# TeMA

# Journal of Land Use, Mobility and Environment

The characteristics of urban travel behaviors and the attitudes of passengers in the Middle East and North Africa (MENA) is less-studied. There is a considerable knowledge gap about the circumstances of how people think and decide about their short-term, medium-term, and long-term mobility for commute and non-commute travels.

TeMA Journal of Land Use, Mobility and Environment offers papers with a unified approach to planning and mobility. TeMA has also received the Sparc Europe Seal of Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ).

Special Issue 1.2018

URBANTRAVELBEHAVIOR
IN THE MIDDLE EAST AND NORTH AFRICA

ISSN 1970-9889 University of Naples Federico II



Special Issue 1.2018

# URBAN TRAVEL BEHAVIOR IN THE MIDDLE EAST AND NORTH AFRICA

#### Published by

Laboratory of Land Use Mobility and Environment DICEA - Department of Civil, Architectural and Environmental Engineering University of Naples "Federico II"

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

Editor-in-chief: Rocco Papa print ISSN 1970-9889 | on line 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, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it

e-mail: redazione.tema@unina.it

Cover Image by Houshmand E. Masoumi of landscape in Teheran

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.

The Italian National Agency for the Evaluation of Universities and Research Institutes (ANVUR) classified TeMA as scientific journal in the Area 08. TeMA has also received the Sparc Europe Seal for Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ). TeMA is published under a Creative Commons Attribution 3.0 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, Polytechnic University of Bari, Italy Enrique Calderon, Polytechnic University of Madrid, Spain Roberto Camagni, Polytechnic University of Milan, Italy Derrick De Kerckhove, University of Toronto, Canada Mark Deakin, Edinburgh Napier University, Scotland 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 Rocco Papa, University of Naples Federico II, Italy Serge Salat, Urban Morphology and Complex Systems Institute, France Mattheos Santamouris, National Kapodistrian University of Athens, Greece Ali Soltani, Shiraz University, Iran

#### **ASSOCIATE EDITORS**

Rosaria Battarra, National Research Council Institute of Studies on Mediterranean Societies, Italy Luigi dell'Olio, University of Cantabria, Spain Romano Fistola, University of Sannio, Italy Carmela Gargiulo, University of Naples Federico II, Italy Thomas Hartmann, Utrecht University, Netherlands Markus Hesse, University of Luxemburg, Luxemburg Seda Kundak, Technical University of Istanbul, Turkey Rosa Anna La Rocca, University of Naples Federico II, Italy Houshmand Ebrahimpour Masoumi, Technical University of Berlin, Germany Giuseppe Mazzeo, National Research Council Institute of Studies on Mediterranean Societies, Italy Nicola Morelli, Aalborg University, Denmark Enrica Papa, University of Westminster, United Kingdom Dorina Pojani, University of Queensland, Australia Floriana Zucaro, University of Naples Federico II, Italy

#### **EDITORIAL STAFF**

Gennaro Angiello, PhD at University of Naples Federico II, Italy Gerardo Carpentieri, PhD at University of Naples Federico II, Italy Stefano Franco, PhD student at Luiss University Rome, Italy Rosa Morosini, PhD student at University of Naples Federico II, Italy Marco Raimondo, Engineer, University of Sannio, Italy Maria Rosa Tremiterra, PhD student at University of Naples Federico II, Italy Andrea Tulisi, PhD at Second University of Naples, Italy Special Issue 1.2018

# URBAN TRAVEL BEHAVIOR IN THE MIDDLE EAST AND NORTH AFRICA

## Contents

3	<b>Editorial Preface</b>
	H. E. Masoumi

7 Understanding the needs of Mena public transport customers: culture of service and gender responsive recommendations

A. Delatte, T. Baouni, R. Belwal, L. Daou, D. Gourram, R. Imam, M. S. Zitoun, A. Smadi

- 31 Urban Travel behavior determinants in Saudi Arabia
  - G. Tesoriere, M. F. Errigo
- 47 Modeling and forecasting car ownership based on socio-economic and demographic indicators in Turkey

H. Ceylan, O. Baskan, C. Ozan

Analysis of the main service quality dimensions affecting satisfaction the metropolitan rail public transit users in Algiers

T. Baouni, R. DE Ona, B. Merad, L. Tahraoui, J. L. Machado – Leon, J. De Ona

- **83** Travel Behaviour across urban and rural areas of Pakistan M. Adeel
- The development of a walkability audit. Based on Iranian cities pedestrian environment

