

25th ARRB Conference

Perth, Australia
23 – 26 September 2012



Conference Feedback

24th Road Pavements Forum
2012-11-06

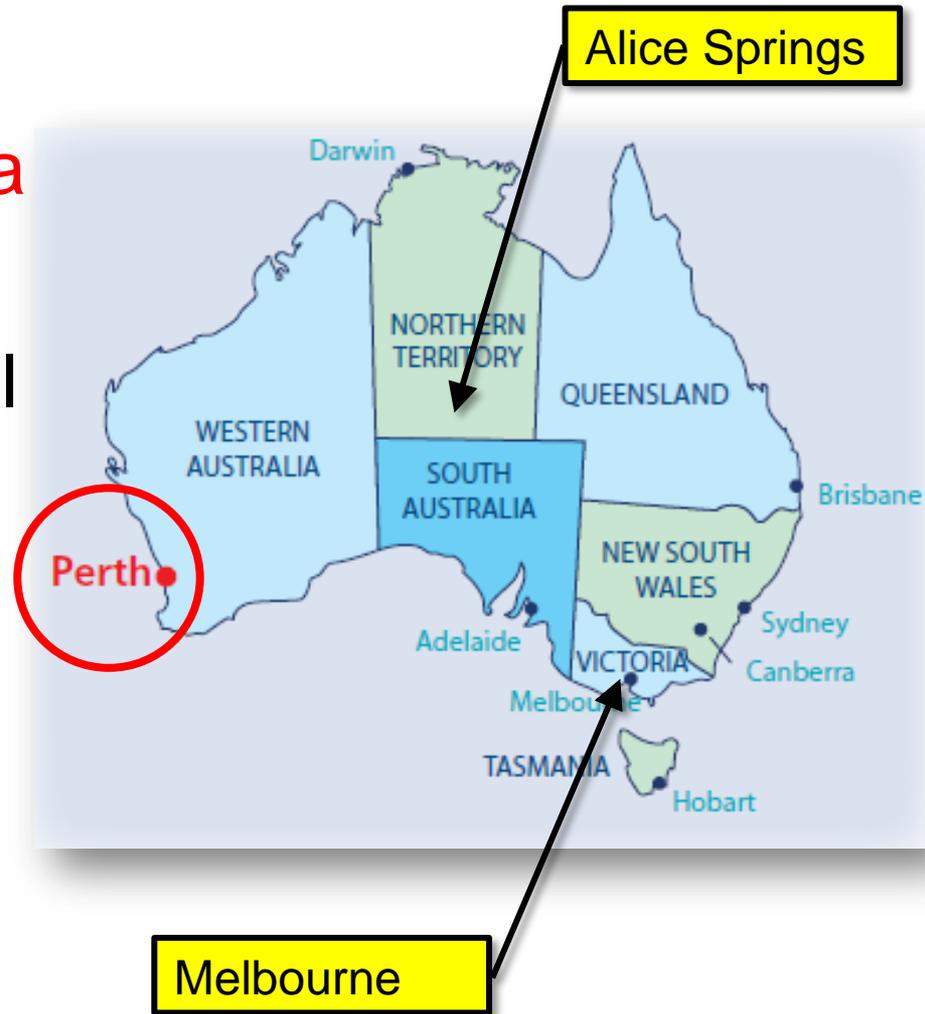
Gerhard Fourie
Danie Erasmus
Gerrie van Zyl



Creating wealth through infrastructure

PURPOSE

- **ARRB Conference,
Perth, Western Australia**
- Inspection of winter seal
trial sections near Alice
Springs, Northern
Territory
- Seals workshop at
ARRB, Melbourne,
Victoria



