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EDITORIAL

Special issue on Advances in Transportation Science

This special issue of Journal of King Saud University – Science focuses on the Advances in Transportation Science as the subject of various studies due to the wide range of applicability of these research areas. The main goal of this issue was to provide a forum for engineers and scientists to present their up-to-date findings and innovative ideas in the field of Transportation Science.

This special issue comprising of eight papers is focused on the various aspects of Transportation Problems and their solutions. All papers are subject to rigorous reviews and selected on the basis of their acceptances. The papers are presented beginning with "Development of a Culvert Inventory and Inspection Framework for Asset Management of Road Structures", by Mohammad Najafi, and Deepak Varadarajan Bhattachar. They have developed a model for culvert inventory and inspection as a part of the asset management strategy for preserving our deteriorating culvert infrastructure. The developed models for a condition rating system and performance calculator will assist the state and local agencies in categorizing the culverts in different zones and develop short and long term schemes in order to making proper decisions and implementing a good asset management program for each zone.

"An Integrated Approach for Optimal Rail Transit Corridor Identification and Scheduling Using Geographical Information System," written by Ashish Verma, Devendra Upadhyay, comes next. The presented train scheduling model is able to identify optimal schedules and fleet size for train operation, by optimizing the in-vehicle time, waiting time, and vehicle operating cost subject to constraints for waiting time, and load factor. The dwell time of train at stations has been taken as a variable which depends on the actual number of passengers boarding and alighting the train. A real case in Mumbai metropolitan region, India is presented with successful findings, and it is demonstrated that the proposed model is applicable for the planning of a new rail system for Indian cities.

Hooi Ling Khoo in the third paper, "Dynamic Penalty Function Approach for Ramp Metering with Equity Constraints", applies a dynamic penalty approach for considering the ramp metering efficiency and equity issue as a non-linear programming model. In this study, formulated equity indexes are defined to capture the degree of equity of the ramp metering, as constraints. It is also note worthy that a modified cell transmission model (MCTM) is selected to simulate the traffic flow in the network.

The fourth paper "Estimation of origin–destination matrices for mass event: A case of Macau Grand Prix" by K.I. Wong and Siou-Au Yu presents an empirical study of traffic planning and evaluation for mass-events using transportation network analysis approach. Mass-event activities in a city attract a large amount of participants and could create huge impacts to the transportation network and its accessibility, and therefore a corresponding traffic control plan and evaluation tool are very important. In their paper, an origin-destination matrix estimation model incooperating historical demand matrices and limited link traffic counts is proposed to estimate the change of traffic pattern during a mass-event, and a case study of Grand Prix motor-racing event in Macau is presented.

In the Fifth paper, "Application of particle swarm optimization to transportation network design problem", Abbas Babazadeh and his colleagues benefit from a well-known heuristic algorithm, particle swarm optimization (PSO), for analysis of Transportation network design problem (TNDP) aiming at minimizing total travel time considering resource limitations as a bi-level programming model. They have concluded the performance of PSO algorithm is comparable with Hybridized Ant Colony Optimization HACO.

According to the importance of environmental problems which have been of great concern to the scientists, the sixth paper written by P.J. Perez-Martiinez, D. Ming, G. Dell'Asin and A. Monzon, "Evaluation of the influence of toll systems on energy consumption and CO_2 emissions: A case study of a Spanish highway," considers the energy consumption as well as CO_2 emissions of road highway transportation under three conditions including "free flow", "stop and go" and "Electronic Toll Collection (ETC)" systems. Results in scenarios show that parameters such as gradient of the road, wind exposure, vehicle mass, mass correction factor for rotational inertia

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acceleration, acceleration and engine efficiency have a major impact on energy consumption.

Failures in current methods of rail operations can have catastrophic consequences. Positive Train Control (PTC) systems can eliminate the consequences of collision or derailment. In the seventh paper, ''Positive Train Control (PTC) failure modes'', Mark Hartong et al. explain PTC systems, their functionality, and how it can augment or replace existing methods of operation. They also discuss the regulatory framework in which PTC systems are installed.

Hooi Ling Khoo and Lay Eng Teoh in the last paper, ''An aircraft acquisition decision model under stochastic demand'', formulate an aircraft acquisition decision model aiming at maximizing the airline companies' profit. They develop an optimization model considering probabilistic dynamic programming approach in order to capture the stochastic demand which is assumed to be normally distributed. The proposed model is then converted as a linear programming model for the development of solution algorithm. With reasonable numerical examples, the model is shown to be useful for an airline company to make better and profitable decisions in the competitive airline industry.

Finally, I would like to thank the publisher, the guest editors, and reviewers for contributing so much to this special issue. They have been essential throughout the gestation process, and I am sure they will keep lending to the journal high dedication and expertise to warrant superior quality in each article and on time delivery of each issue. Our gratitude is extended to the many authors who sent early contributions after responding within a short period of time to our invitation to submit. Our special thanks go to Prof. Khaled Al-Rasheid for his kind advices and supports during the preparation of this Special Issue. We hope that this Special Issue will be of interest for a broad community, and results presented here will stimulate further research in this area.

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