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# Editorial: Persons and Freight Transportation

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## 1 Introduction

Technological evolution has been dramatic in the last decades. Collaboration and coordination opportunities in transportation have become enormous. Employing systemic approaches and advanced analytical methods to solve transportation problems is becoming even more vital than in the past. This Special Issue focuses on the recent trends in mobility of people and freight with particular attention to the aspects of sustainability and collaboration among the logistics actors. It also pays attention to the efficiency aspects related to the transportation resource utilization (ATRI, 2023). Several original and high-quality papers dealing with theoretical, methodological and applications aspects of persons and freight transportation have been received. After a rigorous reviewing process, a subset of them has been accepted for publication.

This Special Issue was organized in occasion of the International Conference on Science, Engineering Management and Information Technology held in Ankara-Turkey during the period 2-3 February 2022. The event had the aim of bringing together worldwide experts in the fields of engineering and business management and information technology and the related applications in the hope of promoting scientific exchange and discussing possibilities of further cooperation and networking. The conference was an extraordinary opportunity to encourage experts to respond to the most recent engineering and business management and IT issues and to enhance university-industry collaboration. In addition to the scientific presentations, the event provided also valuable workshops that helped young talents to be introduced to some cutting-edge research challenges.

The Special Issue aims to serve as a valuable compilation of innovative research

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contributions addressing, but not limited to, compelling topics such as optimization methods for the transportation of persons and goods, collaborative transportation in logistics (Gansterer and Hartl, 2018), shared customers in distribution networks (Antit et al., 2021), carrier assignment, auction bidding and profit sharing methods (Triki et al., 2023), vehicle routing and fleet management, sustainable solutions for the transportation of persons and goods, centralized and decentralized transportation planning, real-life applications in sustainable transportation, the role of data science, big data, data mining and knowledge management in transportation (Chowdhury et al., 2024), transportation in uncertain environment and risk management, transportation in disaster conditions, real-life applications involving a transportation contexts, etc. Besides the participants in the conference, the submission of unpublished papers was also opened to all the scholars from the worldwide community.

## 2 Selected Papers

Ten papers have been selected for this Special Issue, each accepted after a rigorous peer-reviewing process conducted by independent reviewers. The papers are listed below following the order of acceptance date (earlier first). These contributions, summarized below, explore a diverse range of topics, introduce several innovative ideas and cover numerous application contexts.

*Casté, Koch and Marenco* developed in Casté et al. (2025) a design and an implementation of a framework for addressing general instances of vehicle routing problems, integrated into a commercial vehicle tracking and routing software. They claim that implementing optimization algorithms in multi-user environments poses unique challenges compared to ad-hoc algorithms designed for specific problems. For this purpose, they proposed a single implementation that meets the diverse needs of multiple users while being capable of handling instances with varying characteristics.

*Bavar, Bavar, Gholian-Jouybari, Hajiaghahi-Keshteli and Mejía-Argueta* provided in Bavar et al. (2025) a decision support tool for the health care service providers to face several key challenges, including scheduling appointments, managing nurse and patient transportation, ensuring timely delivery of medicines to pharmacies, addressing environmental impacts, and maintaining service availability. They developed a bi-objective home health care problem that considers both transportation costs and greenhouse gas emissions. They also designed several new heuristics as well as hybrid versions of recent and well-established metaheuristic algorithms to solve the problem effectively.

*Diri Kenger, Nedim Kenger and Özceylan* performed in Diri Kenger et al. (2025) a bibliometric and social network analysis of urban and public transportation literature that uses the Analytic Hierarchy Process (AHP) technique. The analyses were conducted to objectively identify trends and highlight key insights in a systematic and scientific manner. The results of their analysis indicated that hybrid methodologies (such as AHP-TOPSIS and Fuzzy AHP) are frequently utilized in the reviewed publications. The AHP technique has been widely applied to areas such as service quality evaluation, bus and vehicle selection, facility location determination, passenger satisfaction, and bus-bicycle route planning. They also highlighted the importance of (i) achieving sustainable urban transportation which requires the adoption of smart and eco-friendly technological solutions, (ii) integrating multiple transportation modes to ensure the safety and sustainability of urban transit systems and (iii) prioritizing public transportation vehicles powered by clean technologies that can significantly contribute to healthier and more

livable cities.

