Many road managers and stakeholders are looking for more and better options for the construction and maintenance of flexible and rigid pavements. Well-designed strategies for pavement construction and maintenance have attracted the interests of researchers since a large number of existing pavements are facing deterioration all over the world. The selection and engineering properties of paving materials are crucial factors affecting the durability and therefore demanding standards of sustainability of the constructed pavement. Researchers worldwide are putting extensive efforts to develop and promote advanced pavement materials and structures for constructing and maintaining sustainable pavements. Pavement materials that can improve durability, cut costs, reduce depletion of raw materials, and lower environmental impacts are desirable for such purposes. Meanwhile, some new design ideas that differ from traditional pavement structures have shown noticeable benefits in terms of pavement durability or cost. In this regard, exploring the benefits of using advanced materials in flexible and rigid pavements is continuously investigated and has currently gained increasing attention. The articles of this issue cover original research papers that will contribute to the development and implementation of advanced pavement materials for sustainable transportation infrastructure.