Editorial: Special Section on Durability, Functionality, and Sustainability of Road Materials and Structures

With the emergence of extreme climate and increasing traffic load in recent years, the performance requirements for transportation infrastructure materials are increasing. Sustainable transportation infrastructures have attracted much attention from the research community and industry. Building and preserving efficient, reliable, and sustainable roads is crucial for economic and social development. The design of road materials and structures significantly influences road durability. The main components of road materials are bitumens, additives, bituminous mixes, asphalt concrete, cement concrete, unbound granular materials, soils, and geo-composites. The new and innovative materials, mix design, soil stabilization, and environmental aspects of handling and reuse of road materials are also crucial. The road performance can be affected by vehicle loading and environmental conditions including light, temperature, oxygen, and moisture, etc. An accurate assessment of road performance, stress and strain state, and the environmental effects has always been a challenge faced by this industry.

This special section of Journal of Testing and Evaluation published by ASTM International includes 15 peer-reviewed papers. These papers introduce recent work that furthers an understanding of durability, functionality, and sustainability of road materials and structures and covers diversified topics such as the following: (1) mechanism study of road material performance including aging, recycling, and fatigue; (2) development and evaluation of innovative materials or technologies in road engineering including natural rubber latex composite modified asphalt, subgrade geogrids, polyether polyurethane concrete, basalt fibers, and cement mortar used in prefabricated road base; (3) performance evaluation of road materials and structures including polishing and anti-skidding; (4) mechanical analysis of road structures including modulus back-calculation of road structure, dynamic response of deck pavement, and...
monitoring and evaluating mountain-expressway slope safety. This special issue also lays out an interdisciplinary framework that not only aims to advance specific areas of science and engineering but also to help advance the state of practice in road engineering.

Last but not least, I would like to extend my warm thanks to all the reviewers that kindly agreed to evaluate all the articles and contributed to the scientific quality of this special issue.