Testimony of the

U.S. TIRE MANUFACTURERS ASSOCIATION

In Support of

HOUSE BILL 781

presented to the

HOUSE ENVIRONMENT AND TRANSPORTATION COMMITTEE

STATE OF MARYLAND

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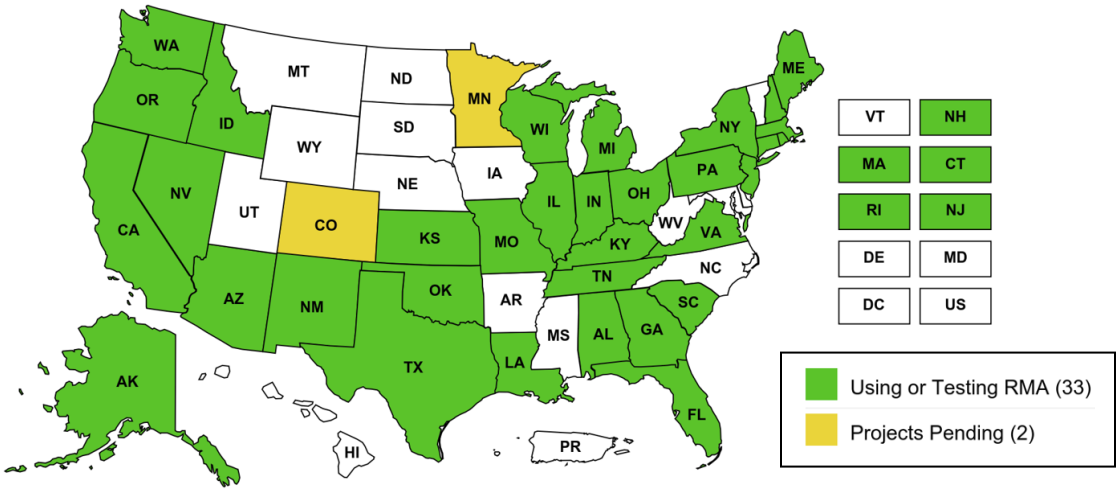
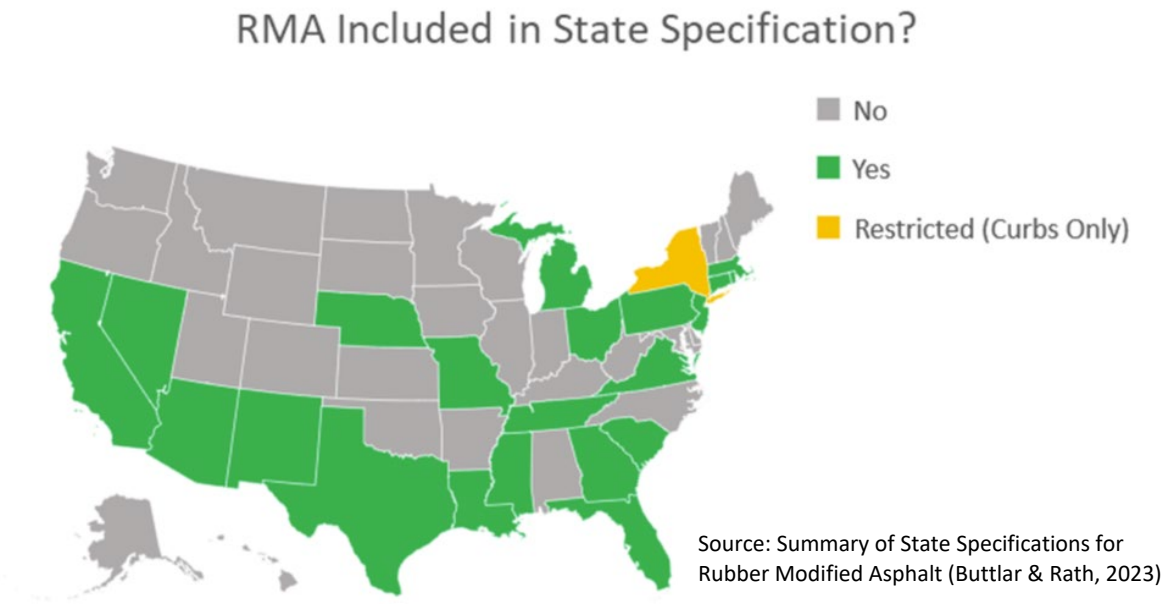
Good afternoon, Chair Korman, Vice Chair Boyce, and distinguished members of the House Environment and Transportation Committee, my name is Sean Moore, and I am testifying today on behalf of the U.S. Tire Manufacturers Association (USTMA) **in support of House Bill 781,** which would direct the Maryland Department of Transportation (MDOT) to utilize rubber modified asphalt (RMA).

