NATIONAL ASPHALT PAVEMENT ASSOCIATION

October 13, 2022

U.S. Department of Transportation
Docket Operations, M-30
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: Proposed Rulemaking; National Performance Management Measures; Assessing Performance of the National Highway System, Greenhouse Gas Emissions Measure (RIN 2125-AF99)

Dear Sir/Madam:

The National Asphalt Pavement Association (NAPA) appreciates the opportunity to provide comments on Docket Number Federal Highway Administration (FHWA)-2022- 14679: "National Performance Management Measures; Assessing Performance of the National Highway System, Greenhouse Gas Emissions Measure." With more than 1,100 member companies, NAPA is the only trade association that exclusively represents the interests of the asphalt pavement producer/contractor on the national level with Congress, government agencies, and other national trade and business organizations. NAPA's membership includes companies and individuals that support the asphalt pavement industry, such as construction equipment manufacturers and material suppliers.

NAPA members are leaders in implementing sustainable plant and pavement technologies, such as Reclaimed Asphalt Pavements (RAP) and Warm-Mix Asphalt (WMA), that reduce environmental impacts and emissions. This letter includes our comments regarding consideration of a greenhouse gas (GHG) emissions measure, pavements' role in reducing emissions, and our support for FHWA's existing leadership role in sustainability and efforts to reduce GHG emissions.

In January 2022, NAPA released *The Road Forward*, a plan to lead the asphalt production industry to net zero carbon emissions by 2050. The plan centers around four specific goals:

1. Achieve net zero carbon emissions during asphalt production and construction by 2050.
2. Partner with customers to reduce emissions through pavement quality, durability, longevity, and efficiency standards by 2050.
3. Develop a net zero materials supply chain by 2050.
4. Transition to electricity from renewable energy providers in support of net zero carbon electricity generation by 2050 and reduce electrical intensities.

The asphalt pavement industry does not have specific controls over on-road vehicular emissions; however, the emissions associated with pavement vehicle interaction are included in Goal 2 of *The Road Forward's* four goals. Therefore, in alignment with these goals, NAPA agrees that efforts should be taken to ensure the performance of our transportation systems while protecting our natural environment.

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NAPA recognizes the desire to estimate and measure GHG emissions to inform decisions and reduce long-term emissions. This plan includes reducing the role of embodied and operational carbon in emissions. As transportation is a major source of emissions in the United States, it is imperative to reduce related emissions to achieve the country's net zero goals.

The current proposed rulemaking focuses on vehicle miles traveled, fuel type, and total fuel used. While all three of these factors influence transportation emissions, they are not the sole factors that impact transportation emissions. The properties of the pavement network are a factor influencing GHG emissions from vehicles. We can enhance environmental performance by enhancing the condition of our highway system. Highways in good condition improve vehicle fuel economy, thereby reducing emissions. Thus, the smoothness components of the National Performance Measures for Interstates and the National Highway System (NHS) are critical to ensure highway funding is properly directed to the greatest need to improve the condition of our nation's highways. In doing so, State Agencies will also be directing funding at the most efficient way to reduce vehicular emissions on the road.

Pavements' Role in Reducing Emissions

Pavements play a role in reducing on-road mobile source emissions since pavement condition directly affects vehicle fuel economy. In a highway's life-cycle, the use phase contributes most to emissions; thus, it is critical that our highway infrastructure is maintained in good, smooth condition. According to TRIP[1], 40 percent of the nation's major roads (Interstates, freeways, and other arterial routes) have pavements that are in poor or mediocre condition, generating unacceptably rough rides for motorists. Thirty-two percent of urban roads, which carry the majority of US traffic, are in poor condition and 24 percent are rated mediocre. As will be shown, maintaining the current infrastructure in a state of good repair will reduce transportation emissions by improving vehicular fuel economy.

