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Journal of Land Use, Mobility and Environment

The climatic, social, economic and health phenomena that have increasingly affected our cities in recent years require the identification and implementation of adaptation actions to improve the resilience of urban systems. The three issues of the 16th volume will collect articles concerning the challenges that the complexity of the phenomena in progress imposes on cities through the adoption of mitigation measures and the commitment to transforming cities into resilient and competitive urban systems.

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The cover image shows a copy of the 1987 UN report “Our Common Future – The report of the world Commission on Environment and Developments”. The picture has been taken in TeMA Lab in July 2023. On the bottom, there is a collage made up of four pictures of recent climate disasters (Source: Google images)

TeMA. Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include: engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science and complex systems.

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REVIEW NOTES – Urban planning literature review

New frontiers for sustainable mobility: MaaS (Mobility as a Service)

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Abstract
Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always remaining in the groove of rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of continuously updating emerging topics concerning relationships between urban planning, mobility and environment, through a collection of short scientific papers written by young researchers. The Review Notes are made of four parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal.
In particular, the Urban planning literature review section presents recent books and journals on selected topics and issues within the global scientific panorama.
This contribution aims at delving into the issue of sustainable urban mobility through a new mobility paradigm represented by MaaS (Mobility as a Service). Effective and sustainable management of urban transportation activities and services plays an important role within the city to reduce environmental impacts and improve the quality of life for citizens. For the second issue of TeMA Journal, volume n.16, this Review Notes section offers a literature overview on the main aspects of MaaS and its impact on the urban mobility system. It analyzes the potential sustainability benefits of using MaaS in the urban context by citing some interesting and significant journals and books which delved into the topic.

Keywords
MaaS; Mobility as a Service; Urban mobility.

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1. Introduction

United Nations in The Report on the Sustainable Development Goals 2022 states that "Today, more than half the world's population live in cities. By 2050, an estimated 7 out of 10 people will likely live in urban areas. Cities are drivers of economic growth and contribute more than 80 per cent of global GDP. However, they also account for more than 70 per cent of global greenhouse gas emissions. If well-planned and managed, urban development can be sustainable and can generate inclusive prosperity" (UN, 2022).

The evolutionary process of urban phenomena is also connected to the growing demand for mobility and thus traffic flows. The Global Mobility Report 2017 (Sustainable Mobility for All, 2017) mobility will progressively grow with more and more people and goods moving through cities and around the world. By 2030, annual passenger traffic will reach over 80 trillion passenger-kilometres, a 50 percent increase from 2015; in addition, the number of vehicles on the road will reach 1.2 billion, double compared to the current total.

However, fulfilling growing demands for mobility has the potential to contribute to environmental degradation and increase air pollution levels in cities as well as amplify the effects of climate change. Therefore, urban mobility has a considerable impact on sustainability and quality of life in cities.

Although mobility offers many benefits to users, we cannot ignore the costs it entails for our society: greenhouse gas emissions, air, soil and water pollution, as well as road accidents, congestion of traffic and the loss of biodiversity. All of these factors have a significant impact on our health and well-being. (EU, 2021). The fuels used for transport generate over 50% of the nitrogen oxides emitted globally which, added to the particulate matter, together constitute a significant threat to human health, especially in urban areas. (Fenu, 2021; World Energy Investment, 2017; Watts et al., 2019).

To promote the growth of ecological consciousness and stimulate a new perspective in the way the world is designed, it is necessary to adopt principles, values and processes that include additional issues to traditional ones, such as the environmental, social and economic impact of proposed solutions (Spadaro I. et al., 2022; Beatly, 2015). Only through conscious and responsible planning can we create a sustainable future for everyone.

The study of sustainability in combination with urbanization has led to the concept of the sustainable city which has become of interest in multiple sectors including research, education, policy making and business (Höjer & Wangel, 2015).

Sustainable transportation and mobility are critical to realizing the promise of the 2030 Agenda for Sustainable Development, particularly to achieve the vision of the city by 2030 proposed by Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable" (UN, 2015).

In recent years, automobile-centered policy has caused an increase in negative externalities in the urban environment, so a change of course is underway, and developments in digitization and technology are helping in this process. The shift from car ownership to shared mobility and the transition of combustion engines to electric are just some of the concrete examples of this evolutionary process in urban mobility.