....also to meet a few Wallabies



25th ARRB Conference

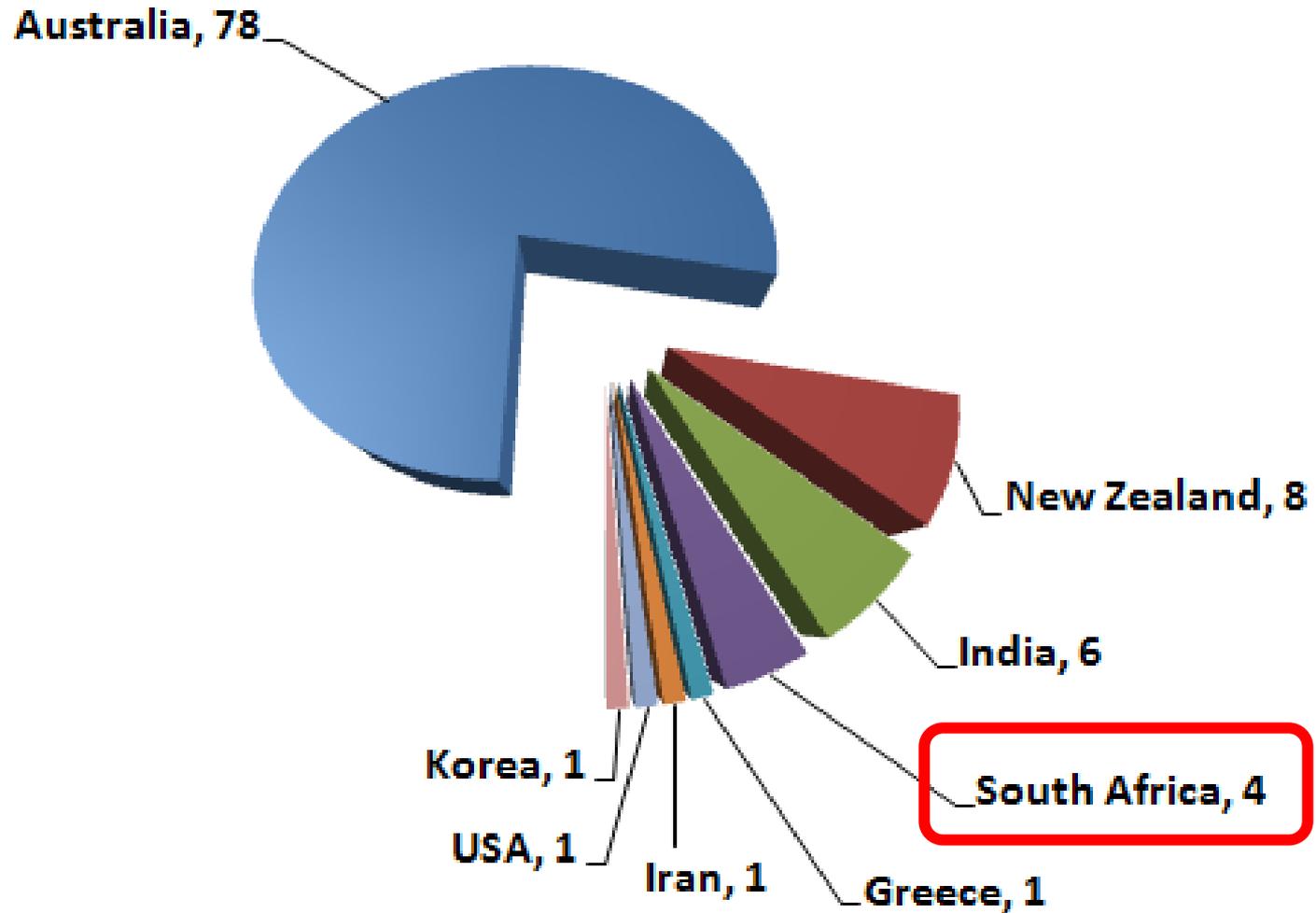
- Pan Pacific Hotel, Perth, Western Australia
- 23 - 26 September 2012
- Theme of the Conference :
“Shaping the future: Linking research, policy and outcomes”



ARRB Conference Detail

- Approx 400 Delegates (10 SA)
- 2 ½ days
- Keynote + 3 Plenary sessions, with the third session - joint day with the 35th ATRF Forum
- 29 Parallel technical sessions
 - 100 Technical Papers (4 SA - 2 by ex SA)
 - 5 Technical Workshops

Papers per Country



Keynote Address

FEHRL

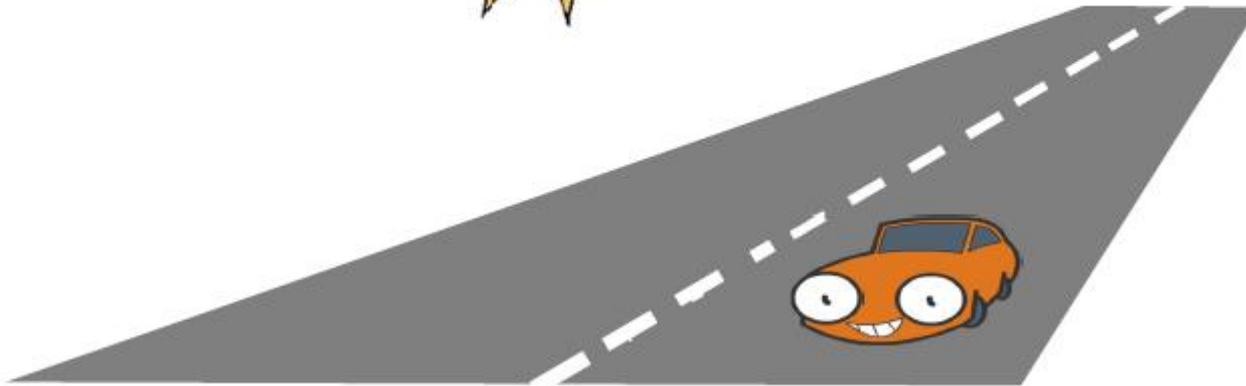
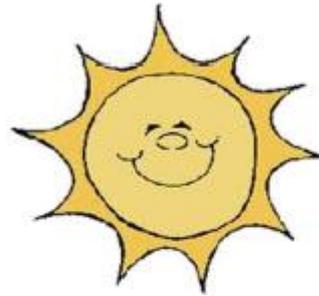
***Shaping the future: Linking
research, policy and outcomes,
'Forever Open Road'***

