

1 Introduction.

This document provides an overview of Greenpave, Australia's first reduced emission asphalt, and its commercial application in Victoria. Its purpose is to ensure Victorians with an interest in reducing the carbon footprint of municipal life are aware of the technology being employed to dramatically reduce the emissions produced in building our roads.

Greenpave is produced by Citywide, a major Melbourne-based company providing open space, civil maintenance and waste management services to local and state governments in Victoria and New South Wales. The product offers a range of environmental, performance and occupational health and safety benefits over traditional hot mix asphalt, the most prominent being the capacity to reduce fumes and greenhouse gas emissions by 30%.

Greenpave is produced at Citywide's North Melbourne Asphalt Plant, designed by Swiss engineers. Incorporating cutting edge pollution control, noise reduction and dust extraction technologies, it is the most environmentally sensitive in the southern hemisphere and also reduces emissions from production by up to 30%.

This briefing forms part of Citywide's communication to elected officials and government leaders in Victoria. It provides a succinct, factual overview of the product and the results of successful trials conducted by municipal governments across metropolitan Melbourne.

2 Context: responding to policy and community expectation.

Among the highest greenhouse gas emitters in the world, Australians have an obligation to find and use products and services that are energy efficient.

The City of Melbourne recently conducted the largest community consultation project ever attempted in the history of capital government. Highly successful, *Future Melbourne* won the Australian Institute of Planning President's Award. It was informed by thousands of community members who had a core message: the city must become an eco-city.

"An eco-city reduces its ecological footprint to fit within the boundaries of one planet. In an eco-city, people and organisations adapt to a changing climate and gladly act to build a sustainable future."

A growing number of Australian councils are setting tough emissions targets. The only way they will reach these targets is by changing the behaviour of business, property owners and residential communities while achieving reductions in every aspect of their own operations.

Reducing waste, energy and carbon emissions is about to make a lot more immediate sense. The Commonwealth Government is focused on implementing a carbon emissions trading scheme (ETS) and a tax on carbon emissions in 2010. Already under pressure, public works in both the private and public sectors will be subject to rapid change. What might the new policy environment mean to the road building industry?

- There will likely be a need to purchase carbon credits to offset CO₂ emissions
- Tougher conditions will be placed on new and existing industrial facilities.
- Contracts with governments and corporate organisations will include specifications relating to carbon emissions.
- Public pressure will continue to escalate.
- Risk to reputation will increase for governments and companies that do not genuinely attempt to reengineer for sustainability.

3 Predicting and adapting to change.

Citywide predicted scientific evidence and community opinion would drive policy change in response to climate change. A producer of asphalt and provider of road maintenance services,

the company investigated energy use and the level of emissions produced along its supply chain with the aim of reducing its carbon footprint and that of its customers.

In February 2008, Citywide opened the doors of its high tech, redeveloped North Melbourne asphalt plant. It produces a suite of asphalt products including standard hot mix, Recycled Asphalt Product (RAP) and Australia's first low emission asphalt, Greenpave.

Citywide Greenpave is produced using Shell Bitumen technology, tested on European roads since 1995. Commonly known as warm asphalt mix or 'WAM' it is produced at significantly lower temperatures than standard asphalt mixes. The new formula offers safety and environmental benefits with performance standards at or above those currently met in the Australian market.

With Greenpave, Citywide responds directly to the huge groundswell of community and government concerns over climate change. It offers the Victorian market an asphalt product that is safer and has significantly less environmental impact than standard mixes.

As our automobiles become greener, so too can our roads.

3.1 Proven technology.

The conventional hot mix asphalt production process uses one grade of bitumen at approximately 170°C whereas the Greenpave process (Fig. 1) uses two binders at significantly lower temperatures (~110°C). Combined application of the binders results in higher performance bitumen.

Unlike hot mix which is susceptible to weather conditions, Greenpave offers greater workability and therefore a longer construction season. It is subject to less oxidative hardening of binder leading to better fatigue performance over time, and layers can be paved thicker offering:

- greater productivity;
- operational savings; and
- a rapid return to traffic.

