## ENGINEERS AUSTRALIA

**WELCOME!!!**

**"Use of toxic materials in QLD Pavements"**



Presenters
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## Outline

- Vision "Toward Zero Waste"
- Types of waste materials that can be recycled
- Environmental issues "The facts on used tyres in Australia"
- Advantages of tyre recycling.
- Worlds best practice tyre rubber in road pavements (USA, Brazil, Germany, China, Spain).
- Process
- Current situation in Australia & Queensland with use of recycled materials in road pavements.

## Types of waste materials that can be recycled into pavements

- Building rubble
- Tyres
- Waste from power plants

## TOWARD ZERO WASTE

- "Zero Waste is a goal, a process, a way of thinking that profoundly changes our approach to resources and production. Not only is Zero Waste about recycling and diverting materials from landfills, but it is also about restructuring production and distribution systems to prevent waste from being produced in the first place."

http://www.brisbane.qld.gov.au/environment-waste/rubbish-tips-and-bins/recycling-reducing-waste/towards-zero-waste/index.htm

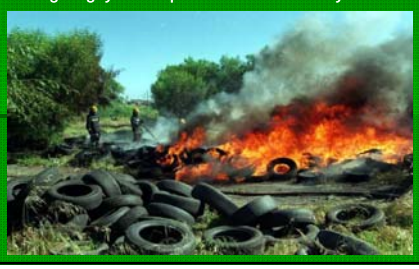
## The issues

- About 20 Million tyres sold in Australia per year.
- 57% goes to land fill
- 13% inappropriate disposal
- 30% burned for energy in cement kilns and tyre derived products including rubber crumb

- "Issues associated with waste tyres have exercised the minds of both government policy makers and sections of the tyre industry around the world for many years. Yet there remains a strong perception that waste tyres are not being managed as well as they might. A majority of waste tyres are disposed to landfill, and there are reportedly significant numbers that are dumped illegally or managed in other inappropriate ways. Whatever the environmental risks, such practices fail to extract any value from waste tyres". *A National Approach to Waste Tyres* (Atech Group).
- Waste tyres can also provide breeding grounds for mosquitoes and vermin.

## Issues

- By far the greatest environmental threats come from uncontrolled burning
- The runoff from fighting tyre fires pollutes local waterways and soil.



## Advantages of tyre recycling into pavements.

- Treating the tyres as a resource
- Can reduce the capital costs by up to 20%
- Can reduce noise by up to 25%
- Reduce dependency on need to extract virgin material

## Advantages of tyre recycling into pavements.

- The pavement will last longer
- Reduced maintenance costs of pavement
- Tyres when used in Modified Binders are have shown great engineering properties. Don't crack in cold or melt in heat.

## Worlds best practice tyre rubber in road pavements

- Developed in 1960's by City of Phoenix Engineer USA


## The process of tyre recycling


## Australia

**Spray Sealing**

**1975 …….**

- **VicRoads / ARRB jointly began experiments using scrap rubber in bitumen**
- **Developed methods of incorporating the rubber into bitumen, and spraying it using conventional spraying equipment**
- **First recorded trial of crumb rubber seal - Princes Highway, Hallam, VIC in December 1975**

**(QLD Government 2009-Strategic Alliance Ref Group, SAMI)**

## QLD

- **Only about 2%of all PMB sprayed will be crumb rubber**

**(QLD Government 2009-Strategic Alliance Ref Group, SAMI)**

## Engineering advantages of rubber within PMB

- Improve aggregate retention
- Minimise or delay reflective cracking
- Minimise risk of bleeding
- Reduce water penetration
- Improve shear resistance in high traffic situations
- Reduce temperature dependence of properties
- Allow early brooming of seals
- Extend the life of seals

(QLD Government 2009-Strategic Alliance Ref Group SAMI)

(QLD Government 2009-Strategic Alliance Ref Group)

About 3 months later

Reseal over cracking and road widening

## In summary: Crumb Rubber Sealing Binder

- **High quality binder**
- **Excellent field performance**
- **Good value**
- **No requirement to import polymers**
- **Reduction of scrap tyre stockpiles**
- **Contributing to environmental responsibility**
- **Used extensively throughout NSW & VIC**

**(QLD Government 2009-Strategic Alliance Ref Group, SAMI)**

## THANK YOU !

Questions……

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