GUEST EDITORIAL PREFACE

Special Issue on Operation Research and its Application in Transportation

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In the context of the *5th International Congress on Transportation Research* (ICTR), the Hellenic Institute of Transportation in collaboration with *International Journal of Operations Research and Information Systems* (IJORIS) publish the current special issue on Operation Research and its application in Transportation. The International Congress on Transportation Research is a tradition in the field of Transport in Greece enumerating a series of events which are being organized under the cooperation of the research and professional community in the field of transport, with emphasis not only on Greece but also on other countries. The transportation field is one of the most developing sectors and this explains and justifies the relevance of the proposed topics to current international research. The main objective of this special issue is to contribute to the dissemination of original and high-quality research work presented to 5th ICTR regarding the development and/or application of information systems and operation research of transportation field.

Four interesting articles are published in the current special issue. The main objective of the first article is to gain fundamental understanding on the effect of real time information acquisition, on the traffic conditions of the Athens greater area. Activity scheduling is a dynamic process, where individuals often need to modify their schedule, as a result of new insights. Research so far hasn't analyzed the effect of traffic information acquisition, in activity scheduling, although several studies have been conducted to capture

the factors that influence the rescheduling of activities. An integrated latent variable model has been estimated, that predicts the probability of rescheduling activities as a function of flexibility, mode choice constraints and travel information. The analysis of the results indicates that one of the biggest impacts of traffic information acquisition is reflected in the rescheduling of activities. Therefore, traffic information not only can significantly improve the travel experience of individuals but may directly affect the performance of the transportation system. The second published article presents a methodology that audits the bikeability level of the urban road environment across three selected routes in the city of Volos, Greece. This methodology turns to be a useful toolkit in order to evaluate and improve the bikeability level of the urban road environment and also evaluate existing bikeways. Four suitably trained auditors rode their bikes and evaluated the bikeability level using an audit tool in order to audit specific features that influence bicycling suitability across the road segments and intersections of the selected routes. This study concludes that the bikeability level of the selected routes was moderate and certain actions are necessary in order to be improved. The objective of the third research article is the analysis of pedestrians behaviour along entire trips in urban road networks, with focus on their interaction with the traffic and the road environment while crossing roads. For this purpose, a special field survey was designed and carried out, which involved the recording of pedestrians road crossing behaviour along entire trips in real time by means of camera in motion at the centre of Athens, Greece. Based on the results of the field survey, an analysis of road crossing behaviour of pedestrians is presented, concerning characteristics of the trips, the pedestrians, the road environment and the traffic conditions. The results indicate that basic parameters of pedestrian trips (i.e. trip length, walking speed, number of crossings) can be described by appropriate probability distributions. They also reveal a tendency of pedestrians to cross either in the beginning or in the end of the trip, an increased probability of crossing at signalized junctions when these are available, and increased probability of crossing at mid-block in low traffic volume and on one-way roads. Furthermore, there is an overall tendency of pedestrians cross to at mid-block when the road and traffic conditions are favourable. On the contrary, more traffic lanes and increased traffic volume appear to discourage pedestrians from accepting important interaction with the vehicles and to lead them towards the choice of protected crossing locations. Finally, the last article of this special issue studies a comprehensive framework for estimating optimal interrelations and dilemmas among emissions-related carbon footprint and other (social- and economic-related) features of urban road networks design and operation. The presented analysis is based on techniques of multi-objective and hierarchical mathematical programming with equilibrium constraints. The results of the proposed optimization methodological approach provide the Pareto Frontier of solutions, which corresponds to optimal trade-offs amongst multiple objectives. The computational experience from the application of the proposed methodological approach on a part of a realistic urban network is presented, providing evidence on the applicability as well as on the computational burden of such transportation design paradigms, but most importantly, on the dilemmas emerging in sustainable design and planning of transportation systems.

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Guest Editors

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