

# TeMA

Journal of  
Land Use, Mobility and Environment

There are a number of different future-city visions being developed around the world at the moment: one of them is Smart Cities: ICT and big data availability may contribute to better understand and plan the city, improving efficiency, equity and quality of life. But these visions of utopia need an urgent reality check: this is one of the future challenges that Smart Cities have to face.

Tema is the Journal of Land use, Mobility and Environment and offers papers with a unified approach to planning and mobility. TeMA Journal 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).



**PLANNING FOR SMART CITIES**  
DEALING WITH NEW URBAN CHALLENGES

## SMART CITY CHALLENGES : PLANNING FOR SMART CITIES. DEALING WITH NEW URBAN CHALLENGES 3 (2014)

**Published by**

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

TeMA is realised 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](http://www.tema.unina.it)  
e-mail: [redazione.tema@unina.it](mailto:redazione.tema@unina.it)

# TeMA

Journal of  
Land Use, Mobility and Environment

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, Università degli Studi di Napoli Federico II, Italy

## EDITORIAL ADVISORY BOARD

Luca Bertolini, Universiteit van Amsterdam, Netherlands  
Virgilio Bettini, Università Luav di Venezia, Italy  
Dino Borri, Politecnico di Bari, Italy  
Enrique Calderon, Universidad Politécnica de Madrid, Spain  
Roberto Camagni, Politecnico di Milano, Italy  
Robert Leonardi, London School of Economics and Political Science, United Kingdom  
Raffaella Nanetti, College of Urban Planning and Public Affairs, United States  
Agostino Nuzzolo, Università degli Studi di Roma Tor Vergata, Italy  
Rocco Papa, Università degli Studi di Napoli Federico II, Italy

## EDITORS

Agostino Nuzzolo, Università degli Studi di Roma Tor Vergata, Italy  
Enrique Calderon, Universidad Politécnica de Madrid, Spain  
Luca Bertolini, Universiteit van Amsterdam, Netherlands  
Romano Fistola, University of Sannio, Italy  
Adriana Galderisi, Università degli Studi di Napoli Federico II, Italy  
Carmela Gargiulo, Università degli Studi di Napoli Federico II, Italy  
Giuseppe Mazzeo, CNR - Istituto per gli Studi sulle Società del Mediterraneo, Italy

## EDITORIAL SECRETARY

Rosaria Battarra, CNR - Istituto per gli Studi sulle Società del Mediterraneo, Italy  
Andrea Ceudech, Università degli Studi di Napoli Federico II, Italy  
Rosa Anna La Rocca, Università degli Studi di Napoli Federico II, Italy  
Enrica Papa, University of Ghent, Belgium

## SMART CITY CHALLENGES: PLANNING FOR SMART CITIES. DEALING WITH NEW URBAN CHALLENGES 3 (2014)

### Contents

EDITORIALE **267** EDITORIALE  
Rocco Papa Rocco Papa

FOCUS FOCUS

**269** The Role of Tourism  
in Planning the Smart City  
Rosa Anna La Rocca

**285** Politiche 'Smart' e Visione Metropolitana:  
la Dimensione Territoriale  
nell'Esperienza Progettuale  
della Amsterdam Smart City Platform  
Giulia Fini, Salvatore Caschetto

LAND USE, MOBILITY  
AND ENVIRONMENT

LAND USE, MOBILITY  
AND ENVIRONMENT

**301** Urban Taxing Alternatives for Private  
Vehicles as an Urban Mobility  
Management System  
Cristiano Souza Marins, Romulo Orrico Dante Filho,  
Wellington Nascimento Silva

# TeMA

Journal of  
Land Use, Mobility and Environment

**315** Centro Direzionale of Naples.  
A "Smart" Concept  
Fabrizio Canfora, Fabio Corbisiero

**333** REVIEW PAGES  
Gennaro Angiello, Gerardo Carpentieri,  
Valentina Pinto, Laura Russo, Floriana Zucaro

# TeMA

Journal of  
Land Use, Mobility and Environment

TeMA 3 (2014) 269-283  
print ISSN 1970-9889, e- ISSN 1970-9870  
DOI: 10.6092/1970-9870/2814

paper received 29 September 2014, accepted 28 November 2014 Licensed  
under the Creative Commons Attribution – Non Commercial License 3.0  
[www.tema.unina.it](http://www.tema.unina.it)

*How to cite item in APA format:*

La Rocca, R. A. (2014). The Role of Tourism in Planning the Smart City. *Tema. Journal of Land Use, Mobility and Environment*, 7(3), 269-283.

Doi: <http://dx.doi.org/10.6092/1970-9870/2814>



## THE ROLE OF TOURISM IN PLANNING THE SMART CITY

ROSA ANNA LA ROCCA

Department of Civil, Architectural and Environmental  
Engineering (DICEA) – University of Naples Federico II  
e-mail: [larocca@unina.it](mailto:larocca@unina.it)  
URL: [www.dicea.unina.it](http://www.dicea.unina.it)

### ABSTRACT

The article starts from the consideration that tourism, for the size it has assumed and for its role in the economies, can be considered an "urban phenomenon"; as such, it needs adequate governance processes, politics and tools in order to reduce impacts on the organization of cities and urban livability in general. The emerging paradigm of "Smart City" is an opportunity to reconsider the current mechanisms of government and planning of the cities, but it needs a holistic approach that goes beyond the one applied per parts that still seems to prevail in the decline of the components of urban smartness. At present, the technological component seems to prevail probably due to the ease of diffusion of the instruments, rather than an innovation of the processes. Promotion initiatives concentrate exclusively on the city branding, rather than on initiatives to make cities able to support an additional urban load expressed by the tourism demand. Yet, potentialities of the application of new technologies could strengthen the decisional role in defining adequate urban policies to manage urban tourism. However, urban smartness for tourism seems to be concentrated on the amount of apps available to enhance the use of specific resources or, more rarely, of the urban mobility systems. Both the "big data" and the "open data" revolution, in Italy, do not yet seem to have achieved the hoped results, and the availability of data to allow appropriate management actions, is still one of the main difficulties for those involved in the analysis and quantification of the phenomenon. In addition, the numerous rankings on urban smartness refer to the prevalence of one component on the others, failing to consider the complexity of the urban system and of tourism, in particular. With these premises, this article tries to underline how tourism could be the object of urban policies and strategies aimed at reducing impacts on the city.

