

Lecture Notes in Civil Engineering

Daniele La Rosa  
Riccardo Privitera *Editors*

# Innovation in Urban and Regional Planning

Proceedings of the 11th INPUT  
Conference—Volume 1

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Volume 146

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Daniele La Rosa · Riccardo Privitera  
Editors

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*Editors*

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# Preface

The 11th Edition of the International Conference focuses on how to integrate nature-based solutions in urban and regional planning processes and science. Previously planned for September 2020, due to the COVID-19 pandemic the INPUT 2020 Conference will be hosted in 8–10 September 2021 by the University of Catania (Italy).

The overarching theme of INPUT 2021 edition is “Integrating Nature-Based Solutions in Planning Science and Practice”. There is growing evidence that nature-based solutions (NBS) are strategic instruments to restore or improve the functionality of urban ecosystems towards more livable, healthier and resilient cities. Despite their many advantages, NBS are not widely implemented because the evidence of their effectiveness is not yet sufficiently diffused among policy-makers, city-planners and residents and because NBS are often overlooked due to the complexity of their design and lack of normative instruments supporting planning choices. In order to permanently incorporate NBS into planning instruments, more research and international discussion are required to consolidate the fragmented evidence that NBS can significantly improve the overall degree of environmental sustainability of contemporary cities.

INPUT 2020 gathers international scholars in the fields of planning, civil engineering and architecture, ecology and social science, to build and consolidate the knowledge and evidence on NBS and to help an efficient implementation and replication of solutions.

The INPUT 2020 Conference hosts 14 thematic sessions, namely:

- Enhancing the use of nature-based solutions in urban planning
- Modelling to innovate planning solutions for socio-ecological systems
- Input visions: new technologies, data and hybrid models for spatial planning
- Urban metabolism and simulation for decision-making in spatial planning
- Performance-based planning
- Computational planning
- Geodesign for informed collaborative spatial decision-making

- Planning and design of ecosystems services: assessment frameworks, models, mapping and implications
- Green infrastructure for planning healthy urban environments
- The mitigation of peripheralization risk in urban and regional planning
- Strategies and actions for climate change adaptation and mitigation in mediterranean regions
- Analysis and planning of rural landscapes
- Accessibility in urban planning: moving towards innovative approaches
- Maintenance, upgrading and innovation in cultural heritage

This book presents the first collection of 69 contributions submitted to the INPUT 2020 Conference, following the first call for paper launched in Winter 2020. The accepted articles, after a blind-review process, are here organized in 5 topical parts, which group together the 14 thematic sessions of the conference:

- Nature and Ecosystems for Urban Systems
- Models and Technologies for Spatial Planning
- Climate Change and Spatial Planning
- Peripheries, Rural and Cultural Landscapes
- Accessibility in Urban Planning

INPUT 2020 proceedings explores empirical as well as theoretical frameworks for NBS, their attitude to provide ecosystem services, to deal with climate change effects and to support mitigation and adaptation planning strategies. Integration of NBS in planning science and practice is investigated across different contexts and scales, from urban cores to peripheries as well as from rural to cultural landscapes. Above all, this collection presents the state of the art of modelling approaches and innovations employed in urban and spatial planning, with a trans-disciplinary, boundary-less character to face the complexity of contemporary socio-ecological systems and following a practice-oriented approach aimed to problem solving.

INPUT is a group of Italian academic researchers and academics working in different fields related to the exploitation of innovation for urban and regional planning, with particular reference to geo-informatics and socio-ecological aspects of spatial planning. INPUT Conference is held every two years in Italy, with last editions been hosted in Viterbo (2018), Torino (2016), Cagliari (2014) and Potenza (2012).

INPUT 2020 Conference is organized by [LAPTA](#), a research laboratory of Department of Civil Engineering and Architecture of the University of Catania (Italy), working on sustainable urban and landscape planning.

Catania, Italy  
December 2020

Daniele La Rosa  
Riccardo Privitera

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Among his scientific interests in the field of urban and regional planning are included: sustainable urban growth, non-urbanized area planning, urban green infrastructures, urban quality, green cities, climate change adaptation and mitigation strategies, ecosystem services, land cover analysis, urban morphology analysis, land suitability analysis, urban and peri-urban agriculture, farmland protection, real estate development processes, transfer of development rights, renewable energy sources and energy efficiency issues at urban scale. Based on these topics, he published more than fifty among scientific papers, proceedings, chapters and books.

