TeMA

Journal of
Land Use, Mobility and Environment

print ISSN 1970-9889 e-ISSN 1970-9870
FedOA press - University of Naples Federico II

DOAJ anvur Rivista scientifica di classe A - 08/F1 Scopus WEB OF SCIENCE



NEW CHALLENGES FOR CITIES IN THE TWENTY-FIRST CENTURY

Regenerative Design - Climate Adaptation & Mitigation
Circular Economy - Citizen Agency - Urban Livability

Vol.19 n.1
April 2026

TeMA Journal has the objective of fostering and integrating studies on urban transformation and urban mobility, within a scientific context focused on adapting cities to global warming and oriented towards economic, social and environmental sustainability. The three issues of the 2026 propose articles that deal with the effects of climate change adaptation, reduction of energy consumption, AI-driven solutions to support urban planning, immigration flows, optimisation of land use, analysis and evaluation of civil protection plans in areas especially vulnerable to natural disasters.

TeMA is the Journal of Land Use, Mobility and Environment and offers papers with a unified approach to planning, mobility and environmental sustainability. With ANVUR resolution of April 2020, TeMA journal and the articles published from 2016 are included in the A category of scientific journals. The articles are included in main scientific database as Scopus (from 2023), Web of Science (from 2015) and the Directory of Open Access Journals (DOAJ). It is included in Sparc Europe Seal of Open Access Journals, and the Directory of Open Access Journals.

TeMA Journal of
Land Use, Mobility and Environment

NEW CHALLENGES FOR CITIES IN THE TWENTY-FIRST CENTURY:
Regenerative Design - Climate Adaptation & Mitigation - Circular Economy - Citizen Agency - Urban Livability

1 (2026)

Published by
Laboratory of Land Use, Mobility and Environment
DICEA - Department of Civil, Building and Environmental Engineering
University of Naples Federico II, Italy

TeMA is realized by CAB - Center for Libraries at University of Naples Federico II using Open Journal System

Editor-in-Chief: Rocco Papa
print ISSN 1970-9889 | online ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n°6 of 29/01/2008

Editorial correspondence
Laboratory of Land Use, Mobility and Environment
DICEA - Department of Civil, Building and Environmental Engineering
University of Naples Federico II
Piazzale Tecchio, 80
80125 Naples (Italy)

https://serena.sharepress.it/index.php/tema
e-mail: redazione.tema@unina.it

The cover image was created using an AI tool, taking into account the thematic content of the articles included in this issue.

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.
With ANVUR resolution of April 2020, TeMA Journal and the articles published from 2016 are included in A category of scientific journals. The articles published on TeMA are included in main international scientific database as Scopus (from 2023), Web of Science (from 2015) and the *Directory of Open Access Journals* (DOAJ). TeMA Journal has also received the *Sparc Europe Seal* for Open Access Journals released by *Scholarly Publishing and Academic Resources Coalition* (SPARC Europe). TeMA is published under a Creative Commons Attribution 4.0 License and is blind peer reviewed at least by two referees selected among high-profile scientists. TeMA has been published since 2007 and is indexed in the main bibliographical databases and it is present in the catalogues of hundreds of academic and research libraries worldwide.

EDITOR-IN-CHIEF

Rocco Papa, University of Naples Federico II, Italy

EDITORIAL ADVISORY BOARD

Mir Ali, University of Illinois, USA
Luca Bertolini, University of Amsterdam, Netherlands
Luuk Boelens, Ghent University, Belgium
Dino Borri, Politecnico di Bari, Italy
Enrique Calderon, Technical University of Madrid, Spain
Pierluigi Coppola, Politecnico di Milano, Italy
Derrick De Kerckhove, University of Toronto, Canada
Mark Deakin, Edinburgh Napier University, Scotland
Romano Fistola, University of Naples Federico II, Italy
Carmela Gargiulo, University of Naples Federico II, Italy
Aharon Kellerman, University of Haifa, Israel
Nicos Komninos, Aristotle University of Thessaloniki, Greece
David Matthew Levinson, University of Minnesota, USA
Paolo Malanima, Magna Græcia University of Catanzaro, Italy
Agostino Nuzzolo, Tor Vergata University of Rome, Italy
Enrica Papa, University of Westminster, United Kingdom
Serge Salat, UMCS Institute, France
Mattheos Santamouris, NK University of Athens, Greece
Ali Soltani, Shiraz University, Iran