### KEYWORDS:

Smart City, Tourism, Urban Planning

# TeMA

Journal of  
Land Use, Mobility and Environment

TeMA 3 (2014) 269-283  
print ISSN 1970-9889, e- ISSN 1970-9870  
DOI: 10.6092/1970-9870/2814

paper received 29 September 2014, accepted 28 November 2014 Licensed  
under the Creative Commons Attribution – Non Commercial License 3.0  
[www.tema.unina.it](http://www.tema.unina.it)

*How to cite item in APA format:*

La Rocca, R. A. (2014). The Role of Tourism in Planning the Smart City. *Tema. Journal of Land Use, Mobility and Environment*, 7(3), 269-283.

Doi: <http://dx.doi.org/10.6092/1970-9870/2814>



## 旅游在规划智能城市中所起的作用

ROSA ANNA LA ROCCA

Department of Civil, Architectural and Environmental  
Engineering (DICEA) – University of Naples Federico II  
e-mail: [lارocca@unina.it](mailto:lارocca@unina.it)  
URL: [www.dicea.unina.it](http://www.dicea.unina.it)

### 摘要

本文设定可控的旅游业规模，并且旅游业在经济中所扮演的角色可归为“城市现象”；进而，它需要充分的治理过程、政治和工具以减少其对城市组织以及城市宜居性的影响。“智能城市”的兴起，为我们提供了一个重新思考当前政府机制和城市规划的契机，但需要进行整体的研究，超越目前仍在智能城市（经济、流动、环境、人、生活、治理）组件中流行的单一组件适用于每一部分的方式。

目前，技术组件的流行可能源于其工具的易于扩散性而非过程的创新。促销举措似乎专注于城市品牌，而非促进城市成为能够支撑由旅游业带来的额外城市负载。但新技术应用的潜力可以加强城市政策管理城市旅游、优化城市服务与设施供应的决策作用。然而，智能城市的旅游业似乎集中在提高特定资源的使用，或者更为罕见的城市流动系统的应用程序上。“大数据”和“开放数据”

的革命，在意大利似乎还未能达到希望的结果。允许适当管理行为的可用数据，仍然是参与分析和量化现象所面临的主要困难之一。此外，许多智能城市的排名参考某一组件在其他组件的流行度，未能考虑到城市系统、尤其是旅游业的复杂性。在上述前提下，本文试图阐述旅游业，如何成为城市政策和策略旨在减少其对城市影响的对象。

### 关键词

智能城市、智能旅游、大数据

## 1 INTRODUCTION

This article considers tourism as an urban activity that can transform urban organization. The connection between tourism and urbanity is complex: the city is the physical place where tourist desires and inhabitants needs intersect. This means that cities must to face different demands by offering adequate services and facilities. In this sense, tourist load on the city can compromise its balance, affecting urban quality of life. Nevertheless, present cities aim to promote themselves as tourist destination to increase their competitiveness, and tourism is seldom studied as an intrusive activity because of its indisputable positive economic effects. Since the 80s, the sustainability paradigm has been applied at the tourism sector too, affirming a new tourist model, being more responsible and respectful to hosting communities<sup>1</sup>.

Meanwhile, in the last decades, cities have become one of the preferred tourist destination (Page and Hall, 2003) generating a new form of tourism that can be defined as urban tourism). The presence of cities into the “tourist experience” shows the change that has been increasingly affecting the tourist demand.

Indeed cities have become the “object of tourist desire” as they are the place where more experiences can be lived contemporarily. Urban tourism has developed during the 70s and refers both to travels towards cities or places with high levels of population density and to the time spent, that is shorter than time normally spent for vacation before. In this period, in tourists’ opinion cities become “a perfect destination for a short holiday” (Van Der Borg, et al. 1993) where a large number of attractive factors are concentrated.

According to Tourism Towards 2030, UNWTO’s recently updated, long-term outlook and assessment of future tourism trends, the number of international tourist arrivals worldwide is expected to increase by 3.3% each year on average from 2010 to 2030. This represents some 43 million more international tourist arrivals every year, reaching a total of 1.8 billion arrivals by 2030. Based on available data, UNWTO describes that tourism’s contribution to GDP ranges from approximately 2% (for countries where it is a comparatively small sector) to over 10% (for countries where it is an important pillar of the economy).

Therefore, the competition among cities is more and more based on their capacity of attracting tourist flows, because of the undeniable positive effects on economic development. In Italy, for example, tourism contribution to the gross national product is 130 billion euro (about 9% of national production) and it is assumed as one of the leading sector of investment (WTTC, 2013).

In the last few years, due to the internet spread and the accessibility to the use of new technologies, tourist demand has rapidly changed again<sup>2</sup>. Tourist cities have been called to review their strategies to maintain their attractiveness and to promote their image in a “virtual” dimension too. On the other side, tourists have become more conscientious and active in their role of visitors and city-users.

In this period, the “smart city” paradigm arises asking for a model of city based on efficiency, resilience, sustainability and social equity. The perspective of sustainability, indeed, seems to call for a change or, at least, to a re-visitation of the present models of socio-economic growth, which cannot be defined “sustainable” at all.

