

2nd ARRB International Conference on Sprayed Sealing

Melbourne

10 – 12 October 2010



*Sustaining
Sprayed Sealing Practice*



Participants

- 250 delegates
- 14 RSA delegates
- 6 “ex RSA” delegates

Participants

Rob Vos

Trevor Distin

Mervyn Henderson

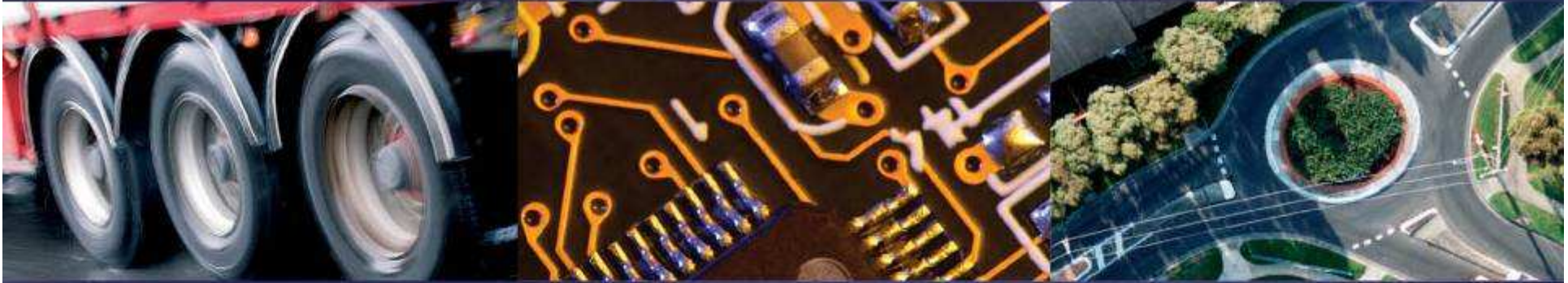
Enrico Fletcher

Tom Gilbert

Joe Grobler jnr

RSA Papers

- 8 Papers
- + Country issues
- + Hypothetical Case study to analyse different design methods

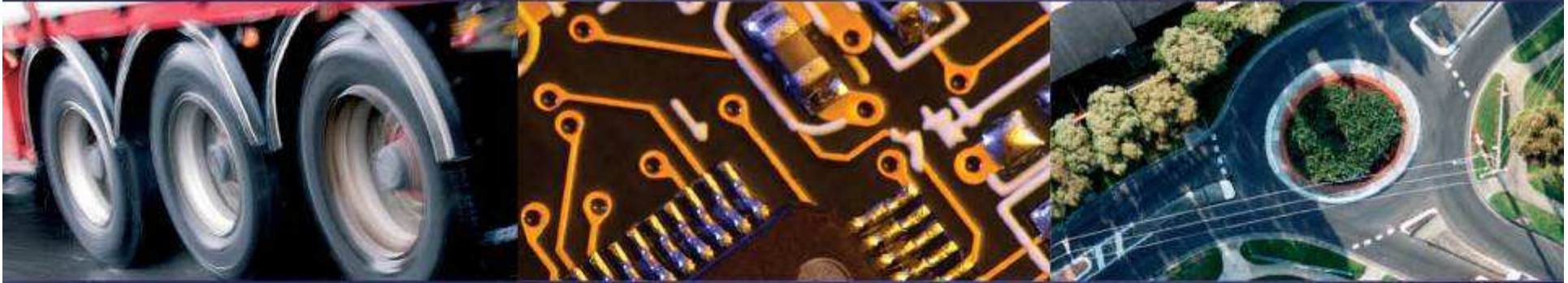


Country biggest issues:
Australia
New Zealand
South Africa



*Sustaining
Sprayed Sealing Practice*





Country biggest issue: **Australia**

Kym Neaylon, ARRB



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Australia: Biggest issues

1. Preparation of base-course prior to sealing
2. Sustaining the existing network
3. Skills

Issue 1: Preparation of base-course

What is the issue?

- 90% of Australia's pavements are flexible thin granular
- Surfaced with a sprayed seal
- Poor surface preparation → early sprayed seal failures → early structural failures

Issue 1: Preparation of base course

What can happen? Cont.