ASSOCIATE EDITORS

Rosaria Battarra, CNR, Italy
Matteo Caglioni, Université Cote D'azur, France
Alessia Calafiore, University of Edinburgh, UK
Gerardo Carpentieri, University of Naples Federico II, Italy
Luigi dell'Olio, University of Cantabria, Spain
Isidoro Fasolino, University of Salerno, Italy
Stefano Franco, Politecnico di Bari, Italy
Carmen Guida, University of Naples Federico II, Italy
Thomas Hartmann, Utrecht University, Netherlands
Markus Hesse, University of Luxemburg, Luxemburg
Zhanat Idrisheva, D. Serikbayev EKTU, Kazakhstan
Zhadyra Konurbayeva, D. Serikbayev EKTU, Kazakhstan
Seda Kundak, Technical University of Istanbul, Turkey
Rosa Anna La Rocca, University of Naples Federico II, Italy
Houshmand Ebrahimpour Masoumi, TU of Berlin, Germany
Giuseppe Mazzeo, Pegaso Telematic University, Italy
Nicola Morelli, Aalborg University, Denmark
Yolanda P. Boquete, University of Santiago de Compostela, Spain
Dorina Pojani, University of Queensland, Australia
Nailya Saifulina, University of Santiago de Compostela, Spain
Athena Yiannakou, Aristotle University of Thessaloniki, Greece
John Zacharias, Peking University, China
Cecilia Zecca, Royal College of Art, UK
Floriana Zucaro, University of Naples Federico II, Italy

EDITORIAL STAFF

Laura Ascione, Ph.D. student at University of Naples Federico II, Italy
Annunziata D'Amico, Ph.D. student at University of Naples Federico II, Italy
Valerio Martinelli, Ph.D. student at University of Naples Federico II, Italy
Stella Pennino, Ph.D. student at University of Naples Federico II, Italy
Tonia Stiuso, Ph.D. student at University of Naples Federico II, Italy

TeMA Journal of Land Use, Mobility and Environment

NEW CHALLENGES FOR CITIES IN THE TWENTY-FIRST CENTURY:

Regenerative Design - Climate Adaptation & Mitigation - Circular Economy - Citizen Agency - Urban Livability

1 (2026)

Contents

5 EDITORIAL PREFACE
Rocco Papa

FOCUS

9 **The impact of Land Use and Land Cover (LULC) changes on coastal dynamics through landscape structure**
Makbulenur Onur

27 **Spatial and temporal evolution of urban reserve available land resources in the Karst region of North China from 1990 to 2020: a case study of Jinan city**
Shujin Wang, Shanzhong Qi

LUME (Land Use, Mobility and Environment)

41 **Assessing urban growth and pollution through nightlight data: a case study in Thailand**
Chaichana Kulworatit, Phuvis Kerdpramote, Saranya Saetang

63 **Exploring governance challenges in coastal and marine tourism. A comparative analysis of European case studies**
Barbara Gasparini di Gaetano, Emanuel Giannotti, Vittore Negretto, Denis Maragno

79 **Dynamic map decision support systems for spatial and mobility planning**
Mara Ladu, Ginevra Balletto, Tanja Congiu, Gianfranco Fancello, Ernesto Fontes Pupo

97 **Biodiversity and ecological network: connecting ecosystem services for a sustainable future. GeoAI for modica green city.**
Celestina Fazia, Chiara Spadaro

117 **Examining the temporal and spatial change of current land cover types in Demre District using machine learning**
Sibel Akten, Hüseyin Batuhan Dündar, Atila Gül

137 **Evaluating urban fabric transformations using GeoAI**
Alessandro Vitale

151 **CITISENSE. Enhancing urban well-being through smart design, data and AI in Italy's historic centres**
Massimo Zupi, Pierfrancesco Celani, Daniel Enrique Sardo, Margherita Tufarelli, Adriano Bisello

171 **Planning for sustainable tourism in protected areas. A policy-oriented spatial evaluation framework**
Rachele Vanessa Gatto, Francesca Perrone, Francesco Scorza

189 **Monitoring urban dynamics using Google Earth and GeoAI**
Francesco Lamonaca

REVIEW NOTES

201 **“Brain gain” in planning academia: learning from Albania’s practical approaches**
Irina Branko, Erida Curraj, Dorina Pojani

209 **Digital governance of the energy transition: regulatory frameworks, data infrastructures, and spatial planning**
Valerio Martinelli

217 **Governing the transformations of public space: active travel policies for people's health and well-being**
Annunziata D’Amico

225 **Soft adaptation measures for disaster risk reduction and urban resilience. Early warning systems**
Stella Pennino