A.Soltani, M. Hosseinpour, P. Zare, M. Sholeh



### **EDITORIAL PREFACE**

Special Issue 1.2018
Urban Travel Behavior in the Middle East and North Africa

Dr. Ing. Houshmand E. Masoumi,

Technische Universität Berlin, Center for Technology and Society, Berlin, Germany

E-mail: masoumi@ztg.tu-berlin.de

This Special Issue the TeMA Journal of Land Use, Mobility and Environment focuses on an already researched subject of urban travel behavior and decisions in the less-studied geographical context of the Middle East and North Africa (MENA). There is a large knowledge gap concerning the circumstances of urban mobility decision-making within the socio-cultural context of the MENA region and the differences in people's preferences and approaches toward transport compared to other regions of the world. A relatively large body of literature has been produced about the topic in the international context during the past three decades, but the literature is limited to primarily high-income countries. As a result, the sub-topics being discussed today have become quite narrow in focus. However, most of the countries located in the MENA region are in need of more general studies clarifying the main human-related aspects of urban mobility in order to provide local urban transportation planning norms and thereby achieve more sustainable transport modes. This lack of knowledge is the reason behind the publication of this special issue. In this issue, the geographical borders of the MENA region issue encompass the widely accepted area of Iran in the east to Morocco in the west. Turkey has not been included in some MENA definitions previously, and Pakistan has been excluded in most of them. Nevertheless, due to strong socio-cultural and religious relations, they have been included in this issue.

So far, a limited number of studies have addressed urban travel behavior and people's mobility preferences and decisions in conjunction with the socio-economics, land use, and human activities in the region. There have been studies undertaken in Egypt (El-Bany et al., 2014; El-Dorghamy & Mosa, 2016), Jordan (Hamed & Olaywah, 2000; Shbeeb & Awad, 2013), Iran (Ahmadi Azari et al., 2012; Babakan et al., 2018; Etminani-Ghasrodashti & Ardeshiri, 2015, 2016; Hatamzadeh et al., 2017b, 2017a; Masoumi, 2013, 2014, 2015; Mehdizadeh et al., 2016, 2017; Rezasoltani et al., 2015; Shahangian et al., 2012; Soltani, 2017; Soltani & Shams, 2017; Soltanzadeh & Masoumi, 2014), Lebanon (Chalak et al. 2016; Danaf et al., 2014), Saudi Arabia (Al-Atawi, 2016; Al-Atawi & Saleh, 2014; Alotaibi, 2017), United Arab Emirates (Abulibdeh, 2017), Turkey (Gokasar & Gunay, 2017; Ozbil et al., 2016), and Pakistan (Gul et al., 2018). Nevertheless, the amount of studies, their subject coverage, and research quality are not entirely satisfying. Moreover, due to the limited number of studies on each sub-topic, little to no consistency or decisive results have been generated. Overall, this research output still does not seem sufficient for policy-making on national or local levels. Thus, more in-depth studies using primary and/or secondary data are needed.

As noted in the above paragraph, most of the published results have been generated since 2012 onwards, indicating the novelty and recentness of the studies and indirectly implying the need for more studies covering a wider range of sub-topics. In the meantime, the precision, accuracy, and comprehensiveness of the studies are still far from satisfactory.

In response to the above needs, this issue is aligned with the following research topics:

- Interconnections of people's urban transport preferences and needs with urban growth and housing;
- Relations between urban travel behavior and socio-economics, demographics, and culture;
- Modeling and forecasting of future urban mobility trends and needs;
- Human perceptions about urban transportation;
- Walkability and urban land use on the micro scale.

The issue starts with a paper from Delatte et al. describing passengers' needs regarding public transportation in Casablanca, Algiers, Amman, Beirut, and Muscat. This study has a good geographical coverage, including cities from the westernmost reaches of the region through to the east in Oman. The current status of public transit use in the five cities is presented in the manuscript by means of data collected from 984 respondents and 49 women in focus groups. A paper on Saudi Arabia by Errigo and Tesoriere on urban travel behavior determinants in the cities of Riyadh (the capital), Dammam, and Buraydah highlights the connection between travel behavior, the national economy, and social issues, and suggests that the Saudi urban development strategy change urban form in order to reduce car dependency. Similarly, Ceylan et al. focus on socio-economic and demographic determinants and indicators of car ownership in Turkey. According to their forecasting based on scenarios related to Gross Domestic Production and gasoline price, they predict that the car ownership rate in Turkey will be between 230 and 325 vehicles per one thousand inhabitants depending on economic achievements, global oil prices, and national taxation policies. Despite this projected growth, the figure will still be smaller than the major European Union countries. In a paper representing North Africa, Baouni et al. use the results of the Customer Satisfaction Survey of Algiers (2014) to investigate the socio-economic variables and urban travel patterns behind customer satisfaction with the city's new collective transit systems like the new tramway and underground heavy rail system. Adeel examines the variation between urban and rural mobility characteristics such as travel length/time, trip frequency, etc. targeting individual and household socio-economic variables. The paper's analysis of the 2007 Pakistani national survey data finds that the built and social/cultural environments are important in determining travel mode choices, especially for women. Finally, Soltani et al. attempt to produce a walkability audit tool based on environmental measures of walking behaviors in a neighborhood of Shiraz, Iran. They found 50 environmental measures to be reliable and meaningful factors when included in the audit tool.

