


Sustainability

Learnings from the AAPA Study Tours to the USA, Africa and Europe

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Sustainability

What does sustainability mean?
A sustainable industry?
A sustainable environment?
- Both -



Sustainability

Should we worry about sustainability?

People will always need roads
We have a new Government which is getting rid of the Carbon Tax
Whatever we do regarding greenhouse gas emissions will have almost no impact on climate change
Our product – asphalt is 100% recyclable




Sustainability

Should we worry about sustainability?

Of course we do:

- as responsible organisations and people
- to promote our low impact and sustainable industry
- to ensure that bituminous surfacing remains a strong, viable industry



Sustainability

Some responses



Asphalt Plant
Ballarat Vic



RAP



Storage Facility
Pinkenba Qld





Warm Mix
Asphalt


109.6 °




AAPA Study Tours


With this in mind Sustainability is one of the key issues addressed on AAPA Study Tours





Pre Tour Questions



Prior to each Tour AAPA seeks questions from delegates.

These questions are sent to those being visited.

These can be downloaded from the AAPA website.

AAPA 2012 STUDY TOUR QUESTIONS LIST 13 MAY 2012 (REVISED)

This document is for the 2012 Study Tour to the USA. It is a list of questions that delegates should bring to the tour. The questions are designed to help delegates understand the current state of the road industry in the USA and to provide a basis for discussion with their hosts. The questions are divided into two sections: 'Key Topics for the Tour' and 'Other Questions'. The 'Key Topics for the Tour' section includes questions on: 1) Long-life pavement performance, design, materials, cost, durability and access to performance data; 2) High performance asphalt & bitumen - the road to asphalt (HRA) - road mix, production, sustainability; 3) Sustainability: low/noise, low/noise, low/noise, low/noise & energy sources; 4) Health & safety: assessment of road users, health & safety issues for road users and workers; 5) Environmental: (a) environmental impacts of road construction, (b) 'green' pavement, (c) noise, (d) water, (e) air quality, (f) climate change, (g) energy, (h) recycling, (i) waste, (j) water, (k) air quality, (l) noise, (m) health & safety, (n) other.

Key Topics for the Tour

1) Long-life pavement performance, design, materials, cost, durability and access to performance data (performance, maintenance, climate and traffic) for example

2) High performance asphalt & bitumen - the road to asphalt (HRA) - road mix, production, sustainability

3) Sustainability: low/noise, low/noise, low/noise, low/noise & energy sources

4) Health & safety: assessment of road users, health & safety issues for road users and workers

5) Environmental: (a) environmental impacts of road construction, (b) 'green' pavement, (c) noise, (d) water, (e) air quality, (f) climate change, (g) energy, (h) recycling, (i) waste, (j) water, (k) air quality, (l) noise, (m) health & safety, (n) other.

Other Questions

1) Road design & construction

2) Energy and Carbon

3) Durability & performance - materials, binders and pavements

4) Resilience and recycling


5) Road pricing, tolls, and other

6. Social impact

7. Resilience sourcing and green procurement


8. Improving roads & safety

9. Financing of road infrastructure and maintenance




USA – Key Issues

2010 Study Tour to the USA



Three major questions related directly to Sustainability


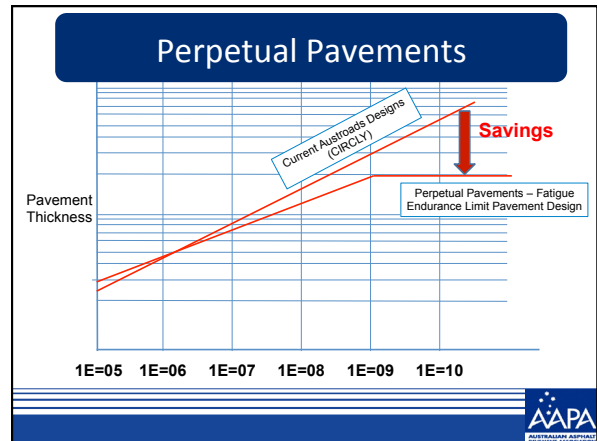
- Perpetual Pavements
- Warm Mix Asphalt
- Reclaimed Asphalt Pavements



USA - Perpetual Pavements

Observations

- Pavements designed according to the fatigue endurance limit give a long lasting pavement requiring minimal maintenance.
- Some pavement in US have lasted more than 60 years and still going.
- The Fatigue Endurance Limit is an accepted concept for pavement design in the US.

USA - Perpetual Pavements

Recommendations

- Australia should investigate opportunities to use Fatigue Endurance Limit designs ✓
- Contact should be maintained with US colleagues to support his investigation ✓
- A comparison of local products with USA materials proven on their major highways should be undertaken ✓
- AAPA should work with SRA / ARRB / consulting fraternity, to Modify the Australian design methods ✓


Asphalt Pavement Solutions – for Life



USA – Warm Mix

Observations

- WMA is being used to provide improved quality of asphalt on many projects in the USA.
- Road Agencies that have used WMA with road projects support WMA.
- TSR and Wheel Tracking laboratory results shown some sensitivity to WMA, which is not supported in the field.