---

<sup>1</sup> The Global Observatory on Sustainable Tourism (GOST) initiative was launched by UNWTO in 2004 in response to the growing demand of tourism organizations and stakeholders for a more systematic application of monitoring, evaluating and information management techniques, such as the UNWTO Indicators of Sustainable Development for tourism destinations. These techniques are key tools for the formulation and implementation of sustainable tourism policies, strategies, plans and management processes. In 2013, the first Sustainable Tourism Observatory in Europe under the auspices of UNWTO was inaugurated on the Aegean Islands in Greece. The Monitoring Centre for Sustainable Tourism Observatories examine the environmental, social and economic impacts of tourism in the archipelago and serve as a model to expand the concept to a national level.

<sup>2</sup> Some scholars date at the end of the 90s the beginning of e-Tourism, at first, based on the use of internet to promote cultural heritage of a city. After this first period, the use of internet has radically transformed the phase of travel planning, and then the way to communicate and share information and experiences (Maguer 2011; Kennedy-Eden and Ulrike 2012).

The concept of “smart city”, although more recent, is not less controversial than the sustainability one. It seems to widen the application of sustainability principles to the urban competitiveness, by referring both to the use of information and communication technologies (ICTs) and to the quality of “social capital”. Indeed, the presence of a high quality level of social capital represents one of the main factor of territorial competitiveness and attractiveness.

Caragliu, Del Bo, Nijkamp (2009) stated that a city can be defined smart if «investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance» (p. 178).

Since when in 2011, EU has launched the program “Smart Cities and Communities” to finance European cities that will stand out for cutting consumptions and planning a sustainable development, all the cities aimed to become smart, making the scientific researchers wonder about what urban smartness could really be (Fistola, 2013).

What stands out clearly, is the need of contrasting our present development model to assure a better quality of city-life. Nevertheless, the possibility of realizing the “smart city” model seems to be mainly based on the capacity of deeply changing both the administrators and users lifestyles (La Rocca 2011).

Through these premises, this article by analyzing the relation between tourism and city, try to underline the key-role that urban planning, grounding on a holistic approach to cities’ development, should play in coordinating and integrating urban policies addressed to building up a Smart City.

In the first part, the article focuses on the definition of smart city and smart tourist trying to point out what are the changes occurred. In the second part, referring to Italian situation, the article briefly tries to highlight how some difficulties still arise in collecting tourist data even though “Big and Open Data Revolution” is already started. In the third part, the article attempts to highlight the leading role that tourism activity could assume in the transition to urban smartness.

## 2 SMART CITY AND SMART TOURISM: WHAT IS CHANGING?

“Smart City” seems to be the new dimension towards where every city would like to go. From an urban planning point of view, it is not very clear what is the way to get this new dimension and what actually a “smart city” is. Nowadays, the questions very spread among cities are: how is it possible to become a smart city? Which are the strategic factors to drive the city towards this new dimension? How to promote urban smartness?

To answer these question, the way to drive the urban system towards this “new dimension” (the smartness) a renewal in the urban planning processes and in the present urban tools seems to be needed and reducing urban entropy should be the main target of urban planning (Fistola and La Rocca 2013).

Referring to the systemic approach, cities can be assumed as complex and dynamic systems (Bertuglia e Vaio, 1997) and to minimize their entropy production<sup>3</sup>, they must be properly addressed and governed during their development trends.

Cities affected by high levels of entropy cannot produce an appropriate potential of urban smartness nor support sustainable processes of urban planning. The emergent “smart city” paradigm seems to highlight that, from a town planner point of view, the actual challenge consists in making cities more efficient as

---

<sup>3</sup> Entropy has to be considered as a widespread negative condition of the system, which hinders the positive processes to achieve sustainability and tends to move the system towards trajectories totally different from those expected. For more detail see Fistola R., La Rocca R. A. (2013), “Smart City Planning: a systemic approach”, in proceedings of: The 6th Knowledge City World Summit, Istanbul, September 2013 .

regards better quality of services, reduction of environmental impacts (polluting emissions), and control of energy consumption, by means of innovating technologies (ICTs) capable of supporting the management, monitoring and functioning of cities.

Smart City approach bases on the assumption that technology is part of the system and it is not an additional element in performing urban activities at different levels (economic, social and physical).

In this vision, an intelligent city is the one that, using technological innovation, spends less and in the best way without reducing the quality and quantity of services for citizens and firms. It is able to monitor the phenomena that occur, arise, develop, move and end inside it, because it is a sensitive city (Ratti 2011).

Indeed, definition and approaches to the Smart City have not yet reached a common vision and smart city seems to be more an urban label than an alternative approach to the urban themes (Holland 2008).

As stated by Giffinger et al. (2007), “the term is not used in a holistic way (...) but it is used for various aspects, which range from Smart City as an IT-district to a Smart City regarding the education (or smartness) of its inhabitants”.

Smart city definition		
Hardware centered definition	Emphasis on ITC infrastructures and apps	(Cairney and Speaks, 2000; Washburn and Sindhu 2010)
Social centered definition	Human Capital as core factor	(Partridge, 2004; Berry and Glaeser, 2005);
Technological capabilities and social innovation are combined each other	Smarter communities support the well-being of all citizens	Kanter, R. M., & Litow, S. S. (2009). Campbell, T. (2012), Beyond Smart City: How cities network, learn and innovate, Earthscan, NY.

Tab. 1 Table tries to synthesize the main typologies of smart city definition during the last decade in literature

Even though the combination between the technological component and the social one is coming to catch on, still now two different groups of interest can be identified in defining of the smart city: the industrial and the scientific one.

The first one has major interest in equipping the city by sensors; the second one should point out methods and techniques able for governing urban system (planners should be in this second group). Currently, contributions in literature are mainly oriented to define urban indicators to “measure” whether and how a city is “smart”.

Rarely contributions refer to a holistic vision of urban smartness, a partial vision applied per parts of the system (smart building, smart district, smart street, smart infrastructure, etc.) seems to prevail. On the contrary, a holistic vision should allow positive effects both by technologies and by social capital (Papa, Gargiulo e Galderisi 2013; Fistola 2013).

Indeed, more and more often the availability of a good level of human capital is considered as a factor of competitiveness and territorial capacity of attraction (Florida 2003).

