Rubberized Asphalt Concrete

Rubber from scrapped tires can be repurposed to resurface roads.

The Impact

Rubberized asphalt concrete roads present a sustainable solution to creating higher performance and more durable roads. They also divert discarded tires destined for landfills or illegal dumps.

Description

Rubberized asphalt concrete (RAC) is made by mixing crumb rubber (ground-up, recycled tires from which contaminants such as dust and rock are removed) with asphalt. There are two primary binders associated with RAC: asphalt rubber (a blend of paving grade asphalt cement that has been successfully used for three decades in California) and terminal blend (a binder blended with finer crumb rubber that has been successfully used in California for two decades).

RAC binders are often applied at a reduced thickness compared with traditionally paved roads, which results in them being more cost effective. Moreover, RAC roads are more resistant to cracking, offer better sound dampening capabilities, retain their color for longer periods of time and can improve the traction of vehicles on the road.

As an added bonus, RAC roads can last up to 50 percent longer than traditionally paved roads and have added flexibility due to the rubber composite added to the mix.

Where It's Been Implemented

Rubberized asphalt concrete (RAC) roads have been used in California for three decades. By the end of 2010, 31 percent of all hot mix asphalt roads paved by Caltrans used rubberized hot mix asphalt. Asphalt rubber roads have been used by the Sacramento County Department of Transportation since 1990. In total, the Sacramento agency has recycled more than 1.5 million waste

tires. Complete lists spanning hundreds of RAC projects over the last decades can be found on the Caltrans website under “Rubberized Asphalt Concrete.”

Key Drivers

Nearly one quarter of scrap tires end up in landfills. By 1994, in stockpiles alone, there were an estimated 700 to 800 million scrap tires in the U.S. Since then, removal and cleaning efforts have reduced that number to around 275 million tires in 2004.

A single 2-inch-thick RAC resurfacing project uses around 2,000 scrap tires per lane mile, and in recent years 10 million waste tires have been used in RAC paving projects around California.

Another factor to consider when considering the use of RAC is the durability and longevity of traditional asphalt roads. A conventionally paved road lasts an average of 10 to15 years and, when repaved, has a significant carbon impact, whereas RAC roads last about 50% longer. According to a study in the International Journal of Sustainable Transportation, better paved roads could save drivers 2 to 5 percent in fuel, tire wear, and repair and maintenance costs, thus lowering carbon impacts even more.

Key Factors for Success

In order for the RAC to have widespread success, cities or businesses need to be willing to implement this paving method in their community. Education on the benefits of implementing RAC projects and assistance with the technical aspects of construction will help those hoping to install RAC projects. In California, many resources are already provided by CalRecycle, such as grant opportunities and educational materials.

Key Obstacles

Given that the mix needs to settle in warmer climates, RAC installations run into some complications in areas of high altitude or areas with colder temperatures. The main obstacles to RAC’s increased usage are lack of information regarding its benefits and insufficient funding. CalRecycle has sought to address both of these concerns by publishing guides for technical installation and education concerning RAC projects and providing financial aid through grants for those seeking out RAC technology.

References and Resources

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Document last updated April 2023