*Steve Phillips
FEHRL Secretary-General*

Forum of European National
Highway Research Laboratories (FEHRL)



Once upon a time..... roads were good





The 'evil road'

Polluting

Unsafe

Noisy

Crowded

Expensive

Killing the environment

Not nice to be near

Systems approach

Key Elements of Forever Open Road

ADAPTABLE ROAD	AUTOMATED ROAD	RESILIENT ROAD
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PUT WOW BACK INTO ROADS!

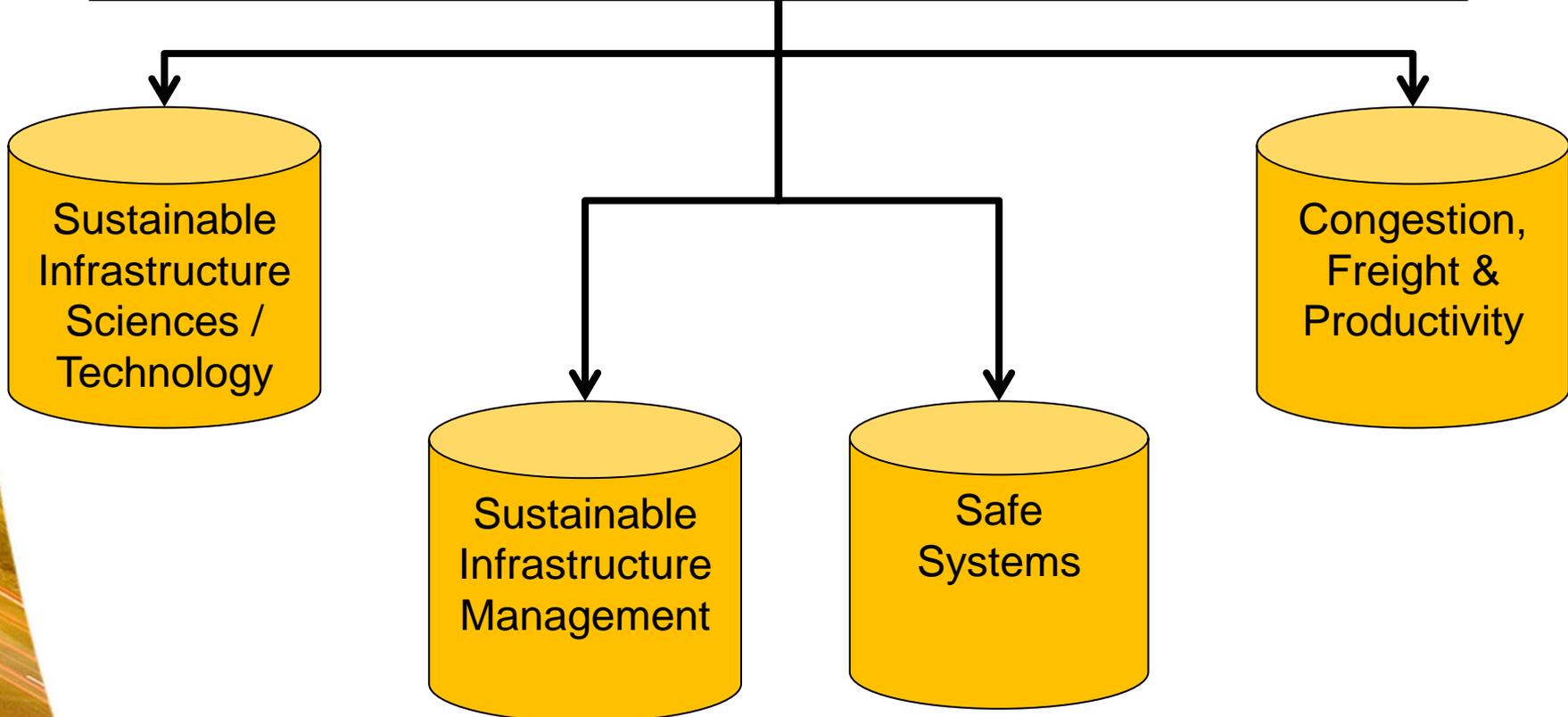
- We need start to develop the 5th Generation Road!
 - Solves existing and future problems
 - Achievable through new technology

