Editorial

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The continuous demand for good's distribution and people's mobility consists of one of the most important issues in the transport sector that must be solved. In order to satisfy these needs, decision support tools, methodologies and applications must be developed to achieve the optimal results. The issue proposes a forum to present the latest developments on the field and also address the main challenging topics of research regarding decision support systems (DSS) and transport. Further, a presentation by the guest editors that set the context and introduce the papers of the special issue is given.

Decision support tools or DSS refer to a wide range of computer-based tools (simulation models, and/or techniques and methods) developed to support decision analysis and participatory processes. Many innovative, computer-assisted ideas have been proposed to increase customer satisfaction in transportation, provide safer and more reliable transportation services, reduce costs and improve profitability of transportation activities, bring more satisfaction to employees of transportation companies, improve transportation infrastructure, better match supply and demand in the transportation sector, and many others.

The current trend in constructing the transportation-oriented DSS is to equip it in a wide range of computationally efficient tools and methods developed in scientific fields of decision sciences (DS) such as operations research (OR), statistical decision theory (SDT), system thinking (ST) or computer sciences fields such as artificial intelligence (AI) or machine learning (ML), among others. Those methods are designed to solve specific transportation problems, such as fleet assignment, vehicle routing and scheduling, fleet composition, crew assignment and scheduling, fleet replacement, fleet maintenance, terminal location, traffic assignment or modal choice, among others, and are often used for both passenger and freight transport, mainly in urban areas (Gonzalez-Feliu et al., 2018). Moreover, although classical optimisation tools aim to find an optimal or close-to optimal solutions to those problems (Zak, 2010), in last years, other approaches, mainly related to satisfaction problem solving (Ackoff, 1978), are developed, mainly using system thinking, data-driven or collaborative decision-making approaches (Gonzalez-Feliu et al., 2016).

Nowadays, transport planners cannot use traditional methods for solving ever developing problems. Instead, contributions from other fields of science, such as artificial intelligence, combinatorial optimisation, multi-actor and group decision making and advanced statistical approaches, in addition technologies, such as GIS, intelligent transport systems (ITS), internet of things (IoT) or advanced information systems (IS), among others, are the necessary tools for the transport planners (Ocalir-Akuna, 2016). All

these techniques and models can be added in the general concept of DSS which are important for the decision in the transport sector.

The issue contains researches directly related to decision support tools, methodologies and applications which imply to solve transportation problems. The issue counts six papers belonging to different contexts and disciplines, dealing with transport issues.

The first paper proposes a multi-objective vehicle routing problem (VRP) model for the delivery within the last mile of a mega city exemplified in perishable fruits. This proposal to manage perishability is that of continuous loss, to the extent that the amount of food that deteriorates is proportional to the amount transported and to the time in which it is transported, which is also affected by the distance travelled, the average speed of travel and the time spent at each stop. The paper first introduces VRP methodology and its application in food transportation. After that, it presents the methodology for data acquisition and analysis for this specific case in Bogotá-Colombia. Then, the results of the methodology application to the case study are shown, i.e., the dominant perspectives identified and a discussion of the main findings. Finally, conclusions and recommendations for further research are provided.

The second paper proposes a methodology to identify the best possible locations of intermodal terminals in order to integrate different transportation modes into the same network. To solve such a problem, taken the city of Bogota, Colombia as an exemplary case study. The approach is evaluated in terms of efficiency and efficacy, so the benefits of the application are highlighted. Although a case study is presented in this paper, the methodology can be generalised to be applied elsewhere helping the decision-making process. Firstly, this paper introduces the decision-making approach in the past and present. It also presents the location problem theory. After that, the methodology of multi-criteria decision-making is presented. This methodology (MCDM) implied in the city of Bogota-Colombia which are used as a case study. Finally, conclusions and future research are provided.

The third paper use general morphological analysis (GMA) as a theoretical framework that could support policymakers to make better decisions for a successful transition of transport to new electrical technology. The more generalised form of morphological analysis first introduced by Fritz Zwicky in the 1940s (Zwicky, 1948). It extended already successful morphologies in various fields to the ability to represent, "categorise and investigate the total set of relationships contained in multi-dimensional, non-quantifiable problem complexes" (Ritchey, 2006). The term evolved to GMA since several other scientific disciplines use this term for specific areas of study (Ritchey, 2011). As an example, the authors provide a theoretical morphological matrix, demonstrating the main paths that can be formed at different levels of abstraction. The article illustrates how GMA could make more manageable the complexity of the problem, and it concludes with recommendations on how computational calculations could further illustrate the advantages of GMA.

Another important decision support tool is the dynamic expert system. According to Liao (2015), "Expert systems provide powerful and flexible means for obtaining solutions to a variety of problems that often cannot be dealt with other more traditional and orthodox methods". Expert systems are very useful when there is a need for sophisticated multi-parameter complex and domain-specific knowledge (Giarratano and Riley, 2005), e.g., the case of shipping in the current study. The fourth paper proposes the development of a dynamic expert system which utilises highly interpretable data mining

techniques. The main objective of the system is maritime accident cause classification (human vs. non-human cause), a task achieved with high accuracy by the C5 decision tree algorithm. The research team used official maritime accident data with a timespan of over 15 years for training and testing of models. Furthermore, this paper presents the results of the developed model and discussion about those results. Finally, conclusion is provided.

The fifth paper try to identify road links and axes within an urban network, which, if selected for pedestrianisation, the overall traffic and accessibility of them would result the minimum impact. A two-level optimisation method applied in order to do so. The method is based on a unified network performance measure for calculating the criticality of network links, using the total network demand and the difference in travel time as a consequence of a link closure. This paper first introduces a literature review on pedestrinazation and the motives of their implementation. Furthermore, it presents the existing methodologies and approaches for the selection of road links subject to pedestrianisation and the methodological approach followed within this paper. Also, the outcomes of the proposed method are presented for a case study in Thessaloniki, Greece. Finally, the conclusion of the conducted research and proposed directions on future steps in the field of optimally selecting candidate pedestrian links of road networks are provided.

The sixth paper presents a three-step methodology for defining solutions of Cypriot taxi industry. This developed model is based in the third step of the traditional four-step transport model (Ortuzar and Willumsen, 1991): the mode choice. Based on the results of the abovementioned steps, the paper concludes with the development of alternative viability assessment methodologies for taxi industry and some proposals for the re-formation of taxi services including also pricing policies in Cypriot environment. Firstly, this paper presents an introduction about the operation of taxis within urban environment and then more specifically about the operation in Cyprus. Furthermore, the data acquisition for this research is presented. The methodology's framework and the developing of the model are also analysed. Finally, conclusions and policy implications are provided.

As shown above, the special issue contains a set of diverse papers on challenging topics related to decision support tools, methodologies and applications and its relationship with transport. Papers show also the importance of these DSS in all aspects of transport sector and its necessity in order to maximise the efficiency of its system.

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