- Segregation of crushed rock and fines
- Surface is 'slurried' to give good ride
 - Embedment
 - Slurry shrinkage cracks
 - Delamination
- Pavement density obtained but not surface hardness
 - Embedment

Issue 1: Preparation of base course - embedment



Issue 1: Preparation of base course - delamination



Issue 2: Sustaining the existing network

What is the issue?

- Sustaining the existing network has three parts
 - Difficult loading conditions
 - Quality materials
 - Funding

Difficult loading conditions



Difficult loading conditions



Issue 2: Sustaining the existing network

What is the issue? cont.

- Quality materials
 - Marginal pavement materials
 - Usually use locally available materials
 - The best local material may have already been used
 - Sealing aggregate
 - Usually use locally available materials
 - The best local material may have already been used
 - BCR of carting best aggregate long distances?

Issue 2: Sustaining the existing network

What is the issue? Cont.

- Difficult loading conditions
- Quality materials
- Funding is competitive
- Nation can't afford a large network of heavy duty pavements and asphaltic concrete

Issue 3: Lack of Skills

What is the issue?

The 'old timers' are moving on, the 'youngsters' have not been trained, or are they looking for a different lifestyle?

Dwindling skills are apparent in

- Treatment selection
- Design
- Construction
- Specification writing

Australia's biggest issues

1. Preparation of base course prior to sealing
2. Sustaining the existing network
 1. Quality materials
 2. Increased loadings
 3. Competitive funding
3. Dwindling skills

What happens if nothing is done?

- Money is not used efficiently
- Won't be able to use sprayed seals
- Loss of all weather roads in rural communities

Issue 1: What is being done?

Preparation of base course prior to sealing

The solution is not new – but we need to “re-discover” it

- Change to specifications
- Practical training
 - By jurisdictions
 - By industry
 - Australian Asphalt Pavement Association
 - Caterpillar Institute
 - Civil Contractors Federation
 - etc

Issue 2: What is being done?

Sustaining the existing network

- Quality materials
 - Austroads/ARRB Research
 - TT1352 Scarce and quality resources
 - quarantining particular quarries for particular use needs a political solution, not technical
 - TT1354 Optimising binder performance
 - AT1612 Alternatives to bitumen
 - TT1665 PMB sprayed seal trials

Issue 2: What is being done?

Sustaining the existing network cont.

- Increased loadings
 - Austroads/ARRB Research
 - AT1540 Horizontal shear on pavement surfaces
 - TT1357 Seal design & performance
 - AT1536 Good practice reseal management

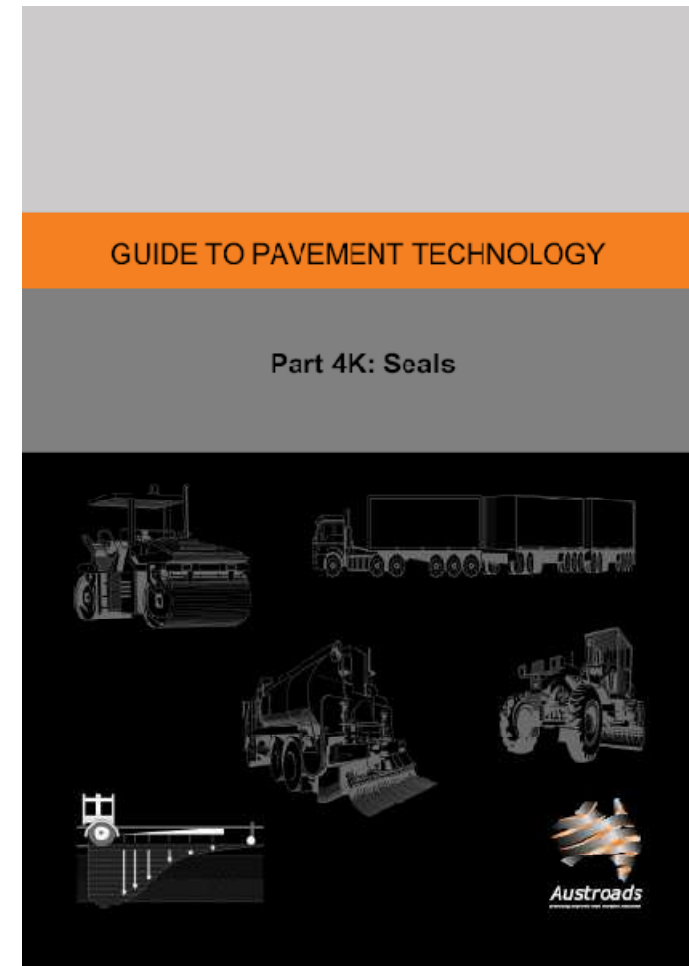
Issue 3: What is being done?

