

Austroads

Improving Australian
and New Zealand
transport outcomes



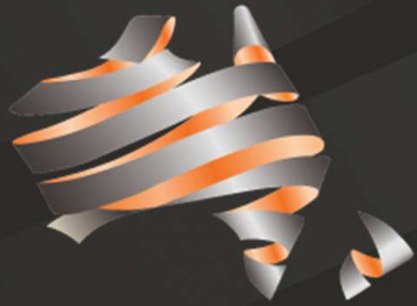
Developments in maintaining road infrastructure in New Zealand and Australia

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Outcome Delivery Manager NZ Transport
Agency





Association of Australasian road transport agencies

Members

11

Australian States and Territories
New Zealand Transport Agency
Australian Federal Government
Local Government (ALGA)

Budget

\$19.3m

\$1.0m Corporate
\$13.2m Work program/research
\$5.1m NEVDIS

National Office
Staff

7

7 National Office Staff
4 Program assistants (road agencies)
1 Cooperative ITS (VicRoads)
12 NEVDIS staff (NSW RMS)

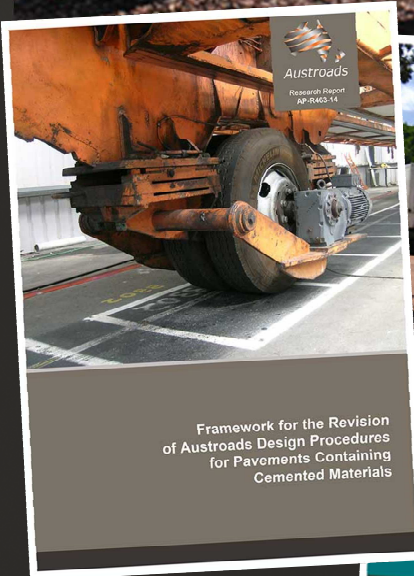


Activities



- **Research program:** 160+ research projects
- **Collaboration:** 26 national taskforces and working groups, representatives on 16 international technical committees

Publications: 90 + published 2012-13



Challenges for Australia and New Zealand



- Ageing assets
- Urbanised population
- Increasing freight demand
- Significant travel distance
- Export trade in primary products significant
- Extensive use of thin surface unbound granular pavements

Goal of research and development programmes on pavement management

- Deliver improved levels of service
- Reduce the cost of travel for our customers
- Increase the effectiveness and efficiency of pavement construction, maintenance and renewal

Improved service levels

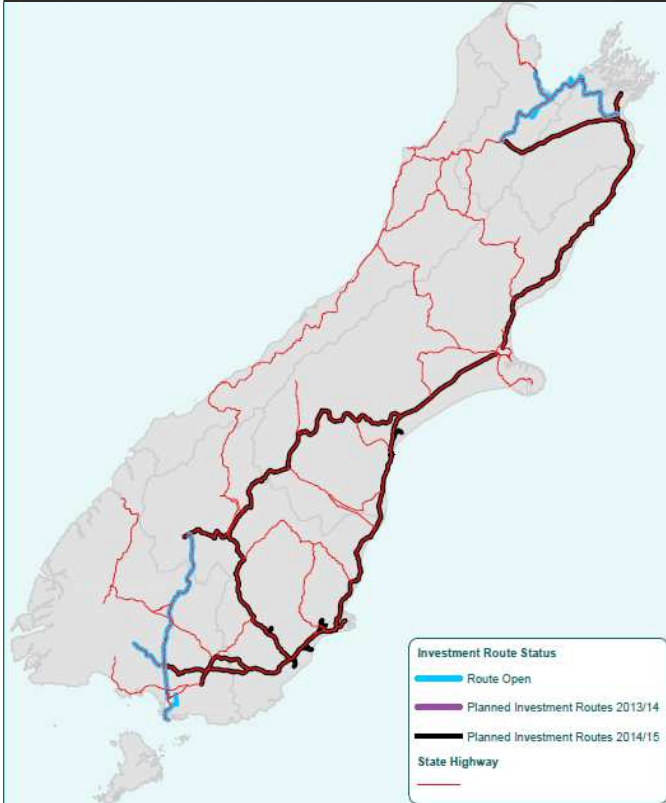


<http://www.nzta.govt.nz/vehicle/your/50max/index.html>

Increasing the carrying capacity of freight

- Reducing the cost of freight
- Improved axle configurations to increase payload without increased road wear
- Expanding the network accessible by heavy vehicles
- Improving ride quality