USTMA is the national trade association for tire manufacturers that produce tires in the United States. Our 12 member companies operate 57 tire-related manufacturing facilities across 17 states. The U.S. tire manufacturing industry directly supports nearly 2,900 Maryland jobs and indirectly supports nearly 4,500 additional jobs across the state. In Maryland, tire manufacturing produces an annual direct economic impact of more than $529 million and generates more than $94 million in state and local tax revenue. USTMA advances a sustainable tire manufacturing industry through thought leadership and a commitment to science-based public policy advocacy.

Overview

Maryland has long been an outlier among states when it comes to rubber modified asphalt. Today, 35 states are using or testing RMA, and 21 states now include RMA in the material specifications published by their respective State Highway Agencies[i].





Source: Summary of State Specifications for Rubber Modified Asphalt (Buttlar & Rath, 2023)

While USTMA is supportive of the general underlying policy in HB 781, we understand some intermediate steps may be necessary to advance this issue to a point where RMA is a preferred roadway material in Maryland.

USTMA respectfully encourages the committee to:

1. Adopt legislation directing MDOT to:
    a. Conduct a series of pilot projects using RMA, and
    b. Develop material specifications for the use of RMA in Maryland roads.
2. Explore policies that would incentivize the state's road builders and engineers to familiarize themselves with RMA and scale up its use. This might include tax credits for:
    a. Attending educational seminars to learn best practices for using RMA (these are offered at industry conferences; the state of California has also developed an online college-level course[ii]), and/or
    b. The purchase of any new machinery needed to use RMA (needs vary dependent on which RMA process is used).

Background on rubber modified asphalt[iii]:

Nascency - first wave

The first experiments incorporating rubber bitumen into roads were conducted in 1840, though the concept remained largely experimental for the next century. In the 1960s, the commercial usage of scrap tire rubber in asphalt mixtures was developed in Europe and the U.S. at approximately the same time. It was 1968 when the Arizona Department of Transportation placed its first Stress Absorbing Membrane (SAM), a hot asphalt-rubber chip seal applied to a deteriorated pavement surface.

While the durability of RMA was readily apparent in these early applications, there was little widespread knowledge regarding best practices, and standards were not yet developed. By 1991, use of rubber modified asphalt was growing, when the federal government enacted the Intermodal Surface Transportation Efficiency Act (ISTEA), which contained provisions requiring states to use RMA. However, the program was repealed in 1995 and is largely remembered as a failure. According to Drs. Bill Buttlar and Punyaslok Rath, this was due to[iv]:

a) a lack of technology prevented contractors from producing high-quality mixtures on a consistent basis,

b) a lack of proper training of personnel compounded by a lack of understanding of the function of rubber in asphalt led to poor or inconsistent quality (for instance, it was not understood at the time that interaction time and temperature are crucial in the production of quality RMA), and

c) many technologies that were used in the pilot projects were still patented at that time, leading to high initial costs for RMA.

Second wave

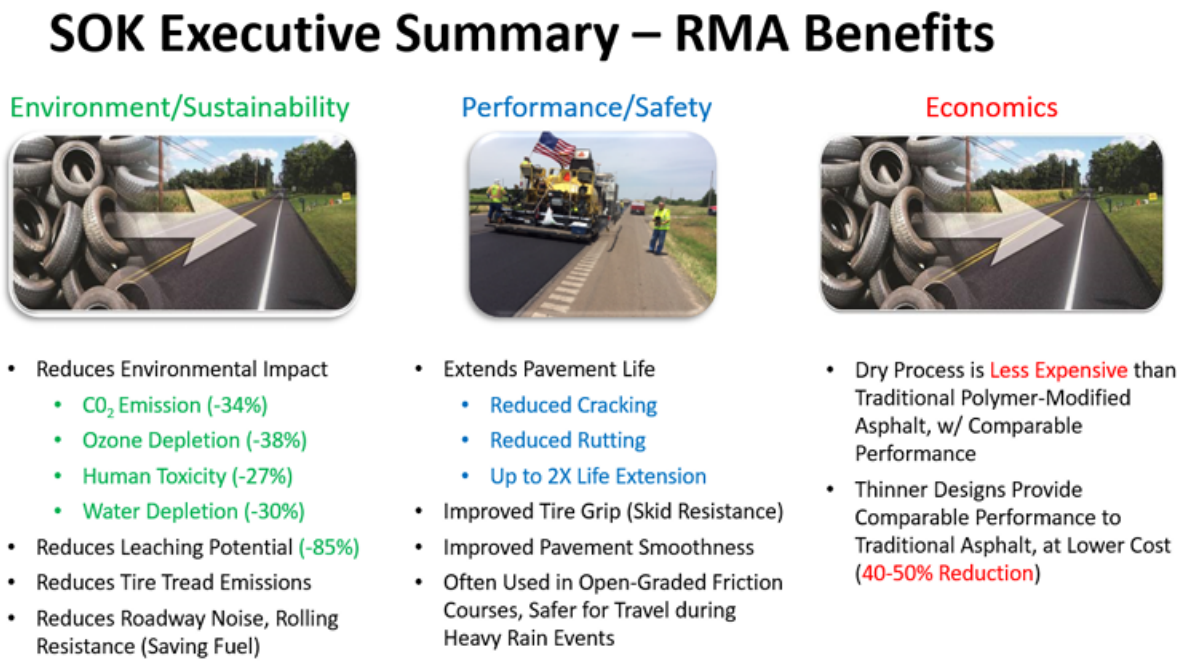
The market for rubber modified asphalt experienced significant expansion in the latter half of the 2010s, "partly due to new technologies available for modification and partly due to a better understanding of the mechanics behind rubber modification of asphalt mixtures" (Buttlar & Rath, 2021).