Dwindling skills

- Training
 - ARRB/Austrroads
 - Australian Asphalt Pavement Association
 - Centre for Pavement Engineering Education
- Knowledge capture
 - Austrroads Guides to Pavement Technology
- Knowledge transfer
 - Bituminous Surfacing Research Reference Group
 - Austrroads/ARRB Research & Technical reports

Knowledge Capture

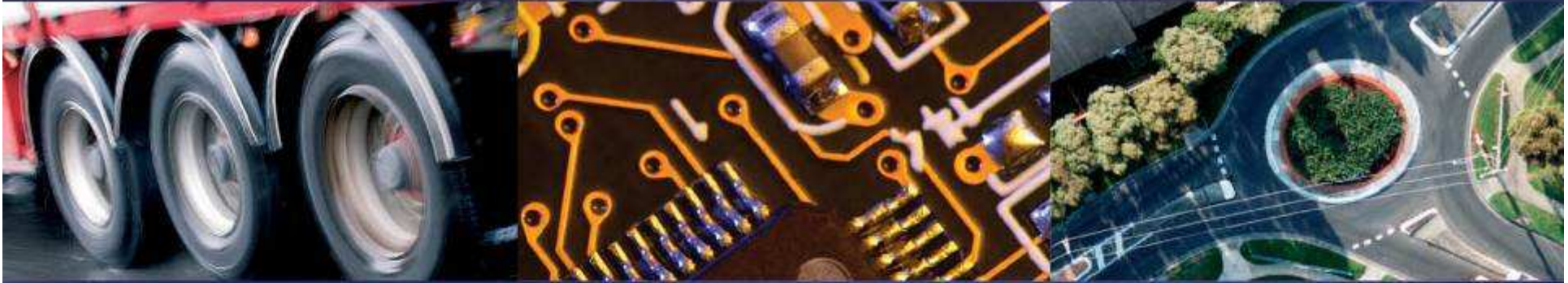
Austrroads ***Guide to*** ***Pavement*** ***Technology***



Parts of the Guide to Pavement Technology

The 22 Parts include.....

- Pavement structural design
- Pavement surfacings
- Pavement materials
- Granular base and sub base materials
- Bituminous binders
- Geotextiles and Geogrids
- Aggregate and source rock
- Seals
- Pavement maintenance
- Pavement construction
- Pavement work practices



Country biggest issue: New Zealand

Joanna Towler
NZ Transport Agency



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Future Affordability of Chipseals

12 October 2010

Presented by Joanna Towler, NZ Transport Agency

By Joanna Towler, Operations Group, Highways & Network
Operations, NZ Transport Agency and
John Patrick, Opus Central Laboratories

Vehicle Dimensions and Mass Rule



Effect of Increase in Heavy Traffic Volumes

– Now

- Flushing
- Skid Resistance
- Cracking
- Stress

•After Increase

- Premature flushing
- Accelerated polishing
- Increase in pavement defects
 - Cracking
 - Rutting
 - Shoving

