

Landmark Study Finds Asphalt Pavement Emissions More Than 250 Times Lower Than Previously Reported

Brussels, 8 October 2026 - *Peer-reviewed research finds emissions from asphalt pavements are minimal, highly localised, and tied to the pavement surface — not the bulk material.*



A new peer-reviewed study led by researchers at the University of California, Riverside (UCR), with support from leading experts across the asphalt industry, finds that emissions from asphalt pavements are minimal, highly localised, and more than 250 times lower than previously reported. The study found that the measured emissions are a surface-related phenomenon observed under real-world conditions, rather than a bulk material emission.

Published in *American Chemical Society Environmental Science & Technology Air (ACS ES&T Air)*, the study combined controlled laboratory testing with measurements from in-place pavements exposed to environmental conditions. Laboratory testing used representative asphalt pavement samples under realistic temperatures and full-spectrum solar exposure. The researchers also evaluated the formation of secondary organic aerosols (SOAs), particles that can form when emitted chemicals react in the atmosphere. The results showed that measured emissions were primarily associated with the pavement surface rather than the bulk asphalt material.

By evaluating both compacted pavement samples and in-place road surfaces, the researchers examined emissions under conditions designed to better reflect how asphalt pavements behave in service. The findings offer an additional perspective on previous research that estimated substantially higher emissions from asphalt materials. Much of that earlier work relied on laboratory measurements of small, uncompacted asphalt samples rather than real-world, in-place pavement.

"This research brought together academia and industry to better understand potential sources of atmospheric emissions from compacted roadways," said David Cocker, professor and chair of UCR's Department of Chemical and Environmental Engineering and lead researcher on the study. "By combining controlled laboratory testing with measurements from in-place pavements, we were able to evaluate emissions using a more comprehensive approach that reflects the

conditions pavements experience in the environment.”

The research was conducted through UCR’s Marlan and Rosemary Bourns College of Engineering – Center for Environmental Research and Technology (CE-CERT), which provides advanced capabilities for emissions and environmental research. Cocker’s research focuses on atmospheric chemistry, emissions and air quality.

“This research demonstrates the value of credible, independent science in advancing our understanding of asphalt pavement emissions,” said Reed Ryan, president of the Asphalt Institute. “By supporting rigorous, peer-reviewed research, we can help ensure that discussions about asphalt pavement emissions and air quality are informed by accurate data and real-world conditions.”

The research was commissioned by the Asphalt Institute, National Asphalt Pavement Association (NAPA), Eurobitume, the European Bitumen Association, and State Asphalt Pavement Associations Inc. (SAPA).

“Investing in and advancing fact-based, technical research to continuously improve engineering and construction practices is fundamental to NAPA and the asphalt pavement industry. This study adds proof that in-place asphalt pavements do not adversely impact air quality,” said Audrey Copeland, PhD, PE, president and CEO of NAPA. “In partnership with scientists and experts, we are continually seeking to understand our impact and improve our product as well as manufacturing and paving practices. This work advances our understanding and further informs the asphalt pavement industry’s sustainability and emissions goals.”

“These findings provide valuable information for state asphalt pavement associations and the communities they serve,” said Kevin Burke, executive vice president of the Illinois Asphalt Pavement Association and 2026 SAPA chairman. “Our communities deserve straightforward, fact-based answers to important questions about asphalt pavement emissions, and this research helps advance that understanding.”

Eurobitume Director General Hervé Millet said the research reflects the importance of international cooperation in advancing scientific understanding of asphalt and bitumen.

“This study demonstrates the value of international collaboration in advancing our understanding of environmental performance,” said Millet. “By bringing together expertise, advanced technologies and rigorous analytical methods, the industry can continue to strengthen the scientific understanding of bitumen and asphalt and their role in a more sustainable transportation system.”

Taken together, the findings give regulators, researchers, transportation agencies, policymakers and the public a stronger scientific foundation for evaluating asphalt pavement emissions throughout its service life, and reinforce that in-place asphalt pavement should not be characterised as a significant source of urban smog-forming or other chemical atmospheric emissions based on the conditions evaluated in this study.

The full study, “Primary and Secondary Emissions from In-Service Compacted Hot Mix Asphalt Pavement,” is published in *ACS ES&T Air*. The study is available at <https://pubs.acs.org/doi/10.1021/acsestair.6c00071>.



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About Eurobitume

Established in 1969, Eurobitume is the voice of Europe's bitumen industry. Bringing together producers, marketers, users, hauliers, etc., the association's purpose is to develop and promote the safe, sustainable and efficient use of bitumen in road, industrial and building applications.

Through its network of experts, Eurobitume develops guidance, contributes to regulatory and technical discussions, and supports the continuous improvement of industry standards across Europe.

Representing its members, Eurobitume combines industry expertise and insight to support dialogue with policymakers and engagement across the entire bitumen value chain. It promotes best practices in health, safety, environmental stewardship, and technical excellence, while communicating the value and benefits of bitumen through credible, evidence-based information.

For more information, visit eurobitume.eu.

About the Asphalt Institute

Founded in 1919 and headquartered in Lexington, Kentucky, the Asphalt Institute is an international trade association representing asphalt producers, manufacturers and affiliated businesses. The Asphalt Institute advances the quality and performance of asphalt through research, engineering services, education and professional certification programs. The organization also shares industry expertise through Asphalt magazine, now in its 77th year, and events held throughout the year, including its spring, summer and annual meetings.

For more information, visit asphaltinstitute.org.

About NAPA

The National Asphalt Pavement Association (NAPA) is the only trade association that exclusively represents the interests of the asphalt pavement material producer/contractor on the national level with Congress and government agencies. Founded in 1955, NAPA supports research and technical education to improve the quality of asphalt pavements and paving techniques used across the nation. Learn more at AsphaltPavement.org

About SAPA

The State Asphalt Pavement Associations Inc. (SAPA) is a non-profit trade association comprised of executives of the various state asphalt pavement associations across the United States. The organization's mission states that "we are a professional membership organization of state asphalt associations that support the advancement, education, and promotion of asphalt pavements." To learn more about SAPA, visit the organization's website at: www.sapainc.org.