use of wheel tracker testing procedure and repeat load triaxial (RLT)
- increase pavement performance and improve use of existing and new pavement materials

Performance evaluation of granular bases
Maximising performance of sprayed seals

- spray sealing viable low-cost solution for surfacing Australia’s vast rural pavement network
- maximising performance critical
- research into seal-design improvement methods to sustain heavy vehicles
- improvement for seal-design in low traffic environments
- feasibility study for a lab performance fatigue predictor test of spray-seal binder cracking
- trial spray-seal construction in collaboration with Sprayline at a pre-determined test site

Characterisation of PMB performance to achieve enhanced performance

- binder is key component in the performance and service life of bituminous surfacings
- need to improve specifications for procurement to achieve optimum performance
- aim to identify the relationship between test properties and field performance of PMBs
- investigate whether segregating PMBs will show same performance as non-segregating PMBs
- test the effect of polymer degradation on the performance of PMBs

Mix design and field evaluation of FBS pavements

- improvement of marginal materials using recycling techniques known as ‘stabilisation’
- bitumen stabilisation has become increasingly popular in Australia—particularly the use of FBS
- need to improve understanding of the performance of FBS materials under traffic loading
- finalising improvement of current Austroads mix and pavement design procedures
- monitoring the performance of under-designed FBS pavements

Improved design procedures for asphalt pavements

- purpose of project to provide improved procedures for designing longer-life asphalt pavements
- development of an improved model for fatigue damage prediction
- new procedures for determining asphalt moduli
- develop improved models for temperature prediction in deep lift asphalt pavements
- single temperature model → multi layered multi temperature model
- evaluation asphalt endurance limits methods
- eventual integration of long-life pavement design concepts into Austroads Guide to Pavement Technology Part 2
National spray-seal trials

- monitor, interpret and report on the to-date performance of the Austroads Polymer Modified Binder sprayed seal trials on-site inspection of test sites
- collaborative partnership with industry including knowledge transfer and asset management
- develop and promote best practice and innovation

High modulus asphalt technology transfer

- French laboratory – Laboratoire Central des Ponts et Chaussées (LCPC) developed methodology for a enrobé à module élevé Class 2 material
- Enrobés à module élevé Class 2 = EME2

High modulus asphalt technology transfer

- French EME mixes offer the advantage of reduced asphalt thicknesses, and lower construction and maintenance costs
- assist industry in the successful transfer of EME technology to Australia
- Initial reference testing of French EME2 mix to be conducted at ARRB to set benchmarks for mix-design using Australian test methods
- eventual development of Australian performance-based design guides for EME mixes
- challenge and opportunity for asphalt industry for a paradigm change

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