

# **Lecture Notes in Intelligent Transportation and Infrastructure**

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Dipankar Deb · Valentina E. Balas  
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Editors

# Innovative Research in Transportation Infrastructure

Proceedings of ICIIF 2018

 Springer

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ISSN 2523-3440                      ISSN 2523-3459 (electronic)  
Lecture Notes in Intelligent Transportation and Infrastructure  
ISBN 978-981-13-2031-6              ISBN 978-981-13-2032-3 (eBook)  
<https://doi.org/10.1007/978-981-13-2032-3>

Library of Congress Control Number: 2018950818

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# Preface

This edited book, *Innovative Research in Transportation Infrastructure*, is an outcome of the First International Conference on Innovation in Infrastructure. The chapters aim to present a full picture of the state of the art in modern technology, innovations, and need of the transportation systems, construction, and maintenance methodology and many more, to fulfil the infrastructural gap. Nowadays, inefficient utilization of transportation infrastructure has turned out to be one of the significant issues of road safety for fast-growing urban and rural regions. Numerous initiatives are taken by the government bodies and engineers while keeping in mind the end goal of evolving sustainable transportation by providing smart transportation infrastructure. In order to understand the various issues and probable solutions, the chapters provide in-depth study related to rural and urban infrastructures through various case studies on the deficiency of transportation systems and fundamental problems related to infrastructure.

Some case studies also provide a solution adopting multimodal transportation framework to improve the system in a productive and efficient way. In addition, mobility is a key challenge in sustainable transportation worldwide with a rapid growth of urbanization. As a result, cities experience several traffic-related problems and are major contributors towards greenhouse gas emissions. The chapters in this edited book also contribute to resolving the problem by developing a performance measurement framework using a fuzzy multi-criteria decision-making (MCDM) approach to assess the progress of city performance through service-level benchmarks.

Looking at the current scenario of growing vehicle population, there is a need for the development of new infrastructure for long-distance travels. The chapters also cover modelling techniques and simulation studies which are helpful for evolving fundamental diagrams, determining capacity and level-of-service (LOS) thresholds. Apart from these, evacuation modelling is also covered in order to develop the infrastructure, particularly in disasters.

Another important component is intelligent transportation systems (ITSs) which provides a smart solution to minimize the impact of traffic leading to collision by adopting technological innovations such as Wi-fi, Bluetooth and in-vehicle adaptive control system for safe driving on road or at junctions.

Non-motorized transport is an inevitable component of the holistic development of infrastructure. A chapter in this book also discusses the historical overview of the public bicycle-sharing system that highlights the various PBS systems operated and popularly known for bringing radical changes in transportation systems.

Roads and their maintenance are one of the most important assets for the consequential progress and fetch social benefits of any country. Improper road maintenance can lead to a state of expensive rehabilitation and reconstruction, and the concept of managing roads as assets is not served. The chapters in this book also contribute towards the development of technology to improve road construction methodology and their maintenance and management by introducing a concept like public–private partnership (PPP) to ensure functional efficiency.

Overall, the chapters open new avenues and bring interesting facts to understand the problems and provide unique solutions for sustainable transportation which would help planners to design and implement for the development of efficient infrastructure.

The editors are grateful to Mr. Aninda Bose, Senior Editor, Springer, for publishing these chapters in Lecture Notes in Intelligent Transportation and Infrastructure. We are also grateful to the anonymous reviewers for their comments which led to substantial improvements and reorganizations of these chapters.

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