239 **Modelling microclimatic characteristics for climate change adaptation solutions: the ENVI-met simulation tool**
Tonia Stiuso

245 **Adaptation insight: the state of climate knowledge**
Laura Ascione

TeMA - Journal of Land Use, Mobility and Environment

NEW CHALLENGES FOR CITIES IN THE TWENTY-FIRST CENTURY:
Regenerative Design - Climate Adaptation & Mitigation - Circular Economy - Citizen Agency - Urban Livability

ROCCO PAPA
DICEA - Department of Civil, Building and Environmental Engineering
University of Naples Federico II, Italy
ORCID: https://orcid.org/0000-0003-3355-1418
e-mail: rpapa@unina.it

TeMA Journal was founded in 2007 with the principal objective of fostering and integrating studies on urban transformation and urban mobility in all their aspects, within a scientific context focused on adapting cities to global warming and oriented towards economic, social and environmental sustainability. The journal also addresses studies on hyper-connectivity, algorithmic governance, infrastructure durability, social equity and inclusion, and intergenerational justice. In other words, the mission of this initiative is to contribute to the development of a novel theoretical and methodological framework that transcends the boundaries separating these research domains, and to develop innovative solutions to the issues of 21st-century cities, addressing them again using methods and techniques rooted in the scientific culture of the last century.

The three issues of the 2026 volume of TeMA Journal propose articles that deal with the effects of Global warming, climate change adaptation, reduction of energy consumption, AI-driven solutions to support urban governance and transformation, immigration flows, optimisation of land use, analysis and evaluation of civil protection plans in areas especially vulnerable to natural disasters.

In this issue, the section "Focus" contains two studies. The first paper "The impact of Land Use and Land Cover (LULC) changes on coastal dynamics through landscape structure", by Makbulenur Onur (Karadeniz Technical University in Turkey), analyzes how land use and land cover (LULC) changes influence coastal landscape structure and user perception, this study compares two neighboring beach areas in Budva, Montenegro, one impacted by LULC change and the other largely maintaining its natural state.

The second contribution "Spatial and temporal evolution of urban reserve available land resources in the Karst region of North China from 1990 to 2020: a case study of Jinan city", by Shujin Wang, Shanzhong Qi (Shandong Normal University in China), investigates the spatial and temporal evolution of urban reserve available land resources in Jinan City, a representative karst region of North China, over the period 1990-2020 using integrated RS-GIS methods.

The section "LUME" includes nine studies. The first contribution of the section "Assessing urban growth and pollution through nightlight data: a case study in Thailand", by Chaichana Kulworatit, Phuvis Kerdpramote, and Saranya Saetang (King Mongkut's Institute of Technology Ladkrabang and Kasetsart University Kamphaeng Saen Campus in Thailand), aims to explore the relationship between urban development and air pollution in Thailand by analyzing remote sensing nightlight data and carbon monoxide (CO) concentrations over six years (2019-2024).

The second contribution of the section "Exploring governance challenges in coastal and marine tourism. A comparative analysis of European case studies", by Barbara Gasparini di Gaetano, Emanuel Giannotti, Vittore Negretto, and Denis Maragno (IUAV University of Venice in Italy), deals with land-sea interactions in spatial planning, particularly referring to tourism-intensive coastal areas where environmental protection and

economic development collide. The paper focuses on the recently adopted Italian Maritime Spatial Plan and its application in the Friuli Venezia Giulia region also by the analysis of three coastal and marine contexts (Port-Cros National Park in France, Puck Bay in Poland, and the island of Crete in Greece) and concludes emphasizing the role of institutional coordination, participation, and administrative capacity for the implementation of maritime spatial planning.

The third contribution of the section "Dynamic map decision support systems for spatial and mobility planning" by Mara Ladu, Ginevra Balletto, Tanja Congiu, Gianfranco Fancello, and Ernesto Fontes Pupo (University of Cagliari and University of Sassari in Italy) proposes a decision support system architecture to support the Mobility as Service in Sardinia region, integrating geospatial datasets covering mainly demographic and socio-economic aspects, the supply of key services, and the provision and demand for transport, as well as the spatial distribution of tourist flows and related externalities, to offer a holistic perspective on local and regional transport needs, opportunities, and gaps.

The fourth contribution of the section "Biodiversity and ecological network: connecting ecosystem services for a sustainable future. GeoAI for Modica green city" by Celestina Fazia and Chiara Spadaro (University of Enna "Kore" in Italy) investigates the role of ecological networks and ecosystem services as strategic infrastructures for enhancing urban resilience and biodiversity. The Modica Green City Masterplan, supported by GeoAI and GIS tools, demonstrates how integrated, ecosystem-based planning can guide sustainable urban transformation. The study highlights the value of digital and participatory approaches aligned with EU cohesion policies and Agenda 2030 to support climate adaptation and territorial regeneration.