Currently, the rule focuses on taking vehicles off roads, whereas improving the quality of the ride also allows users to continue being efficient while using this country's vast highway network. Housed under FHWA, this rule does not take into account that reducing vehicle miles traveled (VMT) from roads typically requires emissions from another source of transportation. Therefore, while on-road emissions are reduced, unless zero-emission transportation is used, these alternative transportation emissions are not accounted for in this rulemaking.

NAPA encourages FHWA to first and foremost consider the positive impact of well-maintained pavements on vehicle and GHG emissions, focusing its efforts on funding and maintaining the condition of the highway network. This priority has already been addressed in FHWA's effort to establish National Performance Measures for preserving, maintaining, and improving the Interstates and NHS; these performance measures should be well established before adding emissions as a performance measure.

The pavements' influence on vehicle emissions, commonly referred to as Pavement Vehicle Interaction (PVI) is based on smoothness, texture, and structural response. Numerous research studies demonstrate the importance of smoothness on PVI. Research sponsored by FHWA and the National Cooperative Highway Research Program (NCHRP) showed that improving smoothness of a road can decrease vehicular fuel consumption approximately 4.5 percent[2], while studies from the University of Michigan[3], University of Illinois[4], France[5], Sweden[6], and the Missouri Department of Transportation[7] corroborate the importance of smoothness on fuel economy. It has also been proven that texture plays an important, if secondary, role to smoothness[5,6,8].

Research into the pavements' structural response and the relationship to fuel economy has so far been inconclusive, but research is ongoing. In 2015, FHWA published report FHWA-HIF-15- 002, *Toward Sustainable*

Pavements: A Reference Document[9], which serves as a state of the science regarding roadway pavement sustainability and addresses vehicle emissions via PVI as a part of the use phase. The FHWA report states, "it can be said with reasonable certainty that the influence of structural responsiveness on fuel economy and associated environmental impacts has not been comprehensively validated." A review of literature on PVI by the National Center for Asphalt Technology (NCAT)[10] came to a similar conclusion; 12 studies between 1979 and 2012 showed that constructing and maintaining smoother roads will improve vehicle fuel economy, while 21 studies investigating structural responsiveness had no consistent findings. Industry has worked with Auburn University to develop a device that directly measures vehicular rolling resistance and encourages FHWA to support efforts to validate theoretical models through research funding.

Any effort to measure GHG emissions from vehicles, including consideration of highway (i.e., pavement) performance, should include an accurate metric for pavement condition and performance that includes pavements' most influential factor on vehicle fuel economy—smoothness—and focus efforts on properly measuring and relating smoothness for estimating GHG emissions.

FHWA's Leadership in Pavement Sustainability

We want to highlight and commend FHWA's leadership and current efforts for sustainable pavements, which includes efforts to provide guidance for quantifying pavements' impact on the environment and PVI research. We are proud to be partners in one such effort, the FHWA Sustainable Pavements Technical Working Group (SPTWG), a joint government (Federal, State, local), academia, and road-building industry group. The SPTWG has already published a Sustainable Pavement Reference Document and Pavement Life-Cycle Assessment Framework[11]. The SPTWG is currently drafting a road map that will likely include the implementation of pavement life-cycle assessment (LCA) and quantifying pavements' impact on the environment.

NAPA encourages FHWA to consider the recommendations of the SPTWG when considering the development and implementation of GHG emissions measures. We are grateful to partner in FHWA's leadership in the area of transportation-related GHG emissions reduction strategies and recommend that the current focus remain on maintaining and improving our highway conditions to good condition or better.

NAPA greatly appreciates the opportunity to provide comments regarding this proposed rulemaking. If you have any questions or need more information, please contact us. We look forward to working with you.

Sincerely,

J. Richard Willis, Ph.D.
Vice President – Engineering, Research & Technology

Joseph Shacat
Director – Sustainable Pavements

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[11] Harvey, J.T., J. Meiher, H. Ozer, I. Al-Qadi, A. Saboori, & A. Kendall. 2016. *Pavement Life-Cycle Assessment Framework*. FHWA-HIF-16-014, Federal Highway Administration, Washington, DC.