The active role of the human factor (the anthropic system: the urban actors, residents, city users, tourists) is becoming increasingly important also because it can significantly affect the “destiny” of a city, for instance in terms of success or not of a tourist destination.

In this sense, tourism could represent one of the main fields where the real achievement of the possibilities given by the paradigm of smart cities can be tested. On the other hand, the competition among cities has to compare also with the ability that each city (at the administrative level) has in attracting tourist flows and

investments in order to improve the supply system (services and infrastructures), by supporting this via the employment of new technologies.

Big Data and Open Data revolution, if they were real, could represent an indisputable occasion to impose a rapid acceleration within the valuation and interpretation of urban phenomena.

However, they still seem far from being tools actually usable and available, at least in Italy and especially for the tourist sector.

While there are yet some difficulties in sharing data to manage tourism phenomenon in urban areas, the smart city paradigm has also encouraged the Smart Tourism Destination (STD).

Connected to the smart city, this new concept has not been so investigated as to get a shared definition (Buhalis 2014) but, as for the urban smartness, some emerging typologies can be identified as follow:

- apps “information-centered” where the main attention is focused on the number of application that tourist can utilize in visiting the chosen destination (QR codes, virtual guides, interactive maps, etc.);
- apps “tourist-centered” aimed at emphasizing “tourist experience” (Augmented Reality);
- apps “tourist-engaging” that allow tourists to have an active role as “urban sensor” in monitoring urban inefficiency regarding specific services or situation (social media, big data).

All the three typology highlight the leading role of technology, especially social and mobile, in the tourism sector referring to both the supply of specialized services and the ability of tourists to be involved in the urban life.

“Smart city” and “smart tourism” (tab. 2), then, are two strictly connected concepts, if we stress the technological component.

Nevertheless, the UNWTO Assistant Secretary-General, Geoffrey Lipman, introduced smart tourism concept in 2009, during the first Meeting of the UNWTO Tourism Resilience Committee. It was defined as “clean, green, ethical and quality at all levels of the service chain.

A type of tourism able to satisfy the needs for the short-term responses to the economic crisis as well as those one of long term as sustainable development, poverty alleviation and mitigation climate change”.

In the common sense, instead, as for the smart city, smart tourism refers to the use of technology applied to tourism, as already underlined before where preference is given to the number and maybe to the quality of apps available for the tourist use of the city.

On the contrary, smartness paradigm for tourism has to consider the temporary dimension of tourist that are not residents. It has to refer both to their behaviors and to their consumptions that have to be sustainable and restrained, in order that the urban system does not exceed his threshold of carrying capacity<sup>4</sup>, (fig. 1) falling down into the entropy zone (Fistola and La Rocca 2014).

Furthermore, as tourism is a complex activity, smartness applied to tourism has to consider also the supply component that is availability of services and efficiency of destination as a whole.

The spread of technologies like the Internet of Things (IoT), cloud computing, high performance information processing and intelligent data digging, surely has transformed the various sectors of tourism, but there is still a lack of coordination among the various sectors (for instance the public administrative level and private industry).

Tourist cities, still now, “suffer” from the excessive charge generated by tourist activity (Venice in Italy could be the most significant example) and on the side of management of this phenomenon.

---

<sup>4</sup> Carrying capacity refers to the “the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of visitors’ satisfaction” (UNWTO 1981).

Smart tourist profile

- Cultured
- Connected
- Media expert
- Media equipped
- Informed
- Active
- Critic
- Demands high quality level of personalized services
- Shares sentiment and impression by social media
- Dynamical
- Contributes to create his personal tourist experience
- Utilizes the end-user devices in multiple modes
- Prosumer (promoter + consumer)
- Multisensory
- Real time connected
- Sustainability supporter
- Careful about energy consumptions
- Desire to be involved in local life
- More careful towards host population
- Sense of responsibility

Smart tourist city characteristics

Organizational level:

- coordinates all relevant information to make it accessible in real time;
- engage with local communities, tourists and government in cocreating tourism experience;
- Organizational agility, speed decision making and responsive to customers' needs based on just-in-time insights

Government level:

- Engagement in data openness process;
- assurance of data privacy;
- coordination among administrative levels;
- activation of public-private partnership;
- integration of tourism in governmental urban processes and tools;
- safeguard and promotion of heritage and culture;
- active involvement of residential and local population in promoting urban culture and .
- provide for network infrastructures;
- planning of sensor network and its feature;
- disposing of interoperable social platform;
- control of energy and resources consumptions
- balance between integrating information for the common good and protecting privacy
- capability of create sustainable solutions that reduce costs
- reduction of social conflicts

Tab. 2 Smart tourism and smart tourist city characteristics (re-elaborated from Buhalis et 2014 )

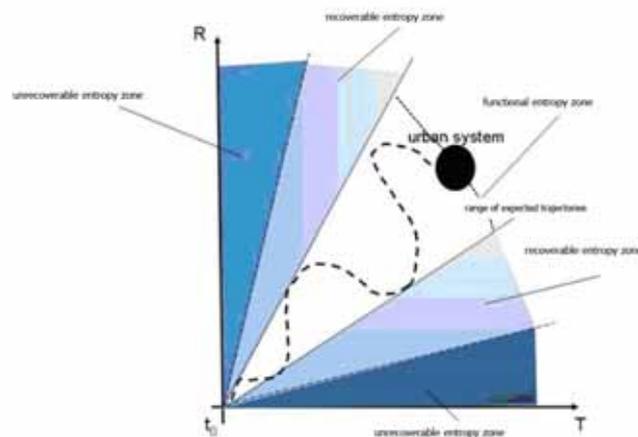


Fig. 1 The evolution trend of the urban system can be diverted by external forces (tourism uncontrolled load for instance) that could make it falling into entropy zone. The process of government of the urban system aim at maintaining it within the angular range of trajectories expected

Smart tourism, thus, concerns both demand and supply and has to consider tourist behaviors as well as private sector (tourist operators) and public administrators (decision makers).