Just as in the past the mass introduction of the automobile changed people's way of life, new technologies are transforming the traditional idea of mobility into the new concept of "smart mobility" (Tirachini, 2020; Docherty et al., 2018). Clean mobility and soft mobility, combined with greater accessibility and the ability to obtain real-time information, provide savings in time, economic and environmental costs and make the transport system "smart" and efficient (Pellicelli G. et al., 2022; Niglio & Comitale, 2015). Autonomous vehicles and sharing services are among the innovations in the transport field that can be linked to the concept of "as a service", describing a new paradigm in which mobility is no longer based on private vehicle ownership but rather accessible on demand (Wong Y. Z. et al., 2020).

The panorama of urban mobility is rapidly evolving and citizens are gradually being offered multiple solutions, this has the consequence that it may not be easy for the user to choose the best way to travel (UITP, 2019).

The double challenges of multimodality and decarbonisation have led to the spread and integration of traditional and new mobility services such as public transport, ride-sharing, car-sharing, bike-sharing, scooter-sharing, taxi, car rental, ride-hailing ed so on. In the urban transport sector, the digital revolution and the ambition to significantly reduce traffic congestion and pollution through the integration of mobility services has led to the emergence of the MaaS (Mobility as a Service).

In the academic world, the acronym MaaS was born only recently and the first application of Mobility as a service dates back to 2016, in Finland, with the launch of the "WHIM" app. MaaS, a consequence of the digital revolution, has become an element of discussion in the urban transport sector (CERRE, 2021).

A first consensual definition among public and private organisations was provided in 2017 by the White Paper of the MaaS Alliance in which MaaS is defined as "the integration of various forms of transport services into a single mobility service, accessible on demand. For the user, MaaS offers added value using a single application to provide access to mobility, with a single payment channel instead of multiple ticketing and payment operations" (MaaS Alliance, 2017).

Mobility as a Service enables customers to meet and manage all their mobility needs on demand, according to their specific requirements. The service is based on the seamless integration of all the different modes of public and commercial transport and is provided to the user through a single digital channel (web site or app). MaaS allows multimodal travel choices, from planning, booking to payment and eventual route modification. MaaS also ensures that relevant authorities to collect data and information on demand and travel behavior that can be used to improve mobility services and plan infrastructure investments (EMTA, 2019).

MaaS requires a business system in which different groups of actors interact and collaborate: there are the platform owners (e.g., third parties, transportation service providers, authorities), on the demand side there are the users requesting the mobility services, and from the supply side the transportation service providers (public or private).

The MaaS model sees the involvement of multiple actors who can cooperate to enable the operation of the service and improve its efficiency, including local authorities, payment clearing companies, telecommunications and data management (Jittrapirom P. et al., 2017).

From the user's perspective, MaaS provides more personalized mobility options and services to meet the individual needs of users, offering on-demand, flexible, and affordable services that can push the user toward moving away from private car use, making more conscious, multimodal and sustainable mobility choices.

MaaS is a user-centric system so it takes into account the user's general preferences such as speed, convenience, comfort, costs, presence of luggage, without neglecting the special accessibility needs of some fragile users (ERTICO, 2019).

From the transport operator's point of view, MaaS offers its travelers a wide range of mobility services that can attract a wider portion of the market and users. "It is clear that any business actor in the MaaS ecosystem will pursue the goal to grow his business" (UITP, 2019).

From a city authority's point of view, MaaS can become a tool to improve the livability of urban environments: by offering more efficient and coordinated mobility services, to reduce the volume of car traffic, noise and air pollution, to solve the parking problem and to also revise street and urban space design in a way to promote active mobility and intermodal mobility.

Sustainable, innovative and integrated mobility becomes a priority for authorities who want to promote a transition towards cities with a good quality of life. It is estimated that 74% of Europeans live and move in cities every day, and urban mobility i accounts for 40% of total CO_2 emissions in the transport sector (Spadaro I. et al., 2022, Diez J.M. et al., 2018). The environmental and social component of sustainability must be a priority objective of MaaS, including equity and accessibility as essential elements (Nykanen, 2017).

