

Towards a Prospective Analysis for the Design of Asphalt Mixtures and Pavement Construction

By Pablo del Aguila¹

For several decades, the design of asphalt mixtures in Latin America has traditionally been carried out using a single procedure: the Marshall Method, a situation that persists in many countries. This approach has been characterized by a regulatory analysis aimed solely at meeting a set of unchanging specifications, inherited over decades and originating in other old times. These specifications were designed for load conditions and materials vastly different from those of today, as if the world and its realities had remained static.

This regulatory design does not respond to the actual behavior of asphalt pavement, whose properties fundamentally depend on the characteristics of the asphalt mixture produced according to that design. This reality shows us that, currently, there is an anachronistic and purely legalistic construction practice, completely disconnected from technological development and, therefore, from the long-term performance of road infrastructure.

Designing solely to comply with long-standing specifications, without considering the actual behavior of the pavement, results in a lack of comprehensive understanding of the ongoing dynamics of materials and procedures that determine durability and long-term performance. A more holistic and performance-based design is necessary to improve the quality of infrastructure. In modern engineering, it is important that practices evolve with the advancement of technology and knowledge. While regulations are necessary to ensure safety and quality, they must also be flexible to incorporate new methods, criteria, and materials, with compliance being a means to a greater end rather than an end in itself.

Focusing on durability and long-term behavior is essential for road infrastructure. A design and construction approach that does not consider these factors can lead to unnecessary disqualification of materials, higher construction costs, or increased maintenance and repair costs over time. It is essential to update and modernize the design of asphalt mixtures in Latin America. The adoption of an integrated approach with other construction processes, based on behavior rather than purely regulatory and traditional methods, is unquestionable and urgent.

In this context, the use of prospective analysis is crucial. This approach would allow for anticipating and adapting the design and construction practices of asphalt pavements to future load conditions and materials, anticipating technological changes and emerging infrastructure needs. By incorporating prospective management, better planning and execution of road projects can be achieved, ensuring they are sustainable, resilient, and durable over time. Thus, it is possible to move towards a more modern and effective construction practice, aligned with current and future realities, improving the long-term quality prospects of road infrastructure in the region.

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