
TIP Project Brief – 090114/10H019

Civil Infrastructure

Development of High-Toughness, Low-Viscosity Resin for Reinforcing Pothole Patching Materials

Develop an innovative pothole repair technology for asphalt pavement in both warm and cold weather using an ultra-high toughness, nano-molecular resin as a reinforcement or binder for the asphalt-aggregate pothole repair material.

Sponsor: The Regents of the University of California (UCLA)

Los Angeles, CA

- Project Performance Period: 2/1/2010 - 1/31/2013
- Total project (est.): \$3,051 K
- Requested TIP funds: \$1,499 K

A joint research team led by the University of California at Los Angeles in partnership with Materia, Inc., together with the Department of General Services of the City of Los Angeles as a subcontractor, is developing an innovative pothole repair technology for asphalt pavement in both warm and cold weather. Pothole repair is not a glamorous issue, but it's an important one. The potholes in the asphalt pavement of our country's roadways have become an annoying part of our daily life and no innovative technologies have been advanced sufficiently to improve the safety of US drivers, reduce the traffic congestions and cost of road maintenance, and lower the vehicle damages which are in the range of billions of dollars annually. Thus far, most technical approaches to pothole repair have focused on improving the processing and deployment of the asphalt patches. This project takes a radically different approach, infiltrating the compacted asphalt-aggregate mixture with an ultra-high toughness, nano-molecular resin. After the resin is infiltrated, cured, and hardened, it will form a continuous network of mechanical "cages" that will provide mechanical locking of the aggregates in the asphalt mixture, serve as a load-bearing component under repeated traffic stresses, provide compressive shear-load strength, anchor patches to the original pavement walls and sub-bases, prevent water infusion and serve as barrier for the initiation and propagation of alligator cracks. The project involves several major challenges, including material development, compatibility studies, interfacial chemistry and adhesion, performance evaluation and durability testing, durability modeling and life prediction, deployment, road testing and nondestructive monitoring. The Department of Public Works of the City of Los Angeles and the California Department of Transportation will support the deployment of the new repair materials and technology to street test sites. If the project is successful, it will fundamentally revolutionize the asphalt pavement preservation and pothole patching repair methodology, dramatically enhance the strength, durability and service life of the asphalt pavement and pothole repair patching practices.

For project information:

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Active Project Members

- Materia Inc (Pasadena, CA)
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- The Regents of the University of California, (UCLA) (Los Angeles, CA)
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