

Transport and Main Roads

## Key Findings and Outcomes from the Asphalt Harmonisation Project

Peter Evans – Deputy Chief Engineer (Pavements, Materials and Geotechnical) Transport and Main Roads

Andrew Cramp – ICDCS Program Director Hyder Consulting

Presented at 15<sup>th</sup> AAPA International Pavements Conference – Brisbane 23-25 September 2013

Connecting Queensland  
www.tmr.qld.gov.au

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) Hyder Queensland Government

Transport and Main Roads Hyder

## Why Change? TMR Drivers

- TMR 2012 Restructure – from 82 laboratory staff to 36
- Unable to resource asphalt mix designs
- Government requirement to be enabler rather than doer
- Desire to improve asphalt quality and reduce costs
- Desire for longer defects liability period than 90 days.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 2

Transport and Main Roads Hyder

## AAPA Drivers

- Concerns that TMR specification was “too tight” and difficult to meet
- Desire for more freedom in mix design
- Desire to adopt industry best practice
- Desire to reduce costs to improve viability of industry

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS)

Transport and Main Roads Hyder

## The Journey begins

- TMR explored options with AAPA
- AAPA Chairman suggested that TMR assess the RMS system
- TMR staff visited NSW, and spoke to RMS staff and asphalt suppliers.
- Conclusion - RMS system attractive and worthy of investigation.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 4

Transport and Main Roads Hyder

## Advantages for TMR

- Higher compaction standards, with less permeability and interconnected voids – less rutting
- No requirement for intermediate sealing layer
- 12 month defect liability, and 24 months warranty
- Staff not involved in mix designs.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 5

Transport and Main Roads Hyder

## Approach from Hyder

- Hyder keen to assist TMR with some projects to save costs
- Project agreed as “review of harmonisation with RMS on asphalt procurement”
- One of several ICDCS projects

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 6

Transport and Main Roads Hyder

## What is ICDCS?

**Independent** – exemption from reliance on, or control by others

**Catalyst** – someone that encourages progress or change; creates a reaction without being consumed in the process

**Differential** – making a distinctive difference

**Cost Savings** – through innovation, revised TPSGs or cost avoidance

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 7

Transport and Main Roads Hyder

## ICDCS Project 3.1 – Asphalt Procurement

<b>Hyder Catalyst</b> Greg Wright Principal Engineer	<b>Description</b> Prepare a business case & identify benefits, limitations and risks associated with DTMR adopting RMS's asphalt procurement model. Technical comparison of QLD & NSW test methods. Comparison of IMU and HEA mix designs & insitu AC.
<b>DTMR Project Lead</b> Peter Evans DCE Pavements, Materials & Geotechnical	
<b>Cost Savings</b> NSW typically 10% less. More than \$20m (estimated) over three years.	Ownership of mix design passes from DTMR to supplier Reduced pavement permeability Harmonisation between QLD & NSW specifications
<b>Key Elements</b> Agreement with AAPAQ by June 2013	<ol style="list-style-type: none"> <li>1. Extended warranty on asphalt (90days -&gt; up to 2 yrs)</li> <li>2. Incentives/penalties for increased compaction</li> <li>3. Paving efficiencies through removal of waterproofing seal</li> </ol>

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 8

Transport and Main Roads Hyder

## Approach

- Hyder compared the RMS system with the TMR system, and prepared a comprehensive report
- Hyder presented the findings in July at a workshop with TMR and AAPA

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 9

Transport and Main Roads Hyder

## Major findings

- RMS does not register asphalt manufacturers
- The asphalt manufacturer certifies the design mix conforms to specification
- The principal considers and approves the nominated mix design
- Asphalt pavers must be prequalified to class A
- Pavers must warrant their work from the date the work is completed for the period stipulated in the contract.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 10

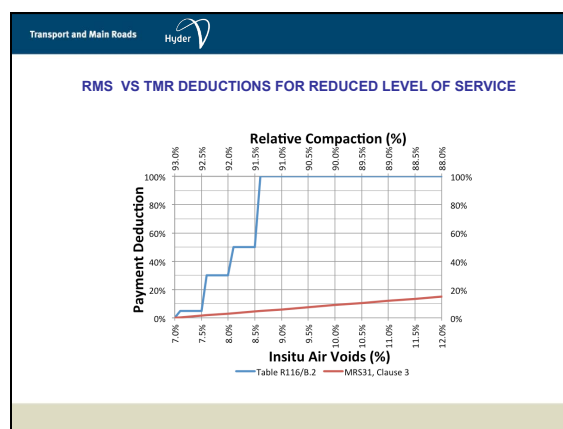
Transport and Main Roads Hyder


## Essential differences with RMS

RMS asphalt specification:

- Has higher compaction standards than TMR
- Has higher penalties for non compliance with voids
- Has higher minimum binder content
- Allows RAP in surface layers
- Does not require waterproofing intermediate seal

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 11




Transport and Main Roads 

### Differences (cont)

- TMR allows pre-treatment of combined fillers with lime, prior to wet/dry strength testing.
- This addresses plastic fines in basalt quarries, and allows 50% of Qld registered quarries to supply for asphalt
- RMS does not allow pre-treatment.


INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 13

Transport and Main Roads 

### Differences (cont)


- RMS uses Class 450 binder – to address rutting through higher binder contents
- TMR uses more polymer modified binders.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 14

Transport and Main Roads 


### Possible Project Outcomes

- Alignment of DTMR procedures with current resource constraints
- Increase in Defects Liability period from 90 days to 12 months
- Introduction of 24 month warranty period
- Lower insitu air void content of dense graded asphalt
- A sustainable improvement in the quality and durability of asphalt paving
- A sustainable reduction in the cost of maintaining the asphalt pavements
- Possible deletion of the waterproof seal below DGA wearing courses
- A first step to future opening up of the asphalt supply markets, as the harmonisation agenda progresses.

Transport and Main Roads 


### Possible Project Outcomes (cont'd)

- Possible use of lower cost binders than the polymer modified binders currently routinely used in Queensland.
- Increased ability to use warm mix asphalt
- Increased ability to use Recycled Asphalt
- Improved savings through consistent testing methods between states – as harmonisation agenda is adopted by other states
- Opening up of the asphalt supply markets as harmonisation progresses.

Transport and Main Roads 

### Possible risks

- Suppliers may charge for warranty.
- Higher binder content may lead to rutting if Class 450 binder is not adopted
- Some asphalt companies may not make the change and withdraw from Queensland
- Others may delay implementation

Transport and Main Roads 

### Possible risks (cont)

- Costs could increase if less competition in market
- Savings may not be realised
- Continuing to pre-treat with lime to allow basalts may compromise durability.

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 15

Transport and Main Roads Hyder

DTMR's Volumetric Mix Design Criteria:

Organisation	DTMR
Specification	MRTS31A
Mix Description	DG14HP
Binder Type	A5S
Effective Binder Content	≥ 10% by volume
Sample Preparation	Q305 (50 blows)
Air Voids in Design Mix	3.5% to 4.5%
VMA in Design Mix	13% to 17%
VBF in Design Mix	63% to 83%

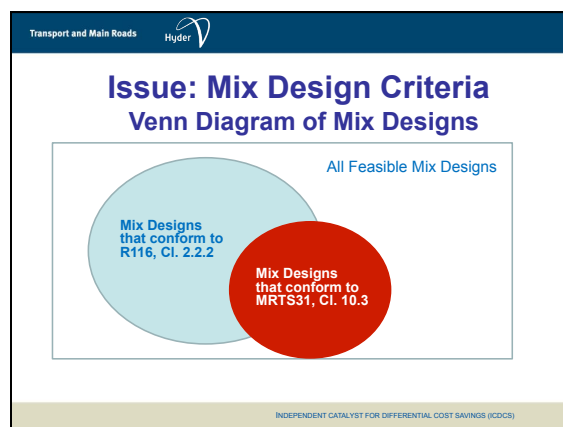
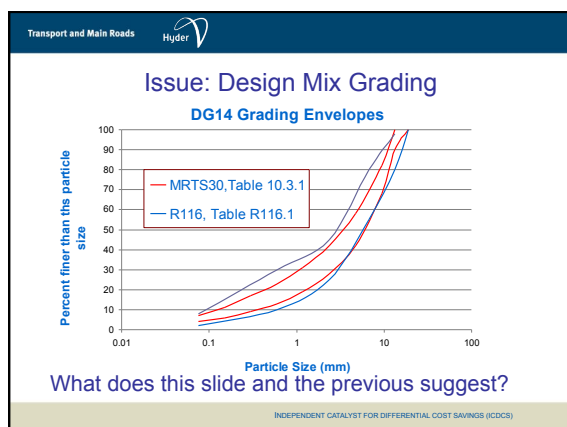
Let's compare the above volumetric criteria with RMS's

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS)

Transport and Main Roads Hyder

Organisation	DTMR	RMS
Specification	MRTS31A	R116
Mix Description	DG14HP	AC14 Binder Course
Binder Type	A5S	AR450
Binder Content	≥ 10% by volume	4.8% to 6.2% by mass
Sample Preparation	Q305 (50 blows)	T662 (120 cycles)
Air Voids in Design Mix	3.5% to 4.5%	3.0% to 6.0%
VMA in Design Mix	13% to 17%	≥ 15%
VBF in Design Mix	63% to 83%	Not specified
Binder Film Index	Not specified	≥ 7.5µm
Filler to Binder Ratio	Not specified	0.8 to 1.2

INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS)



- Transport and Main Roads Hyder
- ### Outcomes
- Hyder presented findings at workshop with TMR E&T and Regional staff, and AAPA Managers and Technical staff
  - TMR and AAPA have agreed to progress harmonisation
  - RMS specification to be default unless sound technical reasons to change
  - Target is draft specification by end 2013.
- INDEPENDENT CATALYST FOR DIFFERENTIAL COST SAVINGS (ICDCS) 23