Improved service levels



Improved access for freight

- Improved resource utilisation by freight companies
- Defined heavy vehicle routes
- Reviewed capacity of bridges and pavements
- Strengthened weak bridges on a route

Improved service levels

<https://www.onlinepublications.austroads.com.au/items/AP-R409-12>

Improving ride quality

- Improving comfort, reducing fatigue, increasing safety
- Improving our understanding between road roughness measured by laser profilometer and impact on freight vehicles
- Truck ride index improves targeting of corrective works
- Austroads project AT1732, Defining asset management LOS requirements for freight on rural arterial roads.



Matching future service levels and funding

**Austrroads Project:
AT1920: Developing the
Data and Cost
Information Required to
Support the Heavy
Vehicle Charging and
Investment Reform**

Australian jurisdictions are commencing work to implement four reforms:

- developing road asset registers and assessments of road conditions according to agreed service level standards
- developing improved road usage data for demand forecasting
- publishing annual heavy vehicle road expenditure plans
- Enabling a dialogue between road agencies and their customers on the balance between service levels and cost



Pavement design tools and techniques

Didier Bodin et al:
APADS: finite element method software for enhanced pavement ..
26th ARRB Conference.
Austrroads Report: AP-T199-12

AustPADS - review of Circly

- To allow greater flexibility in design, non-linear modelling of materials, a path for future development
- Transitioning from CIRCLY to Finite Element Method Based Pavement Response to Load Model
 - linear-elastic materials
 - cross-anisotropy
 - nonlinear-elastic materials
 - simple interface



Material selection, testing and specification



**Austrroads Project:
TT1819, & reports:
AP-T240-13,
AP-T267-14**

Characterisation of Granular Materials Rut Resistance

- reduce road agency costs, by developing effective methods for evaluating the performance of unbound granular materials
- Two components:
 - Laboratory characterisation through repeat load triaxial and wheel tracker tests
 - Accelerated pavement testing

Material selection, testing and specification

26th ARRB conference papers
Phillip Herrington et al.:
Model for long term bitumen oxidation.
Steve Bagshaw:
Preliminary investigations of epoxy bitumen for resilient and sustainable chipseal (sprayed seal)...

New Zealand Performance based bitumen specification

- Proliferation of bitumen sources obviates reliance on default characteristics
- Properties specified to directly relate to in-service performance
- Based on AASHTO MP 19
- 3 grades over -7 to 55⁰C
- Factors:
 - Aggregate retention, Cumulative damage, Durability, Adhesion



Freight impact assessment

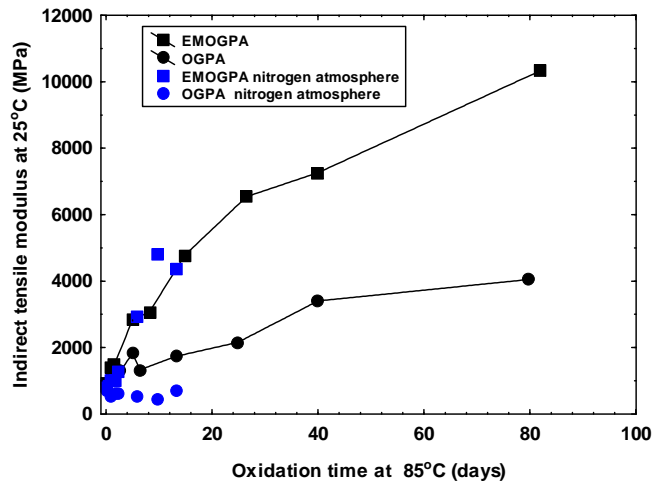
26th ARRB
Conference paper.
[http://www.arrb.com.
au/ARRB-
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Field Research of Road Wear

- Austroads Project AT1540 is investigating the relationship between horizontal forces from freight and road wear.
- Austroads Project AT1733 is reviewing the impact of dynamic wheel loading on road wear.
- Aid the economic configuration of freight vehicles and effectiveness of pavement and surface design