Tourist demand has change faster than tourist supply especially as concern the administrative level. The Smart Tourist Destination should be the place where these three aspect will merge being supported by technology to both enrich tourist experiences and enhance cities competitiveness (Buhalis 2000 and 2014).

## 2 STATISTICAL DATA VS BIG DATA

The aim of this part is to underline that transition towards urban smartness also bases on availability of appropriate tools and methods. If this condition can be registered at theoretical level it is not enough applied at practical level, at least as it concern Italian situation and mainly the tourist sector.

The main difficulty in the pursuit of objectives aimed at managing the tourist activity in urban areas is the limited availability of data to "measure" the phenomenon in all its components (supply, demand, preferences, behaviors, spending, productivity, etc.). Available data are elaborated by national istitution (Istat, Chambers of Commerce, Banca Italia, Enit, Censis, ecc.).

In Italy, the main surveys on tourism are elaborated by ISTAT (National Statistics Institute) in conformity with the EU Regulation 692/2011 of the the European Parliament.

Reffering to survary site, Istat carries out two surveys on tourism:

- capacity of tourist accommodation establishments;
- occupancy of tourist accommodation establishments.

The first one collects each year, at municipality level, the number of establishments, bed places, bedrooms and bathrooms for hotels and similar accommodation (classified with stars from 5 to 1 or hotel-tourism residences) and the number of establishments and bed places for other collective accommodations (tourist camp-sites, holiday villages, farm houses, youth hostels, holiday dwellings, B&B, etc.).

The second one collects each month, at municipality level, data on arrivals and nights spent by residents and non-residents at tourist accommodation establishments, divided by category of hotels and similar accommodation, and by type of the other collective accommodation establishments. Data are broken down by country of residence in the case of non-residents, and by region of residence for Italian residents. Moreover, it also provides information to calculate the occupancy rates of bed places and bedrooms for hotels and similar accommodation.

In collecting data, Local Authorities play the role of Intermediate Bodies (Provinces or Regions or other Local Authorities responsible for tourism) according to the regional organizational structure, currently referred to three levels (regional, provincial and sub-provincial). In Italy, in fact, Regions have competence and administrative function in tourism sector since 2001 (Reform of Title V, Part 2, of the Constitution and Constitutional law of 18 October 2001 n. 3, Art. 117). Regional administrative organization can vary as they work in autonomy, so data collection, recording, processing, checking and transmission to Istat involve different entities. For these reasons, the process is very long in time and has a "variable geometry" pointing out a dispersive and heterogeneous situation both at administrative and technical level. The impact on disposability, utility and maybe on updating of tourism data is high.

In 2013, Italy endorsed the G8 Open Data<sup>5</sup> Charter and committed in starting action to activate open data availability for all citizen at all social level. At present, this availability is very different among Italian regions

---

<sup>5</sup> Open data refers to both a philosophy and a practice consisting in the free accessibility to information without copyright or other restriction.

and does not contemplate tourist data. Thus, at least referring to tourism, the announced revolution by the Open Government Data Movement in Italy is late to come.

Nevertheless, nowadays, this is still the Italian framework of the official statistics in spite of large opportunities that the “Big Data” revolution seems to offer in moving from “data scarcity to data abundance that is the “data deluge” phenomenon (Heerschap et al. 2014). Big Data are changing radically and rapidly the statistical methods: phenomena are no more the object of the statistical studies needed to be understood by data support, they are “data producer” in the new dimension of the “real time”. From the initial difficulty in collecting data, the new challenge consist in the capability of processing and extract the desired information and converting them into useful information.

Tourism is not out of this revolution. Big data revolution comes from some milestones (Beinart 2014):

digital transaction, i.e. everybody's (resident, tourist, workers, city users, scholars, etc.) daily and usual actions can be tracked because they are associated with a digital apparatus (pc, tablet, smartphone, GPS, electronic card, etc.);

social media: i.e. everybody is on the net in real time sharing opinion each other's (Facebook; Tweeter; Google+, ecc.);

internet of people i.e. net of people sharing opinion on some experience, facilities or services (Tripadvisor, Trivago, Airbnb, Booking.com, etc.);

Internet of things i.e. our common daily use objects are connected each others and can be able to manage themselves.

Big Data refer to multiple contextualized transactions: not only information but context's description and impression. Residents, city users, tourists are “anthropic sensor” both sharing information in the functional space and describing a phenomenon in the physical space. In this sense, private ITCs operators are radically changing their role, becoming “holders” of customers' behaviors.

Researchers of the Collective Sensing associated to the Department of Geoinformatics - Z\_GIS and the Doctoral College GIScience at the University Salzburg, Austria elaborate methods combining traditional data with social data from (Vodafone and Tweeter) to elaborate information about tourist preferences (Beinart 2014). The experimentations refers to tourist flows in Italy during the period November-may 2013 (fig. 1). Elaborations allow to describe tourist preferences (i.e. where they prefer to go and visit, where they prefer to make shopping, how much long will they stay in a destination; if they will stay in more than one destination) and their characteristics (i.e. where they come from, transport chosen, etc.). Tweeter based statistics allow to elaborate a “sentiment analysis” consisting in associating to the tweet a *sentiment* expressed and shared in the net by the tourists during their visit. Models and application of massive new data developed by the group of research Collective Sensing aim at reconstructing the dynamics of complex systems and cities. In this sense, the Big Data challenge could support the decisional phase in the process of governing urban transformation, even if some alarms seem to come by the researchers in statistics and data elaborations. The arrival of Big Data presents new opportunities for official statistics, but also it needs some definition being yet an arbitrary concept for a rather heterogeneous set of new data and information sources coming from many different guises and having many different characteristics.