As states have increasingly focused on improving the sustainability of their transportation infrastructure, they've begun to take another look at rubber modified asphalt. The development of standards (e.g., ASTM International D6114/D6114M-19[v]) and best practices has now made RMA an attractive investment.

As a reflection of the renewed interest in RMA, the Federal Highway Administration, has published several guidance documents related to RMA:

- A **2021 overview of asphalt rubber gap-graded** as part of FHWA's Targeted Overlay Pavement Solutions (TOPS) program, which promotes pavement solutions with benefits including enhanced safety, longevity and performance, and cost savings through reduced maintenance needs[vi].
- "**Resource Responsible Use of Recycled Tire Rubber in Asphalt Pavements**"[vii] was issued in 2020 under FHWA's Accelerated Implementation and Deployment of Pavement Technologies Program to update the agency's earlier review of RMA, with a stated objective "to provide knowledge for resource responsible use of RTR to promote sustainable use in asphalt pavements."
- A **2014 Technical Brief** provided an overview of the various processes for using recycled tire rubber as a modifier for asphalt binders and as an additive for asphalt mixtures.

Benefits of rubber modified asphalt:



The above graphic is borrowed from a 2021 state-of-knowledge report conducted by the University of Missouri with funding from USTMA and The Ray (a nonprofit proving ground dedicated to developing safer, smarter, and more sustainable highways). The report is available online and hyperlinked in endnote iii.

The potential to address several persistent problems

As mentioned above, more states began to reexamine rubber modified asphalt as they started to focus more on the sustainability of their transportation infrastructure.

Problem: Need to increase the sustainability of the transportation sector and design roads and highways to be safer and more sustainable.

Solution: Rubber modified asphalt has lower emissions, enables vehicles to travel more efficiently and can reduce pollutants in stormwater; it also produces less road-spray in wet conditions and has improved skid resistance.

Problem: Disadvantaged communities are often disproportionately affected by road noise due to their closer proximity to high-traffic roads.

Solution: Rubber modified asphalt reduces road noise by up to 10 decibels; a lawsuit over Utah's Legacy Parkway was settled in part with an agreement that RMA be used to reduce road noise.[viii]

Problem: States are spending more to maintain roads.

Solution: RMA significantly extends pavement life (up to 2X), reducing maintenance costs and construction-related delays.

Problem: According to the Maryland Department of the Environment, more than 6 million scrap tires were produced in Maryland, and Maryland facilities processed more than 6.8 million scrap tires in FY23[ix].

Solution: Each lane mile paved with a 2-inch overlay of rubber modified asphalt consumes between 1,500 and 2,000 scrap tires.

Notable RMA usage in other states:

As noted above, RMA is currently being used in some form in two-thirds of the U.S. Some notable examples are provided below. California's experience is specifically cited, given the state is among the most experienced with a mandate like the one proposed in HB 781. The experiences of Illinois and Michigan are discussed below since both states specifically studied the performance of RMA in cold climates. Pennsylvania and Virginia are included, given they border Maryland, and each has material specifications for both wet and dry process RMA; Pennsylvania also considered RMA's performance in cold climates. Additional case studies are provided in the *Summary of State Specifications for Rubber Modified Asphalt* hyperlinked in endnote i.