LEADING INDICATORS:

- Energy efficiency of road transport
- Energy consumed by road operations
- Energy enclosed in materials
- Frequency and duration
- Cost to maintenance, repair, reconstruction and incidents
- Cost to fatalities and severe injuries
- Cost to theft and damage
- Quality, noise, natural habitat
- Cost of ownership

4 Pillars/Streams

*Shaping the future:
Linking research, policy and outcomes*



Plenary 1 - Improve productivity or perish!

- Australia depends heavily on road freight.
 - World leader in road freight productivity but that will not continue if it does not make improvements.
 - Some would argue that in the past 10 years little progress has been made.
 - What needs to be done to improve productivity?



David Simon
Chairman
Australian Trucking Association

Growth of the freight task

Australian freight task predicted to nearly double by 2030.

This will lead to:

- More trucks on the roads;
- Increased road wear;
- Greater safety risks; and
- Increased environmental impact.

Unless we improve efficiency:

- Higher productivity vehicles
- Heavy vehicle infrastructure



Improve Productivity or Perish: An International Perspective

Paul Nordengen
Research Group Leader: Network
Asset Management Systems
CSIR Built Environment
President IFRTT

09.07.2010



Plenary 1 - Improve productivity or perish!

Congestion, freight and productivity

Sustainable infrastructure sciences/technology

Sustainable infrastructure management

Safe Systems

Road freight productivity

Product certification and innovation

Bituminous binders

Bridge management & inspection

Road safety I

Heavy vehicle operations & technology

Pavement design I

Bituminous surfacings

Bridges, abutments & barriers

Network operations

Road safety II

Plenary 2- Balancing sustainability, road safety, network performance and community expectations

- Challenging - although an essential part of road network management
- This session explored how the road transport system can be managed :
 - to optimise environmental and road safety outcomes (including emissions in the transport sector)
 - within a Safe Systems context

....but...

....then I got stuck in elevator!...



....1 hour later...

Plenary 2 - Balancing sustainability, road safety, network performance and community expectations

Congestion, freight and productivity

Productivity initiatives in the freight and heavy vehicle space workshop

Sustainable infrastructure sciences/technology

Cementitious materials

Pavement materials

Microsimulation & advanced modelling I

Asphalt

Trip Generation, modelling & predictions

Lighting & Noise

Sustainable infrastructure management

Strategic planning & intelligent transport systems

Economics & sustainability

Asset management I & II

Condition data collection, management & analysis

Pavement Management

Safe Systems

Road safety engineering I & II

Traffic signals & intersections

BUT WILL IT WORK? Choosing and evaluating road safety treatments workshop

Plenary 3 - Shaping cities: The role of transport planning in the future

- This session, held on the **ARRB-ATRF joint day**, highlighted:
 - the changing role of transport planning focussing on recent major projects in Perth
- Many Australian capital cities face challenges in staying or becoming liveable and accessible cities for all.
- Critical that development planning addresses issues such as climate change, sustainability, population growth and social and cultural diversity.
- **Australasian Transport Research Forum (ATRF)**

Papers Relevant to Study Tour

- Several relevant papers but some can be highlighted

Austrroads PMB Sprayed Seal Trials

Steve Patrick, ARRB Group



Introduction

- Use of PMB in sprayed seals is increasing
- The latest Austrroads PMB specification framework AGPT/T190
 - Revised PMB classifications
 - New grade
 - Bounded specifications
- Trials will provide field validation



Austrroads PMB Sprayed Seal Trials

Steve Patrick, ARRB Group



Conclusions

- All PMBs in current specification included in trials
- Field trials assist appropriate binder selection
 - Longer seal lives
 - Reduced maintenance costs
- Collaboration between ARRB, road jurisdictions and industry



The effects of heavy vehicle single, tandem and triaxle groupings on sprayed seal wear

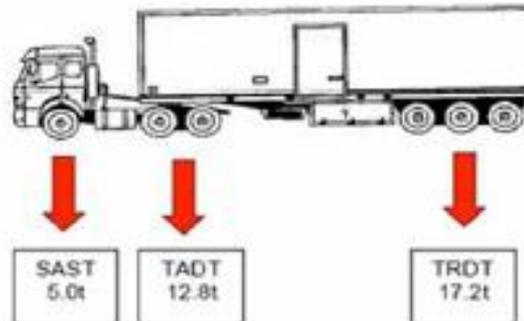
Kym Neaylon

National Technical Leader, Surfacing

ARRB



Objective



Pavement engineering – these axles cause **equal** damage
Surfacings engineering – do these axles cause **different** damage?