Treatment selection and performance

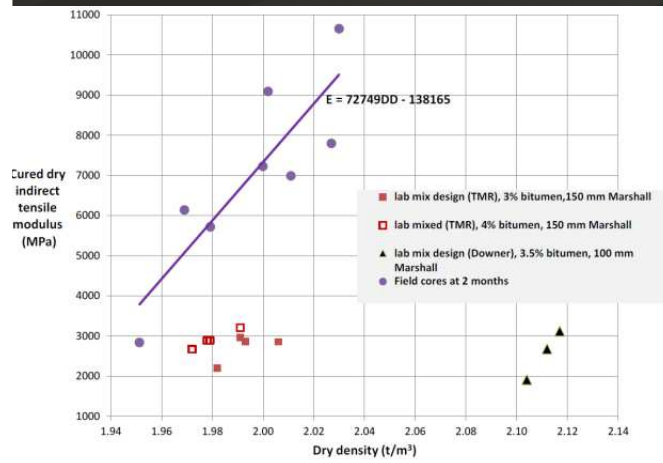


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Sessions 9 D
Alabaster

Long Life Epoxy OGPA

- Improves the effective service life of open grade porous asphalt
- Builds on OECD programme
- Epoxy used to reduce degradation by oxidation
- Potential service life of 25% EMOGPA increased from 8 to 40 years

Treatment selection and performance



**Austrroads project
TT1825, progress
report AP-T275-14**

Mix design and field evaluation of foamed bitumen stabilised pavements

- To harmonise practice reducing cost
- To standardise test methods for compaction, mixing and moisture content
- To improve predictability of early rut development, and long term distress to improve design procedures
- 5 trial sites tested, 3-3.5% bitumen, 0.8 – 1.5% quick lime/hydrated lime
- Improving understanding of test and in service modulus

Treatment selection and performance

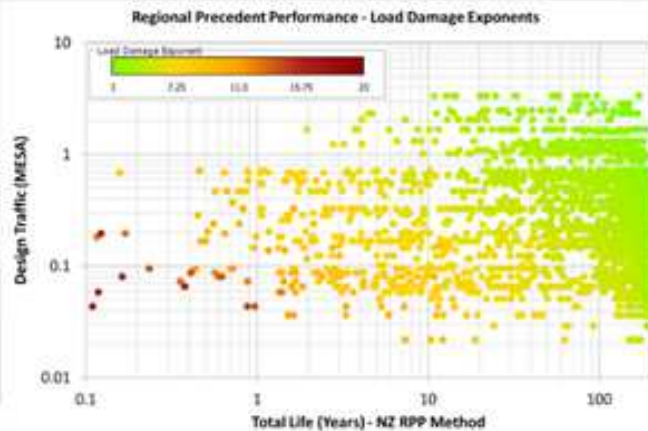


**Austrroads project
TT1820, report AP-
T262/14**

Maximising the performance of Sprayed Seals

- To understand the changed impact from modern multi-axle freight vehicles in seal design procedures
- Accelerated pavement tested used ALF in Australia and CAPTIF in New Zealand
- Results imply that surface texture damage is linear, a 1st power law

Condition assessment, programme development



<https://www.dropbox.com/sh/0fynqbmub212pbd/AAB7ZkNJY-r5PeRZ9mLLjrEza>
Sessions 7&13 G Salt

Routine network assessment Traffic Speed Deflectometer

- Network surveys have commenced to assess pavement condition and remaining service life more extensively and safely than possible with FWD surveys
- Analysis uses both derived FWD data and network specific decay models raw measurements, uses precedence analysis
- Results will be used to select treatment timing, type and extent potentially reducing works by 60%



Effective and efficient pavement maintenance and renewal

State Highway Activity Management Plan 2015/18

<http://www.nzta.govt.nz/network/management/draft-shamp.html>

Consistent nationwide risk managed approach in NZ

- Standardising approaches
- Nationwide assessment of minimum renewal quantities on 23 networks
- Standardising field and desktop review of resurfacing and pavement rehabilitation proposals – 15% reduction in programme
- Managing risk by deferring works on lower classification roads + specific condition monitoring to enable repairs, and inform risk assessment processes



Thankyou