Some other Big Data application to define the characteristics of tourist demand and to use them in supporting the decisional phase in tourism planning refer to “semantic analysis”. This consists in classifying and interpreting some “no structured text ” (i.e. posts in Facebook, Tweeter and other social media) using technology to elaborate the information. Technology associate a mood to each post and valuate the level of positive or negative sensation expressed by tourist during his experience. This analysis allow to value tourist satisfaction while visiting a monument or taking a lunch or having a walk through the city by considering

their sentiment (enthusiasm, fear, security, expensive, and so on). In the Report on Italy tourist perception, edited in July 2014 by Sociometrica and Expert System using Cogito technology, authors examine about 600.000 post of foreign tourists visiting Italy from April to July 2014. The target of the study is to evaluate the level of perception of Italy trying to individuate the sensible areas where it is necessary to intervene to promote tourism. The analysis points out a positive global score for Italy (more than 70, setting 60 as the minimum threshold for the positive value) but also allows making consideration about the quality level of services. The Report confirm also the general opinion concerning the paradox between the high level of Italian historical heritage and the low capacity in promoting and protect it. (Pompei is perhaps the best-known example, but Agrigento or Paestum such as other archeological Italian areas that would need better planning in promoting their singularities). The innovative contribution of this analysis maybe consists in transforming from a passive to active the role of tourists and get information by their sensations.

The transition from “scarcity to abundance” of data while on one hand seem to offer the solution to the knowledge of complex phenomena acting inside the urban system; on the other hand calls for paying large attention in the interpretative phase such as in the phase of selecting information.

What really could be pointed out is the lack of being able to get these technologies inside the process of governing the urban system (Fistola e La Rocca 2013). The major challenge is not collecting the data from the internet, but converting them into useful tools to understand the complexity of urban phenomena like urban tourism.

### 3 THE ROLE OF TOURISM FOR THE SMART CITY: CONSIDERING ACTUAL CHALLENGES

The Smart City approach might necessarily consider potentialities committed to urban development and tourist promotion according to the physical, functional and social aspects of the urban system. Being a transversal activity, tourism is affected by economic conditions as well as by climatic ones.

Tourism paradox consists in being contextually development factor and element which produces negative effects on urban livability. The challenge that tourist cities have to face consists exactly in their ability to find a balance between promotion and safeguard of their (historical, cultural, architectural, territorial, environmental) resources. From a town planning point of view, this condition requires intervening through actions and policies targeted to the optimization of urban livability

The new way to share experiences and sensations that is radically changing the way of promoting tourist cities must necessarily be considered as part of urban strategies.

According smart city paradigm, tourism can play an active role in:

- promoting resources and attractiveness as system;
- implementing sustainable system of services and infrastructure (energy saving, soft mobility, slow food, etc..).

As stated before, Big Data revolution enables the achievement of the objectives identified in the first action. It may support the decision-making both in the drafting of the strategies to be pursued both in the identification of sensitive areas inside the urban system with priority of intervention in order to improve levels of enjoying city's attractions and to promote unknown urban sites.

The Travel Appeal Index, for instance, has been pointed out to value tourist attraction inside the city or referring to a specific structure. The target is double: benchmark among destinations, and strategy to solve weakness of destination (<http://www.travelappeal.com>). In this field, some scientific in-depth have been developed by the group of research DICAR - University of Cagliari, in South Italy, try to investigate the

opportunities of social media analysis and its georeferentiation in supporting urban planning especially referred to Sardinia territorial context.

Referring to the second group of objectives, it is necessary to point out urban policies able to reduce environmental impact generated by tourist activity, according to the Horizon 2020 indications.

Sustainability in tourist destinations and their monitoring is one of the main lines of action of European policies. The European Tourism Indicator System for Sustainable Management at Destination Level is one of the key initiatives to improve sustainable management of tourist destination. The System is composed by a toolkit, a database and a set of indicators intended to support planning of policies of management of a tourist destination. The indicators are part of an integrated approach to destination management that stresses the importance of collaboration, cooperation, on-going assessment, effective communication, and a holistic perspective (tab. 3). In the first pilot phase, about a hundred of tourist destinations have been interested (Belgium, Bulgaria, Estonia, Finland, Italy, Latvia, Ireland, Romania, Slovakia, Slovenia, Spain, Greece, Scotland, the Netherlands, Lithuania, Croatia, Sweden, UK, Portugal, Turkey ) it ended the last April; the second phase will be ended in the next December including also not UE destinations (Montenegro, Serbia, Albania).

Section of Indicators	Objectives for each indicator
Section A: Destination Management Core Indicators	Destination management Indicators emphasize important decision -making and communication issues that contribute to sustainable tourism management in the destination
Section B: Economic Value Core Indicators	Economic value indicators help track the contribution of tourism to economic sustainability in the destination.
Section C: Social and Cultural Impact Core Indicators	Social and cultural impact indicators focus on the effects of tourism on the residents and cultural heritage in the destination.
Section D: Environmental Impact Core Indicators	Environmental impact indicators focus on those elements that are critical to the sustainability of the natural environment of the destination.

Tab. 3 Core Indicators of the European Tourism Indicator System

Referred to a specific component of tourist supply, in 2011, the UNWTO has developed the Hotel Energy Solutions (HES) in collaboration with a team of United Nations and EU leading agencies in Tourism and Energy. The project is aimed at supporting Small and Medium Enterprises (SMEs) in the tourism and accommodation sector to increase their energy efficiency and renewable energy usage.

If these initiatives, on the one hand, show the commitment undertaken at Global and European level to reduce the impacts of the tourism sector on the environment; on the other hand, they invite some reflection about the need for coordination between different actors involved in promoting tourist development.

## CONCLUSION

This article has tried to put in evidence how tourism is becoming an urban phenomenon and in this sense, it should be integrated within the process of govern the urban system. The emerging paradigm of “Smart City” can be an opportunity to reconsider the current mechanisms of government and planning of the cities, but it needs a holistic approach that goes beyond the one applied *per parts* that still seems to prevail in the

declination of the components of urban smartness (economy, mobility, environment, people, living, governance). At present, the technological component seems to prevail, probably due to the ease of diffusion of the instruments, rather than an innovation of the processes. Tourist promotion initiatives seems to concentrate chiefly on the city branding, rather than on plans to make cities able to support an additional urban load expressed by the tourism demand.

