



Hawaii State Senate
Ways and Means Committee

February 24, 2011

Subject: Support for SB 698, Relating to Roadway Materials
Hearing Scheduled for 9:00 AM Friday, February 54, 2011, Conference Room 211

I am writing today in support of **SB 698**.

Currently, HRS 103D-407 requires State highway officials to purchase roadway materials with minimum recycled glass content of 10% for basecourse and 100% for nonstructural capital improvement applications. This requirement (sometimes referred to as the "glassphalt mandate") has the following negative impacts:

1. It reduces the quality of roads in Hawaii.
2. It impairs the paving industry's ability to recycle asphalt pavements.
3. It results in a higher carbon footprint than if glass were shipped to the mainland to be recycled into new glass products.

The proposed bill **SB 698** would end the *requirement* that State agencies must use recycled glass in roadway materials, but would still *allow* State agencies to use recycled glass if desired. The following is a brief explanation of each of the negative impacts listed above.

1. Glass reduces the quality of roads in Hawaii.

Quite simply, asphalt does not stick to glass. The smooth surfaces of glass result in a higher stripping potential than natural aggregates, which causes the asphalt to "strip" from the aggregate, thereby causing premature failure. Glass can also reduce the skid resistance of the road, which is unsafe for drivers. For these reasons, glassphalt is not used in surface courses.

2. Glass impairs the paving industry's ability to recycle asphalt pavements.

Reclaimed asphalt pavement (RAP) is one of the most recycled materials in Hawaii, and throughout the country. It can be recycled into unbound aggregate basecourse, as well as new hot-mix asphalt pavements. Adding RAP to new hot-mix asphalt is considered the *highest and best use* since both the aggregate *and* the liquid asphalt are utilized in the new pavement. Unlike glass, RAP is used in the surface course (up to 20%) as well as the basecourse (up to 40%). In 2010, more than 50,000 tons of RAP were used in hot-mix asphalt produced by Grace Pacific.

The presence of glass in the asphalt treated basecourse makes it difficult to use RAP in surface pavements. When existing roads are resurfaced or reconstructed, RAP from the surface course and the basecourse are comingled during the milling process. RAP is then brought to a facility for processing prior to recycling back into new hot-mix asphalt. Due to the limited space availability for stockpiling RAP, it is difficult – and sometimes impossible – to separate RAP that has glass in it with RAP that does not.

RAP that has glass in it may not be used in surface pavements. The asphalt paving industry has seen a complete lack of cooperation from State and County highway agencies with regards to allowing even an incidental amount of glass in the surface course (i.e., less than 1%). Thus, the presence of glass in the asphalt treated basecourse impairs the paving industry's ability to recycle asphalt pavements.

3. Using glass in roadway materials results in a higher carbon footprint than if glass were shipped to the mainland to be recycled into new glass products.

The process of manufacturing virgin glass from silica sand is extremely energy intensive. Adding recycled glass to the manufacturing process significantly reduces the amount of energy required to produce glass products.

I have done a simple life-cycle carbon footprint analysis of glass recycling that includes the carbon savings associated with recycling glass, as well as the carbon emissions associated with shipping glass to the mainland for recycling. For this analysis, I assumed a shipping distance from Honolulu to Los Angeles of 2,550 miles, and a trucking distance from Los Angeles to a glass recycler of 100 miles. Using these assumptions, *each 20-ton shipping container sent to the mainland for recycling results in a net decrease of CO₂ emissions by 3.6 tons.*

In contrast, adding 20 tons of glass to hot-mix asphalt basecourse would result in a net decrease of CO₂ emissions by 0.4 tons. In other words, *the CO₂ emissions reduction associated with shipping glass to the mainland for recycling is 10 times greater than the CO₂ emissions reduction associated with adding glass to asphalt pavement.*

In summary, **SB 698** will allow for better quality roads, enable more cost-effective recycling of asphalt pavements, and reduce Hawaii's overall greenhouse gas emissions. I strongly support this bill.

Please do not hesitate to contact me at 674-8383 if there are any questions regarding this testimony.

With regards,

Joseph Shacat
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