Cement-like creation could help the environment

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Civil and environmental engineering assistant professor Naji Khoury, left, supervises the installation of six slabs of porous Plastisoil in a walkway outside the College of Engineering. Assisting are two undergraduate engineering students and a contractor, right.

(PhysOrg.com) -- Civil and Environmental Engineering Assistant Professor Naji Khoury has created a permeable cement-like material that offers a host of environmental advantages over traditional paving.

A Temple University researcher has developed a cement-like substance that could help with stormwater management while potentially keeping millions of plastic bottles out of landfills.

Naji Khoury, an assistant professor of civil and environmental

engineering at Temple, uses a mixture of recyclable plastic bottles and soil to create "Plastisoil," a trademarked product he describes as an impervious cementing agent. When mixed with course aggregate and heated, it produces what Khoury calls "porous Plastisoil," which functions like pervious concrete and porous asphalt.

Khoury said that Plastisoil could help alleviate environmental problems created by stormwater run-off because stormwater can filter through it into the ground below. The material could be used to form sidewalks, bike/jogging paths, driveways and parking lots.

"We are currently testing the porous Plastisoil to see if could also remove or reduce pollutants like motor oil from the water as it filters through," he said.

The product has an additional environmental benefit. Since it is made with polyethylene terephthalate (PET) plastic bottles, it will help reduce the 200 billion plastic bottles that are sent to landfills each year. Khoury said that it takes 30,000 of the no. 1 recyclable bottles to make one ton of porous Plastisoil. He hopes to be able to use different types of recyclable plastic bottles in the future.

In addition, Khoury said that an energy analysis shows that it uses less energy to produce one ton of Plastisoil than one ton of cement or asphalt. He added that preliminary results also show porous Plastisoil to be cheaper to manufacture than existing technologies and products.

Khoury first developed Plastisoil with co-inventors while at the University of Oklahoma, but he created the material after moving to Temple in 2008. He is currently doing life-cycle assessment on the product, and a slab of porous Plastisoil has been laid in a walkway outside Temple's College of Engineering Building.

Provided by Temple University