

Smoothness Matters

The US Asphalt Pavement Alliance has released a publication "Smoothness Matters".

This emphasizes the importance of well maintained flexible pavements to save costs for the community and reduce emissions to the environment. It is therefore as relevant to Australia as it is to the US

The US Asphalt Pavement Alliance (ACA) publication "Smoothness Matters" comments that pavement smoothness is a significant determinant of vehicle fuel economy. That is, the smoother the pavement, the lower a vehicle's fuel consumption. This is as pavement smoothness affects the rolling resistance by influencing friction between the tyre and the pavement.

This makes common sense – the less rolling resistance, the less energy necessary to drive a vehicle along the pavement. However, how much difference can the pavement smoothness make to fuel consumption?

The ACA report that the most thorough investigation of this issue was a full-scale field study conducted by the Federal Highway Administration at the WesTrack pavement test track in Nevada. This study indicated that trucks running on slightly smoother pavement could reduce fuel consumption by 4.5 percent. Other studies show similar or sometimes greater fuel savings with cars running on smoother pavements.

Studies also show that the savings are even greater when one compares the roughest pavements in a highway network with the smoothest. Some experts estimate that it is possible to reduce fuel consumption by as much as 10 percent by rehabilitating the roughest pavements.

Not only do smoother pavements reduce fuel consumption, they also reduce vehicle operating costs and driver fatigue by minimizing tyre bounce and load impacts. According to figures developed by the US Road Information Program (TRIP), driving on rough roads costs the US motorists \$23 billion annually in extra vehicle operating costs.

Smoother pavements also last longer as truck tyres roll along the pavement instead of bouncing on each bump. Even small bumps, accelerate the rate of road deterioration. Studies in the US show that improving pavement smoothness by 25 percent results in almost a 10 percent increase in pavement longevity. This saves taxpayers money and conserve natural resources.

For all these reasons, the ACA claim, smoothness matters.

Keeping a road smooth begins with a well-engineered foundation and pavement structure. An asphalt "perpetual pavement" is designed and built to ensure that the structure lasts virtually indefinitely. Routine maintenance is simply a matter of infrequently milling the surface for recycling, followed by placing a smooth new asphalt overlay, a task that can be done quickly with short road or lane closures and little impact on traffic.

In the US it has been determined asphalt pavements are easier to keep smooth. It has also been determined that if the roads across the US could be made slightly smoother there would be a saving of at least 4 percent of the fuel consumed. This would reduce annual vehicle fuel consumption by about 7 billion gallons, equivalent to taking over 10 million vehicles off the road every year. It would also reduce the amount of fuel and vehicle maintenance required for every traveller on US roads, in addition to conserving natural resources and benefiting the whole environment.

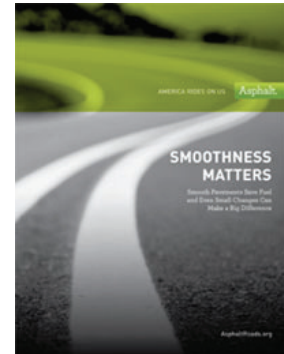
While we don't use as much fuel as the US, smoother roads in Australia could also have a significant impact on fuel consumption in this country. The use of asphalt pavements is the most effective means of achieving and maintaining smooth roads. Asphalt surfaces can also be made to meet a range of requirements such as low noise, skid resistance and to minimise water spray and can be readily maintained at low cost and minimal disruption.

The smoother the pavement, the less fuel consumed. The less fuel consumed, the less costs to the community and the less impact on the environment

The ACA document can be downloaded in full from <http://asphaltroads.org>.

For a full discussion of studies on this topic,

Marks, Howard, PhD. 2009. Smoothness Matters: The Influence of Pavement on Fuel Consumption. Hot Mix Asphalt Technology Vol. 14, No. 6, pp. 18-29, available at www.nxtbook.com/nxtbooks/naylor/NAPS0609/index.php#/18.



The US Asphalt Pavement Alliance is a joint venture between the US National Asphalt Pavement Association (NAPA, the US Bitumen Institute and US State Asphalt Pavement Associations.(APA) has just released a new publication highlighting the benefits of asphalt pavement, lower fuel consumption.