3.2 Environmental outcomes.

Traditional asphalt mixes for road making are heated to 160°C-170°C for fluidity and workability. Greenpave is manufactured at only 110°C-120°C. The temperature reduction of up to 60°C leads to substantial environmental benefits when compared with standard mix asphalt (tested by Shell):

- Up to 30% less fume emissions during production.
- Up to 30% less greenhouse gases.
- Up to 55% less fine dust.
- Energy savings of up to 30%.

The most recent facility data indicates savings of over 20 kilograms per truck load of asphalt. That's 4400 black balloons.

3.3 Reduced risk to people.

The reduction in production temperatures and fumes corresponds with immediate safety benefits to workers and community members, because employee exposure to heat and fumes is reduced, and fumes and emissions are reduced in inner city communities (*see Fig. 3 for a visual depiction*).

Improving the workplace improves the outcome. A low heat, low emission and low fumes product is an important leap forward in improving safety as well as general workplace conditions. It enhances the perception of the role and supports efforts to improve productivity.

In addition, as any council officer knows, general perceptions of safety are extremely important to the attractiveness of a municipality as a place in which to live and work. Air pollution is an area of

considerable community concern. Local government and the development industry need to demonstrate progress by improving safety and pollution reduction outcomes.

Visual observation of emissions during production of WAM



4 Greenpave across Victoria. 12 month report.

In just 12 months, Greenpave has been laid at 20 sites across metropolitan Melbourne.

Seven councils (Melbourne, Boroondara, Wyndham, Moreland, Yarra, Manningham and Darebin) have chosen the new product, promoting its use through the local press and council publications. Completed three month trials have passed independent audits across all categories. Community reaction has been positive.

The Victorian state government road authority, VicRoads, is also conducting a trial on the Deer Park bypass, due for completion later this year. The three month audit revealed the Greenpave product s performing at levels equal to, or better, than adjacent road laid with standard hot mix.

5 World class production technology.

On 15 February 2008, Citywide launched its redeveloped North Melbourne Asphalt plant, the most environmentally sensitive facility in the southern hemisphere. The plant reduces greenhouse gas emissions by up to 30%. Designed by world leaders, the Swiss Ammann Group, it incorporates cutting edge pollution control, noise reduction and dust extraction technologies.

The North Melbourne plant is the city's most centrally located, just minutes from the CBD. In addition to technologically driven benefits, the short transport routes needed to supply asphalt reduce the time trucks are on the road. The outcome: less emissions and congestion.

Quick facts: environmental benefits of the new plant.

The new plant meets European environmental standards which are twice as tough as Australia's. Here are some of the benefits to Victoria:

- Gas and electricity consumption is reduced by up to 30%.
- Noise is reduced through fully silenced burner and frequency converters systems.
- Odour is virtually eliminated through a post combustion fume control system and use of odour filters on bitumen kettles.

- Dust control is best practice due to full insulation of plant components.
- Site drainage has been improved to reduce storm water contamination.
- Old asphalt can be recycled into new mix.

6 Citywide: shaping sustainable landscapes.

Citywide is a diverse company shaping and maintaining high performance assets. The company delivers the full scope of environmental and civil infrastructure services, supported with expert advice, to government and private enterprise. Citywide has a strong reputation for service innovation and the quality of its work. The company is a trusted partner in the growth and development of sustainable urban communities and customer businesses.

6.1 Achievements in environmental sustainability

Citywide has a strong track record of research, development and adoption of environmental technology. The company produces an annual sustainability report which outlines progress against agreed targets in the areas of workplace, environment and social responsibility.

Industry leadership has been demonstrated by development and adoption of new technology:

- North Melbourne Asphalt Plant - the most environmentally sustainable asphalt plant in the Southern Hemisphere
- Greenpave – Australia's first low emission asphalt (produced for the Victorian market) currently undergoing VicRoads trial
- Cardboard and paper recycling and bailing facility
- Community Biopower Centre (alternative waste treatment facility planned for Dynon Road, North Melbourne)
- Recycled Asphalt Product (RAP) – one of Victoria's early producers
- Compressed Natural Gas (CNG) – first company in Victoria to use CNG in waste collection vehicles
- Trialling the use of dual fuel LPG, achieving a significant reduction in carbon emissions of 14% and a 12% reduction in NO_x (a toxic pollutant).
- Air powered vehicle research project (2004)
- Water efficient garden management strategies for local governments
- Bushland and foreshore regeneration (Bayside and Port Phillip)

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