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Living and Walking in Cities

New challenges for sustainable urban mobility

This Special Issue intended to wonder about the new challenges for sustainable urban mobility, aligning with the European Sustainable & Smart Mobility Strategy. Contributions come from selected papers of the XXVI International Conference "Living and Walking in Cities" and have been collected around two main topics: the relationship between transport systems and pedestrian mobility and the transformative potential of temporary urban changes. Reflections and suggestions elaborated underline a collective great leap forward to reshaping urban mobility paradigms.

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Living and walking in cities: new challenges for sustainable urban mobility

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Cover photo: Herrengasse street in Graz (Austria), baroque pedestrian avenue and centre of public life, provided by Michela Tiboni (June, 2024)

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Living and walking in cities: new challenges for sustainable urban mobility

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EDITORIAL PREFACE

Special Issue 3.2024

Living and walking in cities: new challenges for sustainable urban mobility

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In recent decades, addressing urban mobility and liveability has become increasingly urgent due to environmental concerns, rapid urban growth, and evolving mobility needs. The continuous expansion of cities and the development of new technologies call for innovative solutions that can improve the city organisation by guaranteeing safe, efficient, lively, and environmentally friendly urban transport systems. The "Living and Walking in Cities" (LWC) Conference, held biennially, traditionally deals with urban mobility and quality of life in urban areas, emphasising vulnerable road users' accessibility and safety (Pezzagno & Tira, 2018; Tira et al., 2020; Maternini et al., 2021; Gargiulo et al., 2022; Maternini et al., 2024). The Conference is a platform for researchers, experts, administrators, and practitioners to discuss policies, best practices, and research findings from several perspectives. Therefore, it exemplifies the global commitment to scientific dialogue in solving urban mobility challenges.

This TeMA Journal Special Issue, inspired by the themes of the 26th LWC Conference, takes up the focus on "New Challenges for Sustainable Urban Mobility", aligning with the European Sustainable & Smart Mobility Strategy, which aims to reduce transport-related GHGs by 90% by 2050 (European Commission, 2020) and underlining a collective great leap forward to reshaping urban mobility paradigms. Therefore, the special issue aims at enriching the scientific and practical debate by addressing theories, empirical insight, methodologies, experiences, and techniques related to policy issues, best practices, and research findings. The volume includes fifteen articles, exploring multifaceted aspects of urban mobility and liveability, grouped into two primary thematic clusters.

The first cluster of articles examined the relationship between transport systems and pedestrian mobility, investigating various aspects and paradigms of accessibility, policies and the significance of mobility in an era of emergencies. It also delves into urban planning, emphasising the governance of urban and regional transformations in order to achieve more active and sustainable urban mobility while considering social and temporal implications.

In this context, Spadaro & Pirlone (2024) explored the intersection of mobility, participation, and sustainable regeneration in urban projects. Utilising the 4-helix innovation framework involving citizens, universities, companies, and administrations, the authors emphasised participatory policies for sustainable urban mobility. The study focused on the Liguria Region (Italy), which included case studies from Prà-Palmaro waterfront, Busalla, and Albisola Superiore. The approach showed the relevance of collaboration in creating resilient, sustainable urban environments. Fusi & Tiboni (2024) focused on the integration of urban and transport

planning in medium-sized cities. The authors demonstrated how the strategic urban planning tools can combine design and operational layers to enhance urban mobility. The results for the Brescia (Italy) case study showed the feasibility and benefits of integrated planning approaches, emphasising the relevance of aligning urban and transport planning to improve sustainable mobility. Moretti & De Lotto (2024) investigated the relationship between land use and CO₂ emissions from road transportation in the Province of Pavia, by using the INEMAR inventory. By evaluating the inter-scalar relationship between the Province and the Municipal scales, the article provided insights into land use influences on pollution levels, i.e., the impact of urban density and traffic flows on pollution. The methodology is based on the integration of geographical data and emission factors, to propose strategies for reducing emissions through integrated mobility systems and sustainable urban planning, so fostering the mitigation of climate change.

Further exploring accessibility paradigms. Pellicelli et al. (2024) proposed a protocol to assess smart and active mobility in urban regeneration projects. As applied to medium-sized cities in Emilia-Romagna (Italy), the protocol identified and applied specific indicators to measure the impact of regeneration on mobility and accessibility. The study set up the guidelines for integrating active and smart mobility into urban regeneration processes, emphasising the potential of these approaches to revitalise medium-sized cities. Pantaloni et al. (2024) developed a method for assessing the proximity, accessibility, and usability of green spaces, aiming at maximising cultural ecosystem services. The method integrated traditional spatial planning tools with ecological performance approaches, by associating ecological and socio-demographic data. As a result, the authors provided guidelines to support public administrations in enhancing green space distribution and developing a Green Infrastructure strategy. Türken & Conticelli (2024) explored how new technologies affect pedestrian walking behaviour. The authors reviewed traditional and innovative tools, such as GPS, GIS, video analysis, and machine learning, analysing their integration and effectiveness. The results showed advantages, limitations, and potential improvements in digital tools for improving data collection and analysis, supporting walkability assessments, and enhancing walking experiences.