USA – Warm Mix

Recommendations

- WMA implementation be pursued in Australia. ✓
- Acknowledge and confirm that lab mix provides lower results in some lab tests. ✓
- Confirm field performance of WMA is same as HMA. ✓
- Redesign for WMA is not required although some additional work is required. ✓
- Using USA information will minimize time and cost. ✓



Warm Mix Validation Project






AAPA/Austrroads Warm Mix Validation Project


- Partnership between AAPA and Austrroads to prove the hypothesis that warm mix and hot mix perform the same in service.
- Test protocol developed jointly by AAPA & State Road Authorities.
- Test site provided by VicRoads.
- Mixes provided by Downer, Fulton Hogan and Boral.
- Testing monitored and final reports prepared by ARRB





USA – Warm Mix



East Entrance Road to Yellowstone National Park in Wyoming paved in August 2007 using warm-mix asphalt.







USA – RAP

Observations



- Using RAP reduces the cost as well as materials.
- RAP can be used without compromising quality.
- There is scope to reconsider the criteria used to set maximum RAP limits used in mixes.
- RAP is considered a valuable material by most asphalt contractors.
- The USA goal - 25% RAP on average in all mixes by 2013.

USA – RAP

In Australia Today

- RAP is widely accepted although some states do not allow RAP in surface layers
- RAP is now recognized as a resource and is being managed accordingly
- During 2012, 35% of asphalt contained some RAP
 - **During 2012 RAP made up 6% of asphalt produced and over 30% of asphalt contained some RAP**

South Africa– Key Issues

2011 Study Tour to South Africa

Two issues relating directly to Sustainability

- **Activities are to improve pavement performance**
- **Activities to directly support sustainability**




South Africa – Improving Pavement Performance

Observations

- Funding of pavement maintenance is ring-fenced and locked-down in funding allocations
- Pavement and asset management has been developed through measuring, predicting performance and managing expenditure on business driven Key Results Areas (KRA's)




South Africa – Improving Pavement Performance

Recommendations

- Promote road network asset management on commercial lines to provide service to the road user.
- Encourage the use of the performance data to allocate funds reserved for asset preservation and maintenance.
- Promote linking long term pavement performance being linked to accelerated pavement testing and the advantages it has to asset & budgetary management.

These are all issues very relevant to our members, including Government members and others such as Roads Australia.




South Africa – Improving Pavement Performance

Recommendations (cont'd)

- Promote the beneficial materials, pavement structures and management systems.
 - Non-standard certification of "fit-for-purpose" products ✓
 - High Modulus Asphalt ✓
 - Ultra Thin Friction Course proprietary / certified products ✓
 - Warm Mix Asphalt ✓
 - Lower binder content bitumen stabilized materials ✓
 - High density granular bases ✓

These are all technologies being investigated in Australia to build a more sustainable industry.




South Africa – Sustainability

Observations

- The road is a reusable materials bank 
- Introducing Warm Mix Asphalt and other innovative technologies has been achieved






South Africa – Sustainability

Recommendations

- Promote the sustainability concept of the "road materials bank" where materials in the road network are sustainably managed and reused. ✓
- Identify and share carbon reduction strategies for road surfacing and asphalt manufacturing in Australia. ✓

**RAP is a 100% recyclable resource.
Information across Australia is shared**

Europe – Key Issues

2012 Study Tour to Europe

Four major topics were raised each with significant sustainability aspects.

- Long life pavements
- High performance asphalt & binders
- Sustainability
- Procurement systems





Europe – Long life pavements

Recommendations

- Australia would benefit from the use of strain levels in the design of flexible pavements
- The best source of information to calibrate local models would be the performance of existing pavements

Support for perpetual pavements (again).


Validate performance, don't start long research projects if it is proven locally, interstate or overseas



Europe – High performance asphalt & binders

Recommendations

- High performance means longer life and less material used in maintenance.
- The use of EME should be reviewed, being a dense graded, hard bitumen.



Europe – Sustainability

Recommendations


- Sustainable development offers opportunities and is not a threat.
- The benefits of high percentages of RAP should be promoted.
- Waste products added to asphalt must not reduce quality or the ability to recycle.
- Durability should be sought through high quality production and paving.



Europe – Procurement systems


Recommendations

- Promote methods of establishing a national system to support innovation in cost reducing road products and systems and their commercialisation.
- Support and motivate for the transfer to functional specifications and contracts.
- Monitor Australian and other greenhouse gas calculators in to assess their value in comparing industry products and systems.




Carbon and other emissions

- It is common for people talking about the environment to focus on greenhouse gas emissions and climate change.
- We shouldn't only focus on greenhouse gas.
- We have a very low greenhouse product, asphalt and it is 100% recyclable.
- we should ensure everyone in our community knows that




Carbon Calculators

- We must ensure that competitors do not use a calculator to further their products
- For example: the manufacture of HMA requires energy while products such as concrete do not
- However cement requires many times as much energy to produce than bitumen
- Replacement of a concrete pavement also uses significantly more energy and materials than resurfacing an asphalt pavement



Carbon Calculators

- Carbon Gauge and INVEST
- Carbon Gauge is a calculator developed by VicRoads and now accepted by most other State Road Authorities
- It is a high level calculator designed to compare projects, not products
- INVEST is a calculator being used by VicRoads to determine sustainability factors that may be applied to contract prices



Sustainability

Conclusion

Asphalt is a low greenhouse, sustainable road surface but we can do even better.

We can all learn from the experience of others from around the world.

By constantly seeking innovation our industry is a very sustainable industry

- **Environmentally sustainable**
- **Economically sustainable**

A great industry to work in

