Review of: "Effective use of Waste Materials: A Case Study of Utilization of Fly Ash in Flexible Pavement Structures"

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Potential competing interests: No potential competing interests to declare.

The study provides valuable insights into the utilization of fly ash in pavement construction. However, there are several shortcomings and areas for improvement in the research, which are as follows:

- The lack of field-testing studies on asphalt concrete modified with fly ash is a significant gap. Field testing is crucial to assess the real-world performance of pavement layers under actual traffic and environmental conditions. Without comprehensive field testing, the practical effectiveness and durability of fly ash-modified pavements remain uncertain.
- The review mentions common tests like Marshall stability and tensile strength for asphalt concrete, but it doesn't delve into other important performance indicators such as rutting resistance, fatigue life, and moisture susceptibility. A comprehensive evaluation of these properties is essential to gauge the overall performance of fly ash-modified pavements.
- While the study highlights the use of fly ash as a filler material in flexible pavement layers, it lacks a thorough comparison with conventional materials such as limestone fillers or natural aggregates. Such a comparison would provide insights into the relative performance, cost-effectiveness, and environmental impact of using fly ash in pavement construction.
- Long-term durability is a critical aspect of pavement performance, especially considering factors like aging, environmental degradation, and cyclic loading. The study should provide more discussion and analysis on the long-term durability of fly ash-modified pavements compared to conventional pavements.
- The study lacks a comprehensive analysis of the economic viability and cost-effectiveness of using fly ash in pavement construction. Factors such as initial material cost, construction costs, maintenance requirements, and lifecycle costs should be considered to evaluate the overall economic feasibility of fly ash-modified pavements.