The papers of this issue investigate travel behaviors in cities from Morocco, Algeria, Jordan, Lebanon, Oman, Iran, Turkey, Saudi Arabia, and Pakistan. The authors are based in Algeria, Jordan, Lebanon, Iran, Turkey, Saudi Arabia, Spain, Oman, Italy, Australia, and the UK. The referees of this issue are researchers and experts located in Iran, Italy, Malaysia, Australia, France, and the UK.

### **REFERENCES**

Abulibdeh, A. (2017). Implementing congestion pricing policies in a MENA Region City: Analysis of the impact on travel behaviour and equity. *Cities*. Advance online publication. doi:https://doi.org/10.1016/j.cities.2017.12.003

Ahmadi Azari, K., Arintono, S., & Hamid, H. (2012). Effects of parking and cordon charge policies on tourist's modal shift in central business district of Mashhad city, Iran. *Current Issues in Tourism*, *15*(5), 489–496. doi:https://doi.org/10.1080/13683500.2011.634495

Al-Atawi, A. (2016). Sustainable travel modes in Saudi Arabia: Is there a potential for formal car-sharing scheme? *World Journal of Science, Technology and Sustainable Development, 13*(1), 46–55. doi:https://doi.org/10.1108/WJSTSD-10-2015-0052

Al-Atawi, A., & Saleh, W. (2014). Travel behaviour in Saudi Arabia and the role of social factors. *Transport, 29*(3), 269–277. doi:https://doi.org/10.3846/16484142.2014.913199

Alotaibi, O. M. (2017). Potential Demand for Public Transport in Riyadh City, Saudi Arabia. Cardiff University.

Babakan, A. S., Alimohammadi, A., & Taleai, M. (2018). An agent-based evaluation of impacts of transport developments on the modal shift in Tehran, Iran. *arXiv preprint arXiv:1803.04934*. Advance online publication. doi:https://doi.org/10.1080/19439342.2014.994656

Chalak, A., Al-Naghi, H., Irani, A., & Abou-Zeid, M. (2016). Commuters' behavior towards upgraded bus services in Greater Beirut: Implications for greenhouse gas emissions, social welfare and transport policy. *Transportation Research Part A: Policy and Practice*, 88, 265–285. doi:https://doi.org/10.1016/j.tra.2016.04.001

Danaf, M., Abou-Zeid, M., & Kaysi, I. (2014). Modeling travel choices of students at a private, urban university: Insights and policy implications. *Case Studies on Transport Policy*, *2*(3), 142–152. doi:https://doi.org/10.1016/j.cstp.2014.08.006

El-Bany, M. E.-S., Shahin, M. M., Hashim, I. H., & Serag, M. S. (2014). Policy sensitive mode choice analysis of Port-Said City, Egypt. *Alexandria Engineering Journal*, *53*(4), 891–901. doi:https://doi.org/10.1016/j.aej.2014.09.006

El-Dorghamy, A., & Mosa, A. I. (2016). Exploring children's travel to school in upgraded informal settlements: A qualitative case study of Ezbet El-Haggana. *Transportation Research Procedia*, *14*, 1277–1286. doi:https://doi.org/10.1016/j.trpro.2016.05.200

Etminani-Ghasrodashti, R., & Ardeshiri, M. (2015). Modeling travel behavior by the structural relationships between lifestyle, built environment and non-working trips. *Transportation Research Part A: Policy and Practice, 78*, 506–518.

