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# Mixed Waste Plastics as Compatibilizers in Asphalt

## Background

Nearly 94% of all public roads in the United States are paved with asphalt, and span over 4 million miles in total. However, asphalt pavement degrades when it is exposed to UV rays and oxidation. Current asphalt pavement is also prone to premature cracking and moisture damage, which both further shorten its service life. As the population continues to grow in the United States and globally, there is a need to increase both performance and lifetime of current asphalt pavements.

## Invention Description

Researchers at Arizona State University (ASU) and National Renewable Energy Laboratory (NREL) have developed novel mixed waste plastics compatibilizers for asphalt. The compatibilizers are formed from waste polyethylene terephthalate (PET) that has been digested by alkylamines. The processing of PET with alkylamines reduces its molecular weight, digests amorphous components, and produces bisalkyl terephthalamides. The resulting mixture can compatibilize polyolefins in bitumen and asphalt mixtures.

## Potential Applications

- Highways, city roads & bicycle paths
- Soil protection
- Water management

## Benefits & Advantages

- Improves performance properties of asphalt at a variety of environmental conditions
- Recovers and repurposes PET waste to create value-added products
- Rutting, fatigue, thermomechanical and creep performance improved by up to 18%

Published Patent Application: [US20220267211A1 - Mixed waste plastics compatibilizers for asphalt - Google Patents](#)

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