Rubber-Modified Asphalt: Paving The Road To The Future

2022

RECYCLED RUBBER COALITION

Executive Summary

Every year almost **300 million scrap tires** are generated in the United States.

Crumb rubber, rubber obtained from scrap tires, can be combined with traditional asphalt materials to produce **rubber-modified asphalt (RMA),** which has a host of benefits compared to traditional asphalt mixtures.

Some **benefits of RMA** include increased longevity, pavement noise reduction, increased safety, lifetime cost savings, and environmental benefits.

As the U.S. makes a major investment in infrastructure, it is critical that the investment provides **sustainable, long-lasting results** for the American people.

States And Local Governments Are Facing Competing Priorities When It Comes To Roads And Highways

Traffic noise linked to higher risk of heart attack, study says

WRAL.com

DOT Secretary Pete Buttigieg on Wednesday said flatly that states are still able to spend their federal infrastructure dollars on highway expansions, despite a Federal Highway Administration memo saying states should prioritize fixing existing assets first.

POLITICOPRO

Colorado enacts new rules to reduce greenhouse gas emissions with fewer road expansions, more mass transit options

The Denver Post

The bipartisan infrastructure law is both historic and not nearly enough

Vox

The application of proven technologies like **RMA can help states and localities solve a variety of challenges**, while also **reducing costs** in order to help make infrastructure dollars go even further.

These benefits come as the application of **RMA also helps divert thousands of scrap tires from landfills and illegal dump sites**, creating a cleaner environment overall.

Recycled Rubber Is Rubber, And Using Recycled Rubber To Make RMA Has Been Happening For Decades

Rubber products are made to last, and in many cases, that's a good thing. But when it's time for an upgrade, rubber products can be difficult to dispose of responsibly. That's where recycled rubber comes in.

Recycled rubber is produced from end-of-life tires (ELTs) through a straightforward process:

Crumb rubber can then be added to asphalt mixtures to produce RMA.

- Materials like fiber and wire are moved and the rubber is cleaned and ground up.
- At no point in the process does the rubber undergo any chemical change; recycled rubber is rubber.

- RMA has a number of benefits compared to traditional asphalts such as increased cracking resistance, reduced tire abrasion, and a decreased carbon footprint.

RMA has been used in the U.S. since 1965 but has not achieved broad adoption compared to traditional mixes.

RMA Is A Growing Market For End-Of-Life Tires And Contributes To A Circular Economy

The Issue	The Cause	A Solution
The United States generates around 300 million tires each year.	USTMA finds the slowdown is the result of limited efforts by industries and the government to research new uses for scrap tires.	With the Bipartisan Infrastructure Law going into effect, the market for RMA can grow significantly.
In 2013, the U.S. peaked in tire recycling, with around 96% of tires going into secondary use; however, recycling rates have declined since then—reaching 76% in 2019.	To increase tire recycling, immediate policy steps are needed to incentivize the growth of new and existing markets for scrap tires.	Growth of this market would be a serious step towards increased circularity in the tire lifecycle.

Compared To Traditional Asphalt, RMA Has A Wide Range Of Benefits

Performance

- Offers better skid resistance, reducing accidents in wet weather.
- Extends pavement life when compared to traditional pavements made with unmodified binders.
- Improves resistance to cracking in high-traffic conditions.
- Reduces noise by a range of 1-10 decibels.
- Leads to smoother roads for motorists, resulting in better ride quality.

