



New scenarios for transport systems: transition to inclusivity, resilience and sustainability

Giuseppe Cantisani¹, Michela Le Pira^{2*}, Stefano Zampino³

¹AIIT Director of Studies and Research Center, Associate Professor of Roads, Railways and Airports, University of Rome "La Sapienza", Italy

²TIS ROMA 2022 Scientific Committee Member, Research Fellow and Lecturer of Transport Planning, University of Catania, Italy

³TIS ROMA 2022 Conference Coordinator

³AIIT President, Head of the Unit Regulations and Technical Standards ANSFISA - National Agency for Safety of railways and road and motorway infrastructures, Italy

Editorial

Transport systems are in a period of a transition. First, there is the urgency to achieve transport decarbonisation and, in general, sustainable mobility (Banister, 2019). In parallel, the events of the last years, especially COVID-19 pandemic, have posed significant challenges on transport systems that are likely to lead to structural changes in transport demand (Das et al., 2021). Besides, technological innovations enabling new Mobility on Demand services and concepts like MaaS (Mobility as a Service) are also responsible of a restructuring of both transport demand and supply towards personalized and on-demand services (Shaheen and Cohen, 2020, Le Pira et al., 2021).

New scenarios for transport systems are therefore needed to reach *inclusivity, resilience and sustainability*. This is the rationale of the special issue that stems from the AIIT 3rd International Conference on Transport Infrastructure and Systems (TIS ROMA 2022), which was held in Rome on 15th-16th September 2022 (<https://tisroma.aiit.it/>). The conference was organized by AIIT, the Italian Association for Traffic and Transport Engineering, and hosted by ACI, Automobile Club d'Italia.

TIS Roma 2022 aimed at exploring and discussing the new foreseeable conditions and constraints for transport systems and infrastructures to better address the future policies and strategies. It provided a forum for discussion, interactions and exchange among researchers, scientists and engineers whose fields of interest concern transport and infrastructure engineering.

Two Keynote Speakers discussed their perspectives related to new scenarios for transport infrastructures and systems. Rik Nuytens, President of European Union Road Federation (ERF) discussed the presentation titled: "A fast road to a better future?", while Maria Attard, Professor in Transport Geography, head of Department of Geography and

* Corresponding author: Michela Le Pira (michela.lepira@unict.it)

manager of the Institute for Climate Change and Sustainable Development at the University of Malta, spoke about: “Active travel: achieving sustainability, resilience and inclusivity”.

During the two days of the conference, 140 papers were presented in 21 parallel sessions and 2 special sessions focused on innovations in last mile logistics.

All the papers were peer-reviewed before being approved for presentation at the conference.

Based on the results of the review process, 19 papers were selected to be included in two special issues of “European Transport \ Trasporti Europei”.

The present special issue focuses on “New scenarios for transport systems: transition to inclusivity, resilience and sustainability”. It is composed by 9 papers that cover many topics and issues related to transport systems, from maritime transport and port-city relation, to digitalization and electric mobility in urban contexts, to new transport solutions, like hyperloop, but also gender perception of active mobility and the importance of monitoring transport infrastructures with increasing transport loads.

More in detail, Gianfranco Fancello, Patrizia Serra and Daniel Mark Vitiello with their paper titled “*A Port Accessibility Index for Mediterranean container terminals*” focus on maritime transport and ports. They define a Port Accessibility Index (PAI) and apply it to Mediterranean container ports considering the internal accessibility of the port. The analysis performed can be helpful for decision-makers when carrying out management strategies, considering the strategic role that ports have in the global supply chain and in the economic development of our cities and the challenges they faced during the last years.

Michela Le Pira, Martina Fazio, Nadia Giuffrida, Giovanni Calabrò, Giuseppe Inturri and Matteo Ignaccolo focus on the topic of MaaS, by proposing a digital application capable of providing transport (and other) services offered to university communities in their paper titled “*UaaS App – University as a Service App: exploring the acceptability of a MaaS-like concept for a University community*”. They explore the acceptability and willingness to use the application by interviewing potential users belonging to the University of Catania (Italy). The analysis performed allowed to derive useful information on the target users of a MaaS-like service for a University community, which can be important to foster the use of sustainable transport modes for home-to-University trips.