# **Accessibility in Urban Planning**

# Urban Accessibility and Tourist Activity: An Application to the Metropolitan City of Naples



Rosa Anna La Rocca

**Abstract** Accessibility, until now, has been a wide concept concerning different sectors mainly connected with the sciences of transport, economy, and urban geography. Among several definitions of accessibility, the most shared refer to the possibility that an individual has, to participate in one or a set of activities in a given place. In general, accessibility also refers to the characteristic of a service or of a resource to be easily enjoyed by a large number of users and this relies on the capacity of a city or a region to guarantee high levels of quality of life. Accessibility, thus, aims at improving the comfort of urban spaces for all users assuring the same opportunities for all. In this sense, accessibility also takes into account social aspects. Tourism, and activities linked to it, by definition, are based on at least two types of movement: a long-range movement to reach the destination from the point of origin: a close-range movement to carry out the tourist activity itself (visit, have fun, eat, reside). The issue of urban accessibility particularly relates to tourism activities if we consider that tourism requires several services which are not exclusively related to mobility. In these concerns, the study aims to define an accessibility index particularly referring to tourist services. The method pointed out in the theoretical part of the study has been tested on the metropolitan city of Naples (MCN). The results provide a potential source of information to support decision makers in pinpointing interventions to improve the accessibility of services at the metropolitan scale.

**Keywords** Urban accessibility • Tourist activity • Metropolitan City of Naples • Tourism destination • Tourism destination accessibility • Cultural tourism territorial use

## 1 Introduction

The concept of accessibility cannot be exclusively related to the physical mobility demand generated by the need of doing urban activities in a certain urban area.

---

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To understand the meaning of accessibility, it is also necessary to consider it as connected to the quality of urban spaces. In the context of this study, accessibility has been defined as a usability condition able to assure high levels of urban quality.

The quality levels are expressed both by the variety and efficiency of the system of services and facilities as well as by the possibility that users and residents have of enjoying these services and facilities without compromising the management of their own time. In this sense, accessibility is the opportunity that each user has, to join a physical space and completely enjoy this space. This condition becomes indispensable and particularly important when referring to tourism, also because accessibility represents the principal element in the choice of destination. In this regard, accessibility is also connected to attractiveness and, thus, to the level of competitiveness of a destination.

## 2 Definitions and Point of View of the Research

The classic definition of accessibility refers to the measurement of the ease with which a person can reach a destination (Hoepli 2020). In the context of this study, accessibility also has the meaning of giving the possibility of enjoying and at the same time reaching a destination. In this regard, it has been accepted that accessibility can also be intended as an indicator of the quality of the supply system present in the destination. Many definitions have been given for accessibility within the scientific literature (Table 1) even though its definition has not yet been universally agreed upon.

Scholars (Papa et al. 2018) have joined consensus around the differences between active accessibility and passive accessibility. In the first case, who makes the action is in an active position; in the second case, there is a passive condition. In the first case, accessibility is the condition to join a destination, in the second case accessibility is the condition for a destination to be reached. It must also underline the relationship between mobility and accessibility, often meant as synonymous. Accessibility, instead, cannot be defined as collateral for the demand of mobility and the supply of transport. The presence of an efficient transport network cannot be a guarantee for good levels of accessibility; on the contrary, it is possible to have good accessibility in the absence of a transport network. In this regard, accessibility and mobility not only are not synonymous but they can even have an inverse relationship. While mobility measures the distance (how far you can go in a given time), accessibility measures the ease of movement (how many useful or valuable things you can do). Some scholars (Litman 2008) specified this difference, asserting that mobility refers to the movement of people and goods from one place to another, while accessibility refers to the involvement of the person who joins the destination not only physically but also by enjoying being in that place. It is quite understandable that regarding this interpretation, the attention has shifted from the physical dimension to the persons' feelings and to their freedom of choice. In this