Yet, potentialities of technologies are still weak in supporting the decision-making phase of the definition of appropriate plans of actions aimed at optimize the effect of an well-oriented and sustainable urban tourist development that could implement the “urban smartness”. The urban tourist dimension seems to be still considered as “other”, namely not integrated in the urban processes to drive the evolution trend of the urban system towards compatible states of development. Although tourism plays a major role in the management of cities as both instrument and outcome of policy (Ashworth and Page 2010), its planning and management is far to be considered as part of town planning objectives. What this article tries to underline, maybe in a critical vision that should be further investigated beyond this limited context, refers to the observation that neither the new emergent smart city paradigm has overtaken the partial vision that privilege the vision of tourism as economic activity. In this sense the smartness achievement remain closely relied to the capacity of promoting cities (its cultural heritage, its historical resource, its monuments, etc.) rather than to provide for adequate measures enabling the city to contain tourist fluxes according adequate town planning design.

Difficulties in availability of tourist data, even though open and big data era is already started, hamper any control on tourism phenomenon and its dimension in urban areas, especially referred to fluxes activated by occasional events or periods.

The characteristics of smart tourism destination that have been listed in the previous pages represent the attempt of individuating some “fields of application” that could permit to reach urban smartness for the whole system.

Present cities, besides, are expected to become megalopolises with millions of inhabitants and to govern the inevitable change of these large urban systems, it will be necessary to have more direct administrative powers. The coordination among local authorities, thus, will represent one of the core factors for finding solutions capable of coping with these urban dimensions. What stands out, maybe in hidden way yet, is the assertion of a society model that is more exigent about the procedures of the decision-makers. Nevertheless, such a social dimension should be ready to modify its lifestyles in order to reach “smart” livability. The transition to smart city, therefore, needs the integration between policy goals and common lifestyles. Furthermore, urban systems being in entropic states cannot develop urban smartness (Fistola La Rocca, 2013). This consideration should push to evaluate the copious number of initiatives labelled as “smart” that did not lead to any improvement of urban life.

A first attempt to define preconditions for the development of smart city could refer to the systemic approach considering city into three subsystems: physical, functional, and socio-anthropic. Each subsystem could contain structural elements that may allow the evolution of the urban system into smartness conditions (Fistola 2013).

Smart dimension necessarily involves a review of the processes for the governance of the urban system. Within this dimension, ITC technologies play a primary role that need to be supported, optimized, improved and integrated with urban process of government. In the transition toward the smartness, technology has to be adopted and not added up in the urban evolution process, this means that technologies have to be integrated into the development process towards the urban smartness, they have not to be intended as an

additional equipment (like detectors) to the physical system of the city. In this sense, technology is meant as one of the key-factor for the smart city.

By the use of ICTs technologies, residents, tourists and city-users can act a dynamic role in monitoring urban functioning permitting to reduce the lack of efficiency if properly integrated with decisional levels that should be well structured to adopt and elaborate information into action plan.

The concept of “smart city” has large potentialities: it is also a challenge for those cities living in structural levels of crisis. Academics, technicians, administrator must work hard not to let it be just a slogan. This could be a good starting point to reflect about smartness of present cities. But, further research is needed to expand the theoretical contributions of this research as well as to validate its findings.

## REFERENCES

Ashworth G. and Page S.J. (2010) *Urban tourism research: Recent progress and current paradoxes*, Progress in Tourism Management, Elsevier

Beinat E. (2014) *Turismo al tempo dei Big Data*, speech della lectio on <http://www.slideshare.net/MiBACT/turismo-al-tempo-dei-big-data>.

Bertuglia C.S. - Vaio F. (1997), *La complessità: significato ed interpretazioni*, in: *La città e le sue scienze*, vol. 1: *La città come entità altamente complessa*, FrancoAngeli, Milano.

Buhalis, D. (2000). *Marketing the competitive destination of the future*. *Tourism Management*, 21(1), 97–116.

Buhalis D. and Amaranggana A. (2014) *Smart Tourism Destinations*, Xiang, Z., Tussyadiah, I., (eds) *Information and Communication Technologies in Tourism 2014*, pp.553-564. Available at: <http://www.buhalis.com/buhalis/page/publications.htm>.

Campbell, T. (2012), *Beyond Smart City: How cities network, learn and innovate*, Earthscan, NY.

Caragliu A., Del Bo C., Nijkamp P. (2009) “*Smart City in Europe*”, *Journal of Urban Technology* Vol. 18 N. 2, Routledge

European Tourism Indicator System available at [http://ec.europa.eu/enterprise/sectors/tourism/sustainable-tourism/indicators/documents\\_indicators/eu\\_toolkit\\_indicators\\_en.pdf](http://ec.europa.eu/enterprise/sectors/tourism/sustainable-tourism/indicators/documents_indicators/eu_toolkit_indicators_en.pdf)

Fistola, R., and La Rocca, R. (2014). *New Technologies for Sustainable Energy in the Smart City: the WET Theory*. *Tema Journal Of Land Use, Mobility And Environment*, 7(1), 29-42. doi: <http://dx.doi.org/10.6092/1970-9870/2267>. Available at <http://www.tema.unina.it/index.php/tema/article/view/1460/1618>.

Fistola R., La Rocca R. A. (2013), “*Smart City Planning: a systemic approach*”, in *proceedings of: The 6th Knowledge City World Summit*, Istanbul, September 2013.