Etminani-Ghasrodashti, R., & Ardeshiri, M. (2016). The impacts of built environment on home-based work and non-work trips: An empirical study from Iran. *Transportation Research Part A: Policy and Practice, 85*, 196–207. doi:https://doi.org/10.1016/j.tra.2016.01.013

Gokasar, I., & Gunay, G. (2017). Mode choice behavior modeling of ground access to airports: A case study in Istanbul, Turkey. *Journal of Air Transport Management*, *59*, 1–7. doi:https://doi.org/10.1016/j.jairtraman.2016.11.003

Gul, Y., Sultan, Z., Moeinaddini, M., & Ahmed Jokhio, G. (2018). Measuring the differences of neighbourhood environment and physical activity in gated and non-gated neighbourhoods in Karachi, Pakistan. *Journal of Urban Design*, 1–20.

Hamed, M. M., & Olaywah, H. H. (2000). Travel-related decisions by bus, servis taxi, and private car commuters in the city of Amman, Jordan. Cities, 17(1), 63–71. doi:https://doi.org/10.1016/S0264-2751(99)00052-9

Hatamzadeh, Y., Habibian, M., & Khodaii, A. (2017a). Walking behavior across genders in school trips, a case study of Rasht, Iran. *Journal of Transport & Health*, *5*, 42–54. doi:https://doi.org/10.1016/j.jth.2016.08.011

Hatamzadeh, Y., Habibian, M., & Khodaii, A. (2017b). Walking and jobs: A comparative analysis to explore factors influencing flexible and fixed schedule workers, a case study of Rasht, Iran. *Sustainable cities and society, 31*, 74–82.

Masoumi, H. E. (2014). A theoretical approach to capabilities of the traditional urban form in promoting sustainable transportation. *Theoretical and Empirical Researches in Urban Management*, *9*(1), 44–60.

Masoumi, H. E. (2015). Transformation of Urban Form and the Effects on Travel Behavior in Iran.

Masoumi, H. E. (2013). Modeling Travel Behavior Impacts of Micro-Scale Land Use and Socio-Economic Factor. *Tema. Journal of Land Use, Mobility and Environment, 6*(2), 235–250. doi:https://doi.org/10.6092/1970-9870/1484

Mehdizadeh, M., Mamdoohi, A., & Nordfjaern, T. (2017). Walking time to school, children's active school travel and their related factors. *Journal of Transport & Health*, *6*, 313–326. doi:https://doi.org/10.1016/j.jth.2017.01.012

Mehdizadeh, M., Nordfjaern, T., & Mamdoohi, A. (2016). The role of socio-economic, built environment and psychological factors in parental mode choice for their children in an Iranian setting. *Transportation*, 1–21. doi:https://doi.org/10.1007/s11116-016-9737-z

Ozbil, A., Argin, G., & Yesiltepe, D. (2016). Pedestrian route choice by elementary school students: The role of street network configuration and pedestrian quality attributes in walking to school. *International Journal of Design Creativity and Innovation*, 4(2), 67–84. doi:https://doi.org/10.1080/21650349.2015.1123120

Rezasoltani, M., Behzadfar, M., & Said, I. (2015). A Model Development for Children's Walking in Neighborhood. *Procedia-Social and Behavioral Sciences*, 201, 30–38. doi:https://doi.org/10.1016/j.sbspro.2015.08.116

Shahangian, R., Kermanshah, M., & Mokhtarian, P. (2012). Gender Differences in Response to Policies Targeting Commute to Automobile-Restricted Central Business District: Stated Preference Study of Mode Choice in Tehran, Iran. *Transportation Research Record: Journal of the Transportation Research Board.* (2320), 80–89. doi:https://doi.org/10.3141/2320-10

Shbeeb, L., & Awad, W. (2013). Walkability of School Surroundings and its Impact on Pedestrian Behaviour. *Tema. Journal of Land Use, Mobility and Environment, 6*(2), 171–188. doi:https://doi.org/10.6092/1970-9870/1608

Soltani, A. (2017). Social and urban form determinants of vehicle ownership; evidence from a developing country. *Transportation Research Part A: Policy and Practice, 96,* 90–100. doi:https://doi.org/10.1016/j.tra.2016.12.010

Soltani, A., & Shams, A. (2017). Analyzing the influence of neighborhood development pattern on modal choice. *Journal of Advanced Transportation*, 2017.doi: https://doi.org/10.1155/2017/4060348

Soltanzadeh, H., & Masoumi, H. E. (2014). The Determinants of Transportation Mode Choice in the Middle Eastern Cities: The Kerman Case, Iran. *Tema. Journal of Land Use, Mobility and Environment, 7*(2), 199–222. doi:https://doi.org/10.6092/1970-9870/2518