California

According to California's Department of Resources Recycling and Recovery (CalRecycle), the state has used RMA for more than 30 years;[x] today it is a preferred road surface material. For close to two decades, the state has mandated a percentage of roads be paved with RMA (*see*: CA Pub Res Code § 42703 (2021)) with use rates increasing by year. Additionally, the state supports RMA usage through:

- **CalRecycle RAC grant programs** that provide financial assistance to local governments, specifically to fund RMA projects.
- **Engineering and technical assistance and training** to local jurisdictions in the state.
- **A state-maintained list of product and vendor information** in the California Tire-Derived Product Catalog.
- **A Green Roads Fact Sheet** used to educate local decision makers about the benefits, uses, and cost comparisons for RAC as a paving alternative.

Illinois

Illinois Tollway began using RMA in 2009. In 2016, the Tollway placed nine test sections on high traffic sections of I-88. Field testing in 2019 showed excellent performance for fracture energy tests ("project exceeded the 690 J/m2 threshold required for high traffic applications") as well as excellent crack and rutting resistance. The field evaluators noted, "These sections went through a 50-year cooling event due to the polar vortex experienced in late January, 2019, where air temperatures in the vicinity of Chicago dropped below -32F (-34C)."[xi] All mixtures were shown to perform well under the heavy traffic and cold weather of northern Illinois.[xii]

Michigan

In 2019, Michigan's Department of Environment, Great Lakes, and Energy (EGLE) performed a joint project with Michigan Technological University (MTU) and Dickinson County Road Commission, to evaluate the performance of rubber modified asphalt in the cold climate of Michigan's Upper Peninsula. The initial results have shown, "more resistance both to rutting during hot temperatures and cracking during cold weather."[xiii]

Michigan has been increasing its RMA usage since 2005. In 2022, EGLE issued a grant that paved five and a half miles of roadway in two counties and utilized approximately 59,500 scrap tires. According to EGLE, "The growing consensus is that rubber-modified paving is a winner for local roads."[xiv]

Pennsylvania

Between 2012 and 2015, the Pennsylvania Department of Transportation (PENNDOT) performed a series of four pilot projects to evaluate the performance of RMA on various Average Daily Traffic (ADT) roadways and on roads subject to Pennsylvania's climate. Despite the formal evaluation period for the project spanning a period of 10 years from the placement of the asphalt mix, the initial results were so promising that in 2018 – three years after the completion of these projects – PennDOT formally approved the use of rubber modified asphalt and included the studied technology in PENNDOT's construction specification.[xv]

Virginia

In August 2022, the Virginia Transportation Research Council (a partnership of the Virginia Department of Transportation and the University of Virginia) published a report with initial findings from a project using RMA on US-60. According to the authors, "The study found that dry process SM 12.5 (GTR) mixture can be produced and placed with no significant field-related concerns and that the special provision developed for its use was effective… Laboratory performance testing showed the [RMA] mixture to be more crack resistant than conventionally modified polymer (SM 12.5E) mixtures."[xvi]

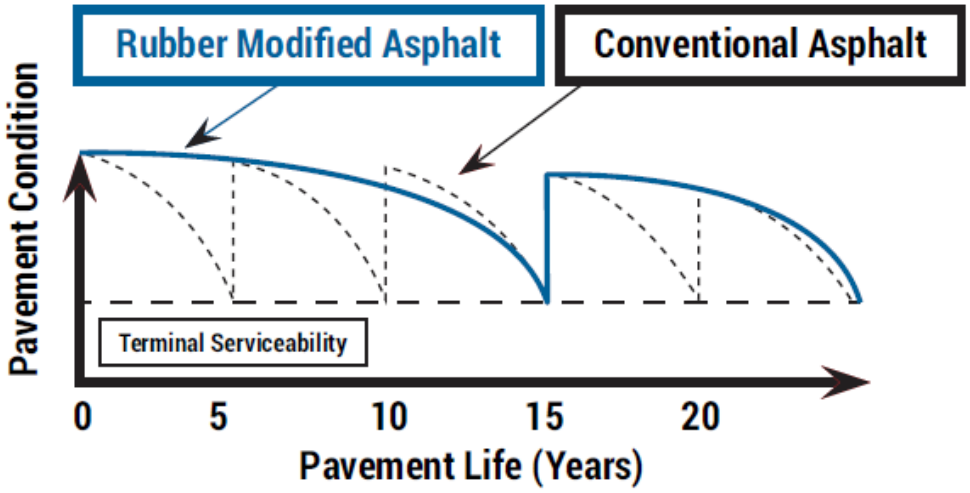
According to the Virginia Asphalt Association (VAA)[xvii]:

> *Today, VAA, VDOT and Virginia asphalt contractors are conducting joint efforts to utilize [ground tire rubber] in other mixes used on VDOT projects as an alternative to polymer modification. The ultimate goal is to produce a mixture that provides superior performance at a lower cost. Research conducted by other agencies has shown the value of these mixes…This not only will reduce the initial and long-term cost of the pavement, but has significant environmental impacts through the reduced demand on new asphalt binders and reduction in landfilled materials.*

<u>Opportunity in Maryland</u>:

As noted in the Fiscal and Policy Note for HB 781, the State Highway Administration (SHA) replaced an average of 720 miles of asphalt road each year over the last five years.[xviii] **If those lane miles were replaced using rubber modified asphalt, it would consume nearly 1.5 million tires annually**. While SHA's preliminary projections anticipate higher initial costs to install RMA, it does not account for cost savings

realized through delayed maintenance, repair, and/or rehabilitation activities, given RMA can provide up to double the service life of pavement compared to conventional asphalt. In other words, the use of a life-cycle cost analysis often shows reduced costs to the agency in the long run, as shown in the figure below.[xix]



Schematic on maintenance phase for rubber-modified pavement compared to conventional pavement. (adapted from (R. Hicks, Lundy, & Epps, 1999))[xx]

Federal grants to make RMA cost-neutral on the front end.

The Inflation Reduction Act (Public Law No: 117-169) created federal grant opportunities that can be accessed to eliminate any added front-end costs of using rubber modified asphalt. Specifically, Sec. 60501, §177, (a)(2) – Competitive Infrastructure Technology Grants authorizes the Federal Highway Administration to distribute competitive grants that address greenhouse gas emissions, permeable/porous pavement, and road safety. RMA is proven to reduce carbon emissions through increased fuel economy, to act as a permeable pavement, and to increase driving safety by improving wet grip and reducing road spray.

MDOT should be directed to revise its material specifications to allow for the use of rubber modified asphalt. As noted in the case studies above, RMA has applications beyond the purview of SHA. By including RMA in the material specifications, the benefits associated with RMA could be realized by counties and local governments through their own road maintenance projects.

Scale of potential benefits to including RMA in material specifications.

According to MDOT's 2022 Annual Mileage Report, there are more than 26,000 miles of county and municipal owned roads in Maryland.[xxi] The analysis SHA provided for the Fiscal and Policy Note for HB 781 notes SHA typically replaces 720 miles of asphalt road annually out of the approximately 5,200 miles it owns (14%). If county and municipal roads are resurfaced at the same rate, approximately 3,600 miles of county and municipal roads would be resurfaced each year. Using RMA on just the county and municipal roads could consume between 5.6 million and 7.2 million tires. Put another way, **the expected annual paving of Maryland roadways could consume all the scrap tires produced in Maryland in a given year**, which would yield all of the economic, environmental and safety benefits discussed above.

USTMA's interest:

USTMA members share a common goal that 100% of scrap tires enter sustainable and circular end-use markets. Successful scrap tire management depends on the availability of sustainable and circular end-use markets. USTMA seeks to grow these types of markets to ensure scrap tires are properly managed to prevent stockpiles and illegal dumping.

USTMA is a leader in advocating strong scrap tire laws, which have reduced stockpiled tires by 95% nationwide – from over 1 billion in 1990 to 50 million in 2021.[xxii] Scrap tires are now one of the most recycled consumer products, with 71% of tires consumed in beneficial end-use markets. While this number is impressive, additional policies are needed to increase that percentage to 100.

USTMA works with stakeholders, including the federal and state governments to incentivize market development and advance federal and state regulations that foster sustainable scrap tire markets. Rubber modified asphalt not only provides a circular and sustainable end-use for scrap tires, but it also produces more sustainable infrastructure.

Conclusion

Successful scrap tire management depends on the availability of sustainable and circular end-use markets. Maryland has an opportunity to become a leader in sustainable scrap tire management while enhancing the sustainability of its state and local roads.

The economic, environmental, and safety benefits associated with rubber modified asphalt make it an ideal material for producing more sustainable transportation infrastructure in Maryland.

Legislative direction is needed to ensure MDOT's Standard Specifications for Construction and Materials allow for the use of rubber modified asphalt. USTMA respectfully urges the committee to direct MDOT to begin this important work and to explore policies to incentivize the state's road builders and engineers to familiarize themselves with RMA and scale up its use.

We sincerely appreciate your consideration of our position on this important issue. I am happy to answer any questions you might have.

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