The fifth contribution of the section "Examining the temporal and spatial change of current land cover types in Demre District using machine learning" by Sibel Akten, Hüseyin Batuhan Dündar, and Atila Gül (Isparta University of Applied Sciences and Süleyman Demirel University in Italy) analyzes the temporal and spatial changes in current land use types in Demre district of Antalya Province and to establish a foundation for future land management studies, was supported by multispectral satellite images obtained from the Landsat 5- Thematic Mapper and Landsat 8- Operational Land Imager remote sensing satellites.

The sixth contribution "Evaluating urban fabric transformations using GeoAI", by Alessandro Vitale (University of Calabria in Italy) proposes a GeoAI-based framework that integrates Random Forest (RF) classification with spatial indicators to analyze urban fabric transformations in Ravenna, aiming at demonstrating how combining supervised classification with spatial metrics can provide deeper insights into urban growth, supporting more informed planning and policy.

The seventh article "CITISENSE. Enhancing urban well-being through smart design, data and AI in Italy's historic centres", by Massimo Zupi, Pierfrancesco Celani, Daniel Enrique Sardo, Margherita Tufarelli, and Adriano Bisello (University of Calabria, University of Florence and Jakala Civitas S.p.A in Italy and Universidad Jesuitica de Guadalajara in Mexico) examines how GeoAI-enabled urban analysis and participatory design methodologies can enhance urban well-being while preserving cultural heritage in small and medium-sized historic centres. The research develops a replicable methodological framework combining advanced technologies (AI, big data, wearable devices) with Living Lab participatory processes.

The eighth article "Planning for sustainable tourism in protected areas. A policy-oriented spatial evaluation framework" by Rachele Vanessa Gatto, Francesca Perrone, and Francesco Scorza (University of Basilicata and Sapienza University of Rome in Italy) introduces the Robustness Supply Tourism Index (RSTI), a robust tool to assess the infrastructural balance of tourism destinations within protected areas. The study focuses on the Appennino Lucano Val d'Agri Lagonegrese National Park in Italy, where the Specialized Tourism EcoSYstems model was implemented to define Destination Areas, and the RSTI was applied to assess the distribution of tourism infrastructure supply within these areas.

The last article "Monitoring urban dynamics using Google Earth and GeoAI", by Francesco Lamonaca (University of Calabria and National Research Council Institute of Nanotechnology in Italy), presents an innovative measurement method based on Google Earth Engine and Unsupervised K-means Clustering of multispectral satellite images to map urban and vegetation shifts. The proposed method was applied in 15

southern Italian cities, and the results were validated with the ESA Land Cover dataset. Results show 167 hectares consumed from 2005 to 2021.

The Review Notes section proposes six insights on the themes of the TeMA Journal.

The first Review Notes is entitled "Brain gain in planning academia: learning from Albania's practical approaches", authored by Irina Branko, Erida Curraj, and Dorina Pojani. The RN presents two successful "brain gain" initiatives implemented in Albania: READ, a planning research project, and GERMIN, a planning education project. Both programs represent structured efforts to mobilise diaspora expertise in order to strengthen higher education, research, and professional practice, addressing capacity gaps intensified by the prolonged emigration of skilled professionals.

The International Regulation and Legislation for the Energy Transition section of Review Notes is entitled "Digital governance of the energy transition: regulatory frameworks, data infrastructures, and spatial planning", authored by Valerio Martinelli. The RN analyzes how the EU directives are redefining the operational framework of territorial planning through binding interoperability and digital infrastructure requirements. It concludes with a reflection on the evolutionary role of the urban planner as a mediator between legislation, data ecosystems and territorial transformation.

The Urban Strategies, Programmes and Tools section of Review Notes is entitled "Governing the transformations of public space: active travel policies for people's health and well-being", authored by Annunziata D'Amico, analyzes international tools and strategies for transforming public spaces into environments geared toward active mobility. Urban design focused on daily walking and cycling promotes collective well-being by integrating public health, environmental sustainability, and the quality of the built environment

The Urban Practices section of Review Notes is entitled "Soft Adaptation Measures for Disaster Risk Reduction and Urban Resilience. Early Warning Systems", authored by Stella Pennino. The RN on Urban Practices examines the role of Soft Adaptation Measures in Disaster Risk Reduction (DRR) and Urban Resilience. It discusses the functioning of Early Warning Systems (EWS) and their relevance for Urban Planning. Three illustrative case studies are presented to highlight reproducible urban practices and potential future developments.