Fistola R., La Rocca R.A. (2013) “*Un’occasione per rivedere i compiti della pianificazione urbana*”, Sbetti F., Rossi F., Talia M., Trillo C. (eds) *Città come motore di sviluppo del Paese*, UrbanisticaInformazioni, Inu edizioni, Roma. Available at <http://www.urbanisticainformazioni.it/Il-governo-della-citta-nella-contemporaneita-la-citta-come-motore-di.html>

Florida, R. (2012) *The Rise of the Creative Class, Revisited*, Basic Books.

Floris R. Campagna M. *Social Media Geographic Information in Tourism Planning*. *Tema Journal of Land Use, Mobility and Environment*, [S.l.], mag. 2014. ISSN 1970-9870. Available at <http://www.tema.unina.it/index.php/tema/article/view/2501/2518>.

Giffinger, R.; Fertner, C.; Kramar, H.; Kalasek, R.; Pichler-Milanovic, N.; Meijers E. (2007), *Smart cities. Ranking of European medium-sized cities*, Final Report, Centre of Regional Science, Vienna UT. Available at: [http://www.smart-cities.eu/download/smart\\_cities\\_final\\_report.pdf](http://www.smart-cities.eu/download/smart_cities_final_report.pdf)

Graham S. - Marvin, S. (1997), *Telecommunication and City: Electronic Spaces, Urban Places*, Routledge, London.

Holland, R.G. (2008), *Will the Real Smart City Please Stand Up?*, *City*, 12(3), 303-320.

Kennedy-Eden H. and Ulrike G. (2012) *A Taxonomy of Mobile Applications in Tourism e-Review of Tourism Research (eRTR)*, Vol. 10, No. 2, 2012 <http://ertr.tamu.edu>.

Heerschap N., Ortega S., Priem A. and Offermans M. (2014) *Innovation of tourism statistics through the use of new big data sources*, 12th Global Forum on Tourism Statistics, Prague 15-16 May 2014. Available at <http://www.tsf2014prague.cz>

Kanter, R. M., & Litow, S. S. (2009). *Informed and interconnected: A manifesto for smarter cities*. Harvard Business School General Management Unit Working Paper, 09-141. Available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1420236](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1420236).

La Rocca, R.A. (2001) *Sviluppo turistico e governo del territorio: elementi per la definizione di ipotesi di compatibilità*, XXII CONFERENZA ITALIANA DI SCIENZE REGIONALI, [www.aisre.it](http://www.aisre.it).

La Rocca, R.A. (2003), *Turismo turismi e città*, Dipartimento di Pianificazione e Scienza del Territorio Università degli studi di Napoli Federico II Collana Dottorato e Giovani Ricercatori n. 2/2003, Giannini Editore Napoli.

La Rocca, R.A. (2011) *Mobilità sostenibile e stili di vita*, *Tema Journal of Land Use, Mobility and Environment*, [S.I.], v. 4, n. 2, lug. 2011. ISSN 1970-9870. Available at: <http://www.tema.unina.it>, doi:<http://dx.doi.org/10.6092/1970-9870/438>.

Maguer, A. (2011), *Comment les nouvelles technologies valorisent elles le séjour touristique ?*, *Institute d'Aménagement de tourisme et d'Urbanisme*.

Papa, R., Gargiulo, C. e Galderisi A., (2013) "Towards an Urban Planners Perspective on Smart Cities", *TeMA Journal of Land Use Mobility and Environment*, vol 6, n. 1(2013) *Smart Cities: Researches, Projects and Good Practices for the City*, DICEA – Università degli Studi di Napoli Federico II, <http://www.tema.unina.it>

Preiti A. (2014) *Rapporto sulla percezione dell'Italia Turistica. Analisi semantica dei post in lingua inglese pubblicati sui social media*, *Sociometrica / Expert System, Tecnologia Semantica Cogito*. Available at [https://www.academia.edu/7664239/1.\\_Rapporto\\_sulla\\_Percezione\\_Turistica\\_dellItalia](https://www.academia.edu/7664239/1._Rapporto_sulla_Percezione_Turistica_dellItalia).

Petrei F. and Santoro M. T. (2014) *Tourism statistics and the business register in Italy: a comparative analysis and future outlooks for integration*, 12th Global Forum on Tourism: THEME 2 "business registers: the cornerstone of a high quality system of tourism statistics". Available at <http://www.tsf2014prague.cz>.

Ratti C., Biderman A., Outram C.,(2011) *SENSEable Cities- Das digitale Netz der Stadt*", in *Stadt Bauwelt*, 69-75.

Sanchez Chillon P. (2012) "From Vacation Spots to Smart Destinations: technology and tourism, qr, apps and augmented reality for cities", *Urban 360°*, <http://www.urban360.me>

Taewoo, N., Pardo, T. (2011), *Conceptualizing Smart City with Dimensions of Technology, People, and Institutions*, *The Proceedings of the 12th Annual International Conference on Digital Government Research*. Available at: <http://dl.acm.org/citation.cfm?id=2037602>

TDLab Turismo Digitale Ministero dei Beni Culturali e del Turismo, *Interoperabilità e Big Data*. Available at <http://saperi.forumpa.it/story/87492/turista-e-cittadino-progettare-la-smart-city-un-ottica-turistica>.

UNWTO Hotel Energy Solutions (HES) available at <http://hotelenergysolutions.net/>

Van der Berg et al. (1993) *Upcoming destinations of urban tourism*, CISET n. 1.2/95, Venezia, 1995.

WTTC (2013), *Travel & Tourism Economic Impact 2013*, World Travel & Tourism Council, London, UK.

## IMAGE SOURCES

Cover image is from <https://www.flickr.com>; other images, tables and schemes have been elaborated by the author.

## **AUTHOR'S PROFILE**

Rosa Anna La Rocca

Architect, PhD in Urban and Regional Planning, researcher at the Department of Civil, Architectural and Environmental Engineering (DICEA) - University of Naples Federico II. Her research activities refer to the analysis of phenomena that can change urban organization and they are focused on the study of three main relationships: tourism and town planning; land use and mobility, innovation technologies and urban transformations.