**Table 1** Different definitions of accessibility within the scientific literature

Boffi (2020)	Defined 5 dimension of a.: 1. Geographical and territorial 2. Economic 3. Engineering 4. Temporal 5. Social
Tocci (2010)	Delineated a. as the quality of the space concerning mobility
Cass et al. (2005)	Defined a. as the individual ability to use a space for personal purposes
De Rubertis (1994)	Defined a. as the condition of a place and at the same time of being an attractor of people and activities
Hannerz (1992)	Expressed the need of differentiating a different way of accessibility connected to the individual way
Lynch (1970)	Defined a. as one of the main elements for testing the efficiency of the system of services
Ingram (1971)	Recognized two kinds of accessibility: relative accessibility referred to the connection between two points within the same surface; and the integral accessibility referred to the connections among one point and all the other points present within the same surface
Lefebvre (1970)	Defined a. as “Right for the city”
Hansen (1959)	Defined a. as the opportunity of connections which relied also on the concept of freedom and possibility

sense, accessibility is linked to the subjectivity of the one who chooses the possibility of moving to reach the destination they desire.

This is particularly significant when referring to tourist activities that depend both on the possibility of traveling and visiting, and on the choice of the destination. Taking these considerations into account, the present study tries to map tourist accessibility in the Metropolitan City of Naples.

### 3 A Tourism Destination Accessibility Model and the Scientific Literature Framework

Distance decay is an especially important concept in tourism studies. It describes the inverse relationship between the interaction among localities and their distance. Distance indeed has impacts on tourist demand and, thus, on the attractiveness of a tourist destination. Some scholars (McKercher and Lew 2003) demonstrated the importance of distance considering Visiting Friends and Relative (VFR) tourism. In a spatial sense it is also important to consider the existence of Effective Tourism Exclusion Zones (ETEZ) that are characterized by an extremely low attractiveness for tourism (McKercher et al. 2008; Lee et al. 2012). The research in this field has

shown that there is a strong correlation between distance decay, destination attributes, and the tourists' motivations.

According to these considerations, the assessment of the effects on income and price, as well as the individualization of destination attributes and types of tourism is fundamental for defining a territorial accessibility index for tourism. Some scholars (Martin and Witt 1987) separated two entities: the cost of travelling to a destination and the cost of living at the destination but they did not arrive at a concrete definition. This difficulty is present inside the literature (Kliman 1981; Crouch 1992) and many studies have used the Consumer Price Index even though this is not a solution as it depends on its applicability. In this study, and at the present stage of the research, the costs of staying in the destination have been calculated based on the relationship between the average stay in the destination and the tourist tax for staying imposed by municipalities. Referring to the definition of destination attractiveness, increasing interest in the literature has been dedicated to its measurement and definition since the Nineties. Some scholars (Zhang et al. 2011) give a review of the methods to assess Tourism Destination Competitiveness (TDC) considering attractiveness as part of the competitiveness of a destination and underlining the difference between the subjectivity and the objectivity in the definition of TDC (Dwyer and Kim 2003). The core resources and attractors, in fact, are considered as the essential elements of destination appeal. Some scholars (Crouch and Ritchie 1999; Crouch 2011) classify these elements by also considering the type of tourism that they can interest (Economic, Cultural and recreation, Specific Purpose) and conclude that from the literature it could be inferred that culture is the core of tourism and that there is a positive correlation between wealth, age, distance, and the desire to undertake cultural tourism. By using the interpretation elaborated by Hooper (2015) that refers to the original Von Thunen location rent formula (Sinclair 1967) a proposal for defining a tourism destination accessibility model can be expressed by the formula:

$$A_j = Q \cdot (at_j - c_j) - \frac{1}{Q}t_j + e \quad (1)$$

$A_j$  = accessibility of the  $j$  destination

$Q$  = quality of leisure defined as the ability to meet tourist needs

$at_j$  = attractors, amenities, and ancillary services variety in the  $j$  destination

$c_j$  = average costs for stay and local tourist tax in the  $j$  destination

$t_j$  = average time in minutes to join the destination from the principal nodes of transport (airports, ports, train stations)

$e$  = economic benefit.

In Eq. (1) accessibility is expressed both by the attributes of the destination itself, by the friction of distance, and by the economic benefit, if generated. In Eq. (1)  $Q$  is calculated concerning the destination attributes, especially referring to the opportunities that the destination offers to tourists. This term will also depend on the

characteristics of the type of tourism. The second part of Eq. (1) can be defined as the cost of the distance in time. It has been calculated considering the achievability of the destination by using local transport.