The Urban planning literature review section of Review Notes is entitled "Modelling microclimatic characteristics for climate change adaptation solutions: the ENVI-met simulation tool", authored by Tonia Stiuso, provides a comprehensive overview of the ENVI-met simulation tool, focusing on its methodological framework and operational potential in the field of climate change adaptation. Using a variety of scientific sources and practical resources.

The Urban planning literature review section of Review Notes is entitled "Adaptation insight: the state of climate knowledge", authored by Laura Ascione. This first contribution is dedicated to a review of reports on the state of knowledge on climate change in terms of emerging risks, observed impacts, and the conditions of vulnerability that amplify its effects in different territorial and social contexts.

Reference

Akten, S., Dündar, H.B. & Gül, A. (2025). Examining the temporal and spatial change of current land cover types in Demre District using machine learning GeoAI-object-based controlled classification. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 117-136. http://dx.doi.org/10.6093/1970-9870/12803

Ascione, L. (2026). Adaptation insight: the state of climate knowledge. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 245-250. http://dx.doi.org/10.6093/1970-9870/13332

Branko, I., Curraj, E. & Pojani, D. (2026). "Brain gain" in planning academia: Learning from Albania's practical approaches. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 201-208. http://dx.doi.org/10.6093/1970-9870/13337

D'Amico, A. (2026). Governing the transformations of public space: active travel policies for people's health and well-being. *TeMA - Journal of Land Use, Mobility and Environment*, *18* (3), 217-224. http://dx.doi.org/10.6093/1970-9870/13331

Fazia, C. & Spadaro, C. (2026). Biodiversity and ecological network: connecting ecosystem services for a sustainable future. GeoAI for Modica green city. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 97-116. https://doi.org/10.6093/1970-9870/11322

Gasparini di Gaetano, B., Giannotti, E., Negretto, V. & Maragno, D. (2026). Exploring governance challenges in coastal and marine tourism. A comparative analysis of European case studies. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 63-78. http://dx.doi.org/10.6093/1970-9870/12458

Gatto, R. V., Perrone, F. & Scorza, F. (2026). Planning for sustainable tourism in protected areas. A policy-orientedspatial evaluation framework. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 171-188. https://doi.org/10.6093/1970-9870/12735

Kulworatit, C., Kerdpramote, P. & Saetang, S. (2026). Assessing urban growth and pollution through nightlight data: a case study in Thailand. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 41-61. http://dx.doi.org/10.6093/1970-9870/12394

Ladu, M., Balletto, G., Congiu, T., Fancello, G., Fontes Pupo, E. (2026). Dynamic map decision support systems for spatial and mobility planning. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 79-96. http://dx.doi.org/10.6093/1970-9870/1263

Lamonaca, F. (2026). Monitoring urban dynamics using Google Earth and GeoAI. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 189-200. http://dx.doi.org/10.6093/1970-9870/11343

Makbulenur, O. (2026). The impact of Land Use and Land Cover (LULC) changes on coastal dynamics through landscape structure. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 9-26. http://dx.doi.org/10.6093/1970-9870/12621

Martinelli, V. (2026). Digital governance of the energy transition: regulatory frameworks, data infrastructures, and spatial planning. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 209-216. http://dx.doi.org/10.6093/1970-9870/13338

Pennino, S. (2026). Soft adaptation measures for disaster risk reduction and urban resilience. Early warning systems. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 225-237. http://dx.doi.org/10.6093/1970-9870/13361

Shujin, W., Shanzhong, Q. (2026). Spatial and temporal evolution of urban reserve available land resources in the Karst region of North China from 1990 to 2020: a case study of Jinan city. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 27-39. http://dx.doi.org/10.6093/1970-9870/12656

Stiuso, T. (2026). Modelling microclimatic characteristics for climate change adaptation solutions: the ENVI-met simulation tool. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 239-243. http://dx.doi.org/10.6092/1970-9870/13362

Vitale, A. (2026). Evaluating urban fabric transformations using GeoAI. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 137-150. https://doi.org/10.6093/1970-9870/11344

Zupi, M., Celani, P., Sardo, D. E., Tufarelli, M., Bisello, A. (2024). CITISENSE. Enhancing urban well-being through smart design, data and AI. *TeMA - Journal of Land Use, Mobility and Environment*, *19* (1), 151-170. http://dx.doi.org/10.6093/1970-9870/11551