Cracking and Pavement Distress



Pavement Distress

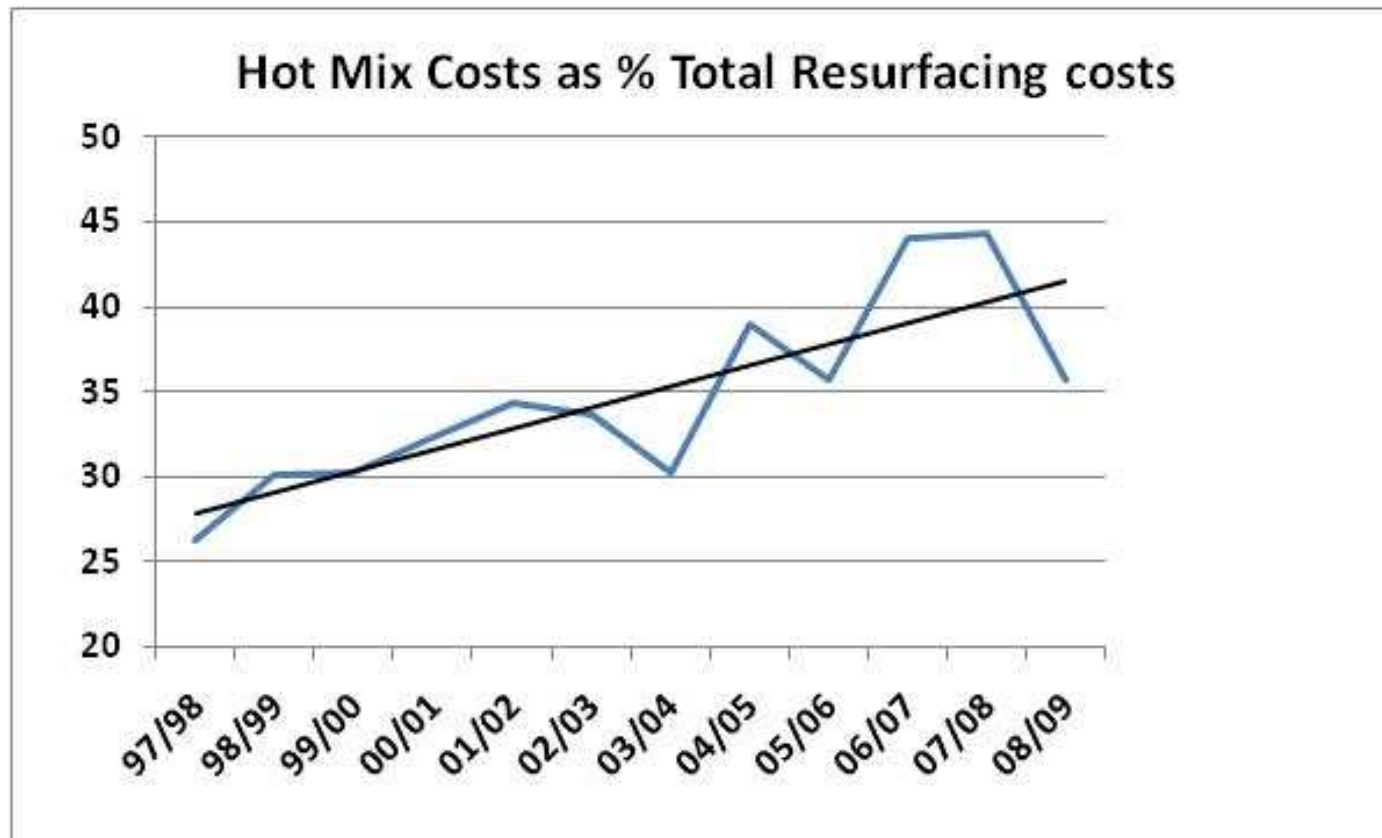
– Current Practice:

- More use of hot mix
- More rehabilitations
- More expensive!

Need:

- Surfacing that perform under stress
- Solutions ensuring on-going integrity of state highway pavements with long life and optimised whole-of-life costs.

Trend towards more hot mix



Skid Resistance



Skid Resistance

– Current Practice:

- Accelerated polishing of surfacing aggregates
- Resurfacing more often
- Higher performing skid resistant aggregates and surfacing systems (expensive)

Need:

- Better understanding of on-road performance of existing aggregates
- High skid surfacing systems with long life

Flushing





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2010



Flushing

– Current Practice:

- Shorter chipseal lives as sealing chips are driven into the substrate more rapidly
- Premature flushing, shortening seal lives
- More unstable seal layers – expensive to repair
- Recycling

Need:

- Better understanding of the triggers that cause flushing
- Sealing systems to prevent layer instability

Short Term Strategy

Need:

- To identify seal designs and other maintenance and construction factors most likely to prevent or mitigate flushing
- Multi-coat (two-coats, sandwich seals)
- Additives (polymer, rubber)
- Active traffic control
- Preventing over-chipping
- Emulsion – potential benefits?

Long Term Strategy

Need:

- Chipseals that perform under stress
- Better understanding of the triggers that cause flushing
- Sealing systems to prevent layer instability
- Better understanding of on-road performance of existing aggregates
- High skid surfacing systems with long life

CONCLUSIONS

- Very similar “problems” : Aus – NZ – RSA
- Move towards emulsions?
- Bleeding/loss of skid resistance = reduced life
- Loss of skills
- Availability of good quality aggregates