Riccardo Ceccato and Massimiliano Gastaldi presents a study on innovations in urban freight transport titled “*Last mile distribution using cargo bikes: a simulation study in Padova*”. They aim at addressing the consequences of the recent growth of e-commerce with an increasing freight demand, by proposing the use of cargo bikes for last mile deliveries. They set up a procedure and tested it in the case of the city centre of Padova (Italy), comparing deliveries performed by traditional vans with those performed by manual and electric cargo bikes starting from a micro-depot. Results highlight the potentiality of cargo bikes as a sustainable delivery system and pave the way for further research on urban freight transport towards sustainability.

The paper by Laura Eboli, Carmen Forciniti, Gabriella Mazzulla titled “*How young pedestrians perceive walkways: gender differences*” addresses the important topic of

active mobility. They present the results of a Stated Preferences (SP) survey aimed at collecting pedestrians' perceptions about path characteristics and addressed to a sample of 240 Italian university students. Mixed logit models are calibrated starting from the data collected and results highlight how women and men perceive differently some walkway characteristics, pointing to the need to focus more on gender issues in transport research and practice.

Piero Macaluso, Angela Carboni, Cristiana Botta, Paolo Lazzeroni, Francesco Deflorio and Maurizio Arnone address the topic of electric mobility in their paper titled ***“Estimating charging demand by modelling EV drivers' parking patterns and habits”***. They focus on parking demand of battery electric vehicles (BEVs) and propose an agent-based model to represent parking activities in urban areas to obtain key indicators of the electric energy required. The model is applied to the city of Turin and allows to identify zones where charging demand can be critical and peak events in electric power over the day. The model could be adapted to other cities and can be useful for policy-makers to tackle future transport scenarios based on electric mobility.

The paper ***“Bridge's vehicular loads characterization through Weight-In-Motion (WIM) systems. The case study of Brescia”*** by Roberto Ventura, Benedetto Barabino, David Vetturi and Giulio Maternini deals with the negative impact of the growing traffic flow and the increase in transported masses on bridges using Weigh-in-Motion (WIM) systems. A statistical analysis is performed using raw WIM data collected on a main bridge near the city of Brescia (Italy) identifying different clusters of vehicles. The paper highlights the need of improving enforcement in Italy given that axle mass limits violations are noteworthy among mass exceptional vehicles.

The technical and economic feasibility of hyperloop systems is investigated in the paper by Fabio Borghetti, Federico Ursino, Michela Vischi and Roberto Maja titled ***“Preliminary technical and economic analysis of a hyperloop line: case study from Italy”***. The Authors specifically focus on transport demand analysis with an SP survey, on the transport sizing of the infrastructure and on the cost analysis of CAPEX - CAPITAL EXpenditure and OPEX - OPERating EXpense. The methodology is applied to a case study in Italy of the Rome-Milan OD (Origin – Destination), as it is one of the national routes with the highest volume of traffic and the largest number of modal choices and can be useful to design future transport scenarios with hyperloop systems.

Marina Zanne and Elen Twrdy present a study titled ***“Improved port gate procedures for a better port-city relation”***. The important relation between port and cities is addressed by focusing on the effectiveness of various procedures and upgrades at the port gates that can improve the gate turnaround times. The case study of the port of Koper is analysed, by quantifying the current negative impacts of port-related road congestion and the benefits of introducing selected measures at the gates of the port.

The results are important for a better understanding of the complex port-city relation and to propose solutions towards sustainability.

All papers present innovative researches and provide different perspectives on new scenarios for transport systems, by describing new approaches and testing them to relevant case studies. The knowledge built upon the papers of the special issues and,

overall, on the papers presented at the conference pave the way for future research that is needed to tackle new and old transport planning challenges and lead to transport inclusivity, resilience and sustainability.

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