*Goli, Babaee Tirkolae, Golmohammadi, Atan, Weber and Ali* designed in Goli et al. (2025) a flexible, sustainable, multi-product, multi-period supply chain network. Their approach incorporated an Internet-of-Things (IoT)-based system and an integrated forward/reverse logistics structure. Flexibility is introduced by enabling direct shipments from manufacturing plants or distribution centers to customers. To manage both direct and indirect deliveries simultaneously, an IoT-based transportation system was utilized. The supply chain configuration was modeled as a multi-objective mixed-integer linear programming formulation, which was subsequently transformed into a single-objective model using the goal programming method. Moreover, the authors developed a robust optimization approach to address the stochasticity in the demand parameters, ensuring the system's resilience to variability while maintaining performance.

*Lotfi, Hazrati, Ali, Sharifmousavi, Khanbaba and Amra* focused in Lotfi et al. (2025) on designing a framework of a healthcare waste chain network, comprising key components such as health centers, waste segregation units, waste purchase contractors, and landfills. A novel robust stochastic optimization approach was proposed, integrating the entropic value at risk to address the stochastic variant of the problem including the risk disruptions effects and the fluctuations in demand patterns. Additionally, the study incorporated principles of antifragility, sustainability, and agility into the healthcare waste chain network framework. This was achieved through the inclusion of blockchain technology, flexible capacity, gas emissions, energy consumption, and population risk constraints, enhancing the network's adaptability and efficiency.

*Hamdan, Hamdan, Benbitour and Jradi* discussed in Hamdan et al. (2025) the concept of fairness in transportation systems that allows drivers to be treated equitably and to get equal opportunities. More specifically, the authors developed a bi-objective mixed-integer programming problem that maximizes profit while enhancing fairness among drivers by minimizing the maximum deviation from the average driving time. To solve the problem, they applied the weighted comprehensive criterion method and developed an iterative population-based heuristic. Additionally, they analyzed the "fairness price" defined as the relative difference in total profit with and without incorporating fairness.

*Karakostas and Sifaleras* are the authors of the article Karakostas and Sifaleras (2025) in which they presented a multi-period, multi-commodity inventory-routing problem that incorporated strategic fleet scheduling decisions. They also accounted for the restrictions related to the speed limits and strict European Union regulations on truck drivers' working and driving time. The authors proposed a mixed-integer linear programming model and validated its performance on multiple artificially generated (yet realistic) problem instances. Additionally, to provide valuable managerial insights, extensive sensitivity analyses were conducted to examine the effects of varying fluctuation rates on key model parameters.

*Yalçın and Ayyıldız* discussed in Yalçın and Ayyıldız (2025) how to prioritize factors such as reliability, collaboration, sustainability and cost in the carrier selection process using the Best Worst Method. By drawing from existing literature, industry insights, and stakeholder input, a set of criteria is identified. The developed approach is used to create a structured evaluation framework where expert judgments and pairwise comparisons are utilized to determine the "best" and "worst" criteria for each factor, assigning relevant priority weights. The findings indicated that the cost is the most important factor in the decision-making process. The results also highlighted that cost, reliability, and safety are the key priorities in freight carrier selection, while sustainability and collaboration, though still important, are of lesser priority.

*De Maio, Ohlmann, Stoia and Vocaturo* explored in De Maio et al. (2025) new delivery methods supported by information and communication technologies to face the growing demand for home deliveries fueled by the rise of online shopping. The authors examined a dispatch platform that combines the employment of a fleet of vehicles together with in-store customers who are willing to act as crowdshippers. The collaborative platform aggregated the incoming orders and schedules the routing for product pickups at stores and deliveries to customers. The study took also into account the dynamic and stochastic nature of the problem through the use of a Markov decision process. A real-time insertion method was also implemented to manage the random availability of vehicles and crowdshippers.

*Grosso-delaVega, Muñuzuri and Escudero-Santana* discussed in Grosso-delaVega et al. (2025) a challenging real-life large-scale distribution problem. The concerned company supplies goods to public schools and operates a fleet of vehicles from a central depot. The problem exhibits several challenging features such as access restrictions to customers, the need for service from multiple vehicles, and time windows for deliveries. The primary objective is to minimize transportation costs. To tackle this unique challenge, the authors proposed a novel formulation of the Rich Vehicle Routing Problem with zone-dependent transportation costs. The developed approach consists of implementing and testing a combination of GRASP heuristic and tabu search algorithms. The validation process against actual operational data, achieved significant reductions in transportation costs and improved vehicle utilization while ensuring a more sustainable management.

### 3 Conclusions

The guest editors wish to express their gratitude first to *Prof. Ulrike Leopold-Wildburger* the Editor-in-Chief of the Central European Journal of Operations Research (CEJOR) for this opportunity to publish this valuable collection of articles. They would also like to thank all the contributors as well as the many anonymous referees for ensuring high quality standards during the reviewing process of the submitted papers.

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