Economic

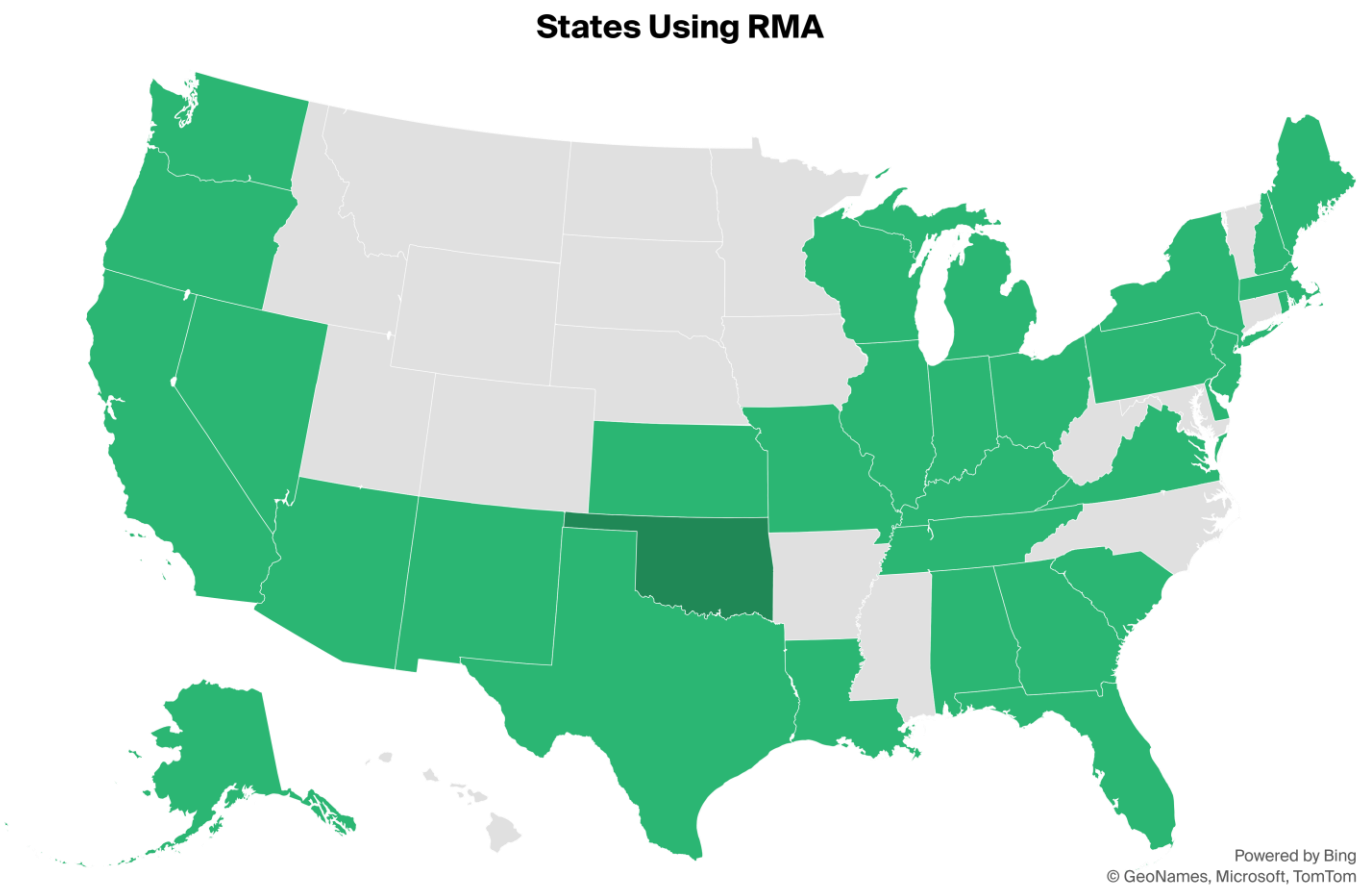
- Lowers cost-per-square-yard for overlays/patchwork compared to unmodified asphalt overlays—saving approximately 43%, with a 10% boost in pavement life.
- Saves drivers time and money by reducing vehicle repair needs and improving fuel efficiency through smoother pavement.

Environmental

- Reduces the overall lifetime CO2 emissions of the road due to the increased service life and low maintenance requirements of RMA-roads.
- Decreases tire production CO2 emissions since less tire wear enables decreased tire production.
- Contributes to the reduction of tire wear particles through by creating a more consistent driving experience and thereby improving water quality in roadway runoff.

Source: University of Missouri-Columbia

States That Use RMA Have Seen Success, Finding RMA To Be Both Effective And Cost-Saving



- Overall, **32 states** are already using or planning to use RMA in either test or field projects.
- States using RMA are **already seeing benefits** over traditional asphalt:
  - In Bend, Oregon, reports say that RMA usage will be approximately **$70,000 per-mile cheaper than a total asphalt resurface**, while also recycling about 250 ELTs per lane-mile paved.[1]
  - When the performance of RMA was tested, a county in Michigan's upper peninsula found that **RMA performed better in severe weather**.[2]
  - Upon implementing RMA pavement solutions, California public road construction and repair projects have reportedly **saved 20% over the last 2 decades**.[3]
  - The Alabama Dept. of Conservation and Natural Resources reported new **RMA roads will require less maintenance and have improved performance**.[4]
- In 2020, **based on the proven performance, safety, and environmental benefits of RMA**, the National Lieutenant Governors Association **adopted a resolution to support the use of scrap tires in RMA**.[5]

**dark green indicates project pending as of data collection*

State Data Source: *USTMA, Rubber-Modified Asphalt Report, June 2021*

[1] *KTVZ News*, 2/2/2021 | [2] *The Mining Journal*, 4/22/21 | [3] *Green Valley News*, 12/16/19 | [4] *YellowHammer*, 4/20/22 | [5] National Lieutenant Governors Assoc., 7/20

Investing In RMA Is A Savings Opportunity For States As They Advance Infrastructure Efforts

The Bipartisan Infrastructure Law **invests $110 billion in surface transportation infrastructure**, with a focus on sustainable, long-lasting results.

RMA is proven to provide long-lasting results with better performance. State departments of transportation, infrastructure coordinators, governors, and legislatures that use it are benefitting from these results.

Investing in RMA enables several benefits for states including:

- **Making roads last longer** by decreasing instances of cracking and rutting that lead to dangerous potholes.
- **Requiring less maintenance**, which saves taxpayer dollars and decreases burdensome roadwork delays
- **Improving safety** for drivers.
- **Saving money** over the lifetime of the road.

Life-cycle cost savings estimates for implementing RMA are up to 43% expected savings—but overall, **there is potential for important savings that would allow state and local budgets to go further and last longer.**