The effects of heavy vehicle single, tandem and triaxle groupings on sprayed seal wear

Kym Neaylon

National Technical Leader, Surfacing

ARRB



Result

The equivalent loadings, but in a clustered axle grouping, cause a significantly different reduction in surface texture

Single axle dual tyre 40 kN load	Tandem axle dual tyre 60 kN Load	Tandem axle dual tyre 80 kN Load	Triaxle dual tyre 90 kN load
ESAP ₄₀	Two ESAP ₃₀	Two ESAP ₄₀	Three ESAP ₃₀

Ensuring the Quality of SBS Modified Binders

Khar Yean Khoo and John Oliver



Background

- Styrene-Butadiene-Styrene (SBS) polymer modified binders can deliver improved performance over bitumen
 - greater crack and fatigue resistance
 - better rutting resistance
 - good adhesion to aggregate particles
- but SBS behaviour is very complex
- segregation and degradation can occur which could lead to field issues
- this can be avoided through proper binder formulation, manufacture and handling

Ensuring the Quality of SBS Modified Binders

Khar Yean Khoo and John Oliver



Conclusions (1)

1. SBS binders can deliver improved performance but require careful formulation and handling
2. Six of 12 random commercial samples segregated or degraded
3. If PMB binders segregate then
 - Quality Control Test results may vary if the batch is not appropriately mixed
 - different parts of a sprayed seal may have different polymer contents if the product in a sprayer is not adequately mixed
 - degradation of SBS polymers may result in changes to field performance

Seals Workshops (Perth & Melbourne)



1st Sprayed Sealing Alliance Best Practice Workshop (Perth)

- Aggregate rolling (Introduced by Kym Neaylon)
 - Pneumatic tyred rollers (and then can be either ballasted or unballasted), steel drum rollers, rubber coated steel drum rollers (can either be vibrating or no vibrating), combination rollers, etc.
 - Is there one best roller? When would you choose which type of roller, and why?
- Is it time to overhaul the Austroads PMB specs for sprayed seals? (Introduced by Vincent Conserva)
 - Why so many? S10E, S15E, S20E, S25E and S35E?
 - Maybe simply rename as LOW and HIGH?
 - Need for any other parameters?

1st Sprayed Sealing Alliance Best Practice Workshop (Perth)

- Winter seal options/ best practice/ risks.
(Introduced by Gerrie van Zyl)
 - Taking the winter embargo period and Christmas break into account, there is a high demand for binder and aggregate over a six-month period, resulting in project delays
 - Worsened by bitumen shortage, unforeseen climatic conditions etc.
 - The bottom line is that South Africa is having to investigate alternative options to do more sealwork throughout the year
 - Australian experiences and lessons learnt?

2nd Sprayed Sealing Alliance Workshop (Melbourne)

- Seal design construction by Gerrie van Zyl, Gerhard Fourie, Danie Erasmus
- Approach to periodic maintenance: SANRAL Western Region projects by Gerhard Fourie
- Long-term ageing test methods for sprayed sealing binders & low temperature - characterisation tests by Dr Young Choi
- Surface texture measurement for seal design input: Sand patch vs. laser texture measurement by Dr Young Choi
- Performing seals - 15 years' experience in the use of S35E PMBs by Stuart Dack
- Polybutadiene binders by Stuart Dack

2nd Sprayed Sealing Alliance Workshop (Melbourne)

- VicRoads Specification 408 by Colin Dailey
- Crumb rubber production and new developments in Australia by Jansz
- Ball penetration test by Kym Neaylon
- Bitumen in Australia and AS2008 - An update by Kym Neaylon
- Sprayed sealing using bituminous emulsions by Peter Thompson
- Binder/aggregate adhesion research - Determining updated cutter levels for PMBs used in sprayed seals by Robert Urquhart

Final Remarks

- SA not well represented
- Expected wider international participation
- Very interesting papers and workshops
- Successful study tour (Winter seals)

Thanks Mate!

