New Foot-Friendly Pavement for Jogging Trails Recycles Tires

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A new material for paving recreation trails holds potential for the large-scale recycling of rubber from automotive tires, as well as for cushioning the activities of joggers, walkers, and bicyclers. And it's less expensive than other rubberized paving materials currently on the market.

"Some 290 million scrap tires are generated in the United States annually. That's literally mountains of tires," says Dr. Robert C. Amme, professor of physics and materials science and manager of the Environmental Materials Laboratory at the University of Denver.

"Our motivation was to find new ways to recycle (these tires). This paving material appears to present a potentially major means of doing that. The process consumes rubber from about 6,000 to 7,000 tires per mile of trail."

The rubberized pavement for exercise trails and paths has been developed through extensive laboratory study and multiple field tests using varying compositions. The work was done by Dr. Amme, his graduate student Haifeng Ni, and William E. Meggison of Meggison Enterprises in Brush, Colo.

Their research paper, "Field Testing of Asphalt Rubber/Rubber Aggregate As a Surfacing Material for Recreational Trails," will be presented at the Asphalt Rubber 2006 Conference in Palm Springs, Calif., in October. It was previously presented at the 2005 Petersen Asphalt Research Conference in Laramie, Wyo.

Their mixture of asphalt, ground-up tire rubber, and a chemical modifier is softer and more resilient for pedestrian traffic than traditional concrete or asphalt, but firm enough for bicycle riding. It's already drawn some commercial interest. The University of Denver has filed for a patent, which is pending.

"We want to call the material SofTrails," Dr. Amme says.

Most of the paved pedestrian trails in the U.S. are composed of crushed rock bound with traditional asphalt or concrete, and are tough on the feet, ankles, and knees of exercisers, Dr. Amme says.

In contrast, Amme's and Meggison's material uses granulated tire rubber instead of rock. For recreational users, it offers a comfortable, shock-cushioning surface and good traction even when wet. The material is also highly durable and resistant to wear, cracking, water penetration, and ultraviolet radiation.

"Pedestrian trails are becoming more popular all the time, and making them truly comfortable for users is an important concept," says Dr. Amme.

While various rubberized pavements are already currently in commercial use, they're costly because they employ polyurethanes or latex as the binders. Thus are typically applied only to small areas such as tennis courts, oval tracks, and short paths.

The material developed by Amme and Meggison, however, uses less expensive ingredients, making it economical even for long trails and large expanses. "The cost is well below that of outdoor polyurethane and latex products, and is comparable to that of a standard mix of asphalt with crushed rock," says Dr. Amme.

The new rubberized pavement is a unique blend with ground rubber particles as the major component, plus asphalt and a few percent of a chemical modifier called Vestenamer®. Coloring can also be added.

A fine grind of rubber is first mixed with the asphalt to make the binder, which is then blended with a coarser grind of rubber particles and the Vestenamer®. The Vestenamer® helps bond the asphalt/rubber mixture with the rubber aggregate, and reduces the tackiness.

The end result may be spread as a top coat on asphalt or concrete surfaces. It may also be applied to areas without existing pavement, but the ground first would need to be extensively prepared, much the same as if it were going to be paved with conventional asphalt or concrete.

The cushioning and durability are comparable to that of more expensive rubberized surfaces containing polyurethanes or latex, Dr. Amme says. The field tests indicated the material has a lifetime of at least 10 years even in climates with harsh winter weather.

Source: Dick Jones Communications