Although some examples of MaaS exist and a few pilot projects have been conducted with generally positive results, so far progress and large-scale implementation are rather slow. As a result, little empirical evidence

remains on whether or not MaaS meets expectations (Karlsson, 2020). The reasons for the limited deployment of MaaS can be attributed to various reasons including legislative gaps, difficulty in coordinating multiple actors, infrastructure gap between different urban areas, data sharing, lack of funding, business models and so on.

In conclusion, MaaS is a new global concept of mobility which involves the integration of multiple public and private transport services accessible through a single digital channel. This new mobility paradigm offers services aimed at meeting user needs while at the same time enabling the promotion of political and social goals, such as sustainability and accessibility. The use of MaaS in the urban context can bring numerous benefits, including better organization of mobility services and optimization of the design and distribution of urban space. Promoting the implementation of MaaS pilot projects is a valuable tool for increasing the efficiency of services and assessing their impact on the environment and socioeconomic contexts. The experiments can thus provide important guidance to relevant authorities on mobility management choices, facilitating the adoption of MaaS in the future as a means of shifting to more sustainable modes of transportation for a more livable urban system.

Big Data and Mobility as a Service

Authors/Editors: Haoran Zhang, Xuan Song & Ryosuke Shibasaki
Publisher: Elsevier
Publication year: 2022
ISBN code: 978-0-323-90169-7

"Big Data and Mobility as a Service" explores MaaS platforms that can be adaptable to the ever-evolving mobility environment. It looks at multi-mode urban crowd data to assess urban mobility characteristics, their shared transportation potential, and their performance conditions and constraints.

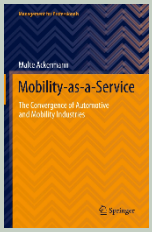
The book analyzes the roles of multimodality, travel behavior, urban mobility dynamics and participation. Combined with insights on using big data to analyze market and policy decisions. Big data-driven MaaS development is an emerging area both in academic and industrial aspects. Though several research studies and technical reports are available, a clear link to understand big data in MaaS appears vague and fragmented. This book aims to fill this gap by systematically summarizing the knowledge in this field. Collectively, the knowledge in this book is of immense significance for stakeholders in MaaS and those planning to enter the industry, such as researchers, engineers, operators, company administrators, and policymakers in related fields, to comprehensively understand current technology infrastructure knowledge structures and limitations.

Automated Vehicles and MaaS: Removing the Barriers

Authors/Editors: Bob Williams
Publisher: John Wiley & Sons
Publication year: 2021
ISBN code: 9781119765349

"Automated Vehicles and MaaS: Removing the Barriers" is a topical overview of the issues facing automated driving systems and Mobility as a Service, identifies the obstacles to implementation and offers potential solutions. Written in a clear and accessible style, this timely volume summarizes recent research studies, describes the evolution of automated driving systems and MaaS, identifies the barriers to their widespread adoption, and proposes potential solutions to overcome and remove these barriers. The text focuses on the claims, realities, politics, new organizational roles, and implementation problems associated with CAVs and MaaS—providing industry professionals, policymakers, planners, administrators, and investors with a clear understanding of the issues facing the introduction of automated driving systems and MaaS. The book is an essential resource for transport providers, vehicle manufacturers, urban and transport planners, students of transportation, vehicle technology, and urban planning, and transport policy and strategy managers, advisors, and reviewers. computing techniques.

Mobility-as-a-Service
The Convergence of Automotive and Mobility Industries



Editor: Malte Ackermann
Publisher: Springer Cham
Pubblication year: 2021
ISBN code: 978-3-030-75589-8

"Mobility-as-a-Service" analyzes MaaS (Mobility-as-a-Service) from an automotive industry viewpoint, considering the context of business, social, political and generational changes affecting the future of the sector and mobility. In addition, strategic tips are provided that are indispensable for the automotive industry.
The advent of mobility-as-a-service and the disruption of the automotive industry are both overlapping and fuelled by the same developments and thus raise a very fundamental question: are we at peak car? Based on the author's extensive field research, academic study, and professional experience, this book explores this very question as well as the underlying social, economic, generational, and regulatory changes that lead to a new mobility regime. Through rich descriptions of established OEMs and mobility start-ups, it discusses the current forms of mobility and the promise of autonomous technology. It further explores the strategic dimension of these developments so as to navigate and succeed within the disruptive and ever-changing environment of mobility services.

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