Addressing the theme of mobility in an era of emergencies, Nifosì et al. (2024) developed an "Atlas of Coastal Roads" to address climate change vulnerabilities and opportunities for adaptation in Italy's coastal regions. The Atlas integrated quantitative and qualitative indicators to assess geophysical, climatic, and socio-economic risks. By providing a trans-scalar tool, the research aimed at guiding stakeholders in developing tailored adaptation strategies to enhance coastal infrastructure resilience and to support socio-ecological transitions.

The second cluster of articles focused on the transformative potential of temporary urban changes and the concept of the 15-minute city. It explored how short-term interventions can lead to permanent improvements in urban mobility and public spaces, emphasising accessibility, walkability, and the integration of transport and urban planning principles. The primary focus is on public space planning and design, encouraging social uses and the adoption of healthier lifestyles and addressing social and spatial equity for active mobility.

Rainieri et al. (2024) examined the role of active mobility in promoting social sustainability. Using a Rapid Evidence Assessment method, the study reviewed how active mobility impacts on social sustainability, particularly its alignment with Sustainable Development Goals (SDGs). The research findings highlighted how some variables influence active mobility and its benefits, such as reduced traffic congestion, improved air quality, and enhanced social equality, and provided a comprehensive framework for future research and policy development. Bianchi & Moscarelli (2024) delved into the redesign of school squares to promote public and outdoor activities. The authors proposed a methodology for classifying and redesigning school squares to enhance public utility. Analysing over 600 school squares in Milan, Turin, and Varese, the study categorised them into four typologies and suggested guidelines for interventions to improve each type. Similarly, Rossetti et al. (2024) introduced a GIS-based methodology to assess walkability in school vicinities. The authors developed a School Walkability Index (SWI) for 21 schools, identifying areas with low walkability and pinpointing critical issues. By analysing pedestrian catchment areas within 3, 10, and 15-minute walking distances, the research provided valuable insights for public administrations to improve school accessibility and enhance the surrounding public spaces.

Shifting the focus to the transition from temporary to permanent urban changes, some articles explored how short-term interventions can lead to lasting improvements in urban mobility and public spaces. Staricco et al. (2024) analysed street experiments of temporary pedestrianisation projects in Turin (Italy) as part of the Torino Mobility Lab. Since street experiments aimed at promoting active mobility by reallocating road space, the study focused on the monitoring and evaluation process to identify barriers and factors that influence the transition from temporary to permanent, sustainable urban mobility solutions, e.g., pedestrianisation. The results emphasised the potential of public participation and adaptive urban planning in achieving long-term urban transformations. Boglietti et al. (2024) explored the use of tactical urbanism as a strategy for climate change adaptation. Analysing the "SpaziAttivi" project in Brescia (Italy), the study outlined the methodological process for selecting areas for intervention, emphasising the importance of community engagement and participatory design in creating resilient urban environments. Key outcomes included the enhancement of urban microclimates and the promotion of sustainable mobility.

Further exploring the time-space design for the X-minute cities. Guaiani (2024) examined the reuse of urban spaces designed for automobiles by comparing historical, car-dependent, and sustainable city models. The study analysed the cases of Venice, Urbino, Milan's San Siro quarter, and Bologna's Pilastro quarter to illustrate how different urban forms impact on mobility. By integrating spatial and temporal dimensions, the article identified design principles for transforming car-dominated areas into walkable, sustainable environments, emphasising the importance of polycentric urban structures and mixed land uses. Sezer et al. (2024) applied the principles of Transit-Oriented Development and the 15-minute city concept in Palermo's rail station areas. The methodology combined qualitative and quantitative indicators to assess accessibility and urban quality, i.e., assessing social, functional, and environmental features of two station vicinities. The results highlighted the potential for TOD and 15-minute city synergies to enhance public transport efficiency and reduce car dependency, promoting sustainable urban mobility. Mazzola & Bove (2024) assessed the role of sustainable mobility in urban regeneration through the "GBC Quartieri protocol" and focused on the neighbourhood named Le Albere in Trento (Italy). The article examined the integration of mobility solutions like cycling infrastructure, public transport access, and pedestrian pathways. The results highlighted the relevance of mobility in achieving sustainable urban development and provided recommendations for enhancing connectivity and reducing environmental impacts in new urban districts.

In conclusion, this special issue provides a comprehensive and in-depth overview of the challenges and solutions for sustainable urban mobility, promoting scientific dialogue and practical innovation to improve the quality of life in cities.

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References

- Bianchi, F. & Moscarelli, R. (2024). Redesigning "school squares" for a public city. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 129-148. <http://dx.doi.org/10.6092/1970-9870/10913>
- Boglietti, S., Nota, M. & Tiboni, M. (2024). The exploration of tactical urbanism as a strategy for adapting to climate change. The "SpaziAttivi" program in the city of Brescia. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 169-180. <http://dx.doi.org/10.6093/1970-9870/10920>
- Fusi, M. & Tiboni, M. (2024). Urban and transport planning integration. A case study in a mid-size city in Italy. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 23-41. <http://dx.doi.org/10.6093/1970-9870/10914>
- Gargiulo, C., Maternini, G., Tiboni, M. & Tira, M. (2022). New scenarios for safe mobility in urban areas. *TeMA - Journal of Land Use, Mobility and Environment*, 3-5. <https://doi.org/10.6093/1970-9870/8916>

- Guaiani, A. (2024). Urban forms interpretation for the car-era spaces reuse. A comparison of walking, automobile, and sustainable cities. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 181-195. <http://dx.doi.org/10.6093/1970-9870/10916>
- Maternini, G., Tiboni, M. & Tira, M. (2021). New Scenarios for Safe Mobility in Urban Areas. *European Transport|Trasporti Europei*, 85, <https://doi.org/10.48295/ET.2021.85.0>
- Maternini, G., Pezzagno, M., Tiboni, M. & Tira, M. (2024). New challenges for sustainable urban mobility. *European Transport|Trasporti Europei*, 97, <https://doi.org/10.48295/ET.2024.97.0>
- Mazzola, E. & Bove, A. (2024). Proposal of a methodology to analyze the role of mobility in sustainable urban regeneration. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 215-228. <http://dx.doi.org/10.6093/1970-9870/10422>
- Moretti, M. & De Lotto, R. (2024). Methodologies for estimating emissions from road transport and comparison with the inventory Air Emissions (INEMAR): the case of Pavia Province. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 43-51. <http://dx.doi.org/10.6093/1970-9870/10932>
- Nifosì, C., De Angelis, F., Choubassi, R., Gorrini, A. & Messa, F. (2024). Coastal roads atlas. Reshaping daily infrastructures for coastline adaptation. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 97-111. <http://dx.doi.org/10.6093/1970-9870/10917>
- Pantaloni, M., Botticini, F. & Marinelli, G. (2024). Assessment of urban green spaces proximity to develop the green infrastructure strategy. An Italian case study. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 67-81. <http://dx.doi.org/10.6093/1970-9870/10919>
- Pellicelli, G., Rossetti, S. & Zazzi, M. (2024). A smart and active mobility assessment protocol for urban regeneration. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 53-66. <http://dx.doi.org/10.6092/1970-9870/10910>
- Rainieri, G., Carra, M., Richiedei, A. & Pezzagno, M. (2024). Evaluating active mobility: enhancing the framework for social sustainability. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 113-128. <http://dx.doi.org/10.6093/1970-9870/10912>
- Rossetti, S., Caselli, B. & Torrisi, V. (2024). Towards more walkable streets. An assessment method applied to school areas in Parma. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 149-158. <http://dx.doi.org/10.6093/1970-9870/10911>
- Sezer, E., Igreja, J. & Vinci, I. (2024). Capturing city-transport interactions. An analysis on the urban rail network of Palermo (Italy). *TeMA - Journal of Land Use, Mobility and Environment*, (3), 197-214. <http://dx.doi.org/10.6093/1970-9870/10909>
- Spadaro, I. & Pirlone, F. (2024). Mobility, Participation and Sustainable Regeneration. Urban projects in Liguria Region. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 7-22. <http://dx.doi.org/10.6093/1970-9870/10901>
- Staricco, L., Verlinghieri, E. & Vitale Brovarone, E. (2024). Permanently temporary. Street experiments in the Torino Mobility Lab project. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 159-167. <http://dx.doi.org/10.6093/1970-9870/10934>
- Pezzagno, M. & Tira, M. (2018, Eds). *Town and Infrastructure Planning for Safety and Urban Quality: Proceedings of the XXIII International Conference on Living and Walking in Cities (LWC 2017), June 15-16, 2017, Brescia, Italy*. Leiden: CRC Press
- Tira, M., Pezzagno, M. & Richiedei, A. (2020, Eds). *Pedestrians, Urban Spaces and Health: Proceedings of the XXIV International Conference on Living and Walking in Cities (LWC, September 12-13, 2019, Brescia, Italy)*. London: CRC Press
- Turken, A.O. & Conticelli, E. (2024). Role of new technologies on Pedestrian Walking Behaviour Research. *TeMA - Journal of Land Use, Mobility and Environment*, (3), 83-96. <http://dx.doi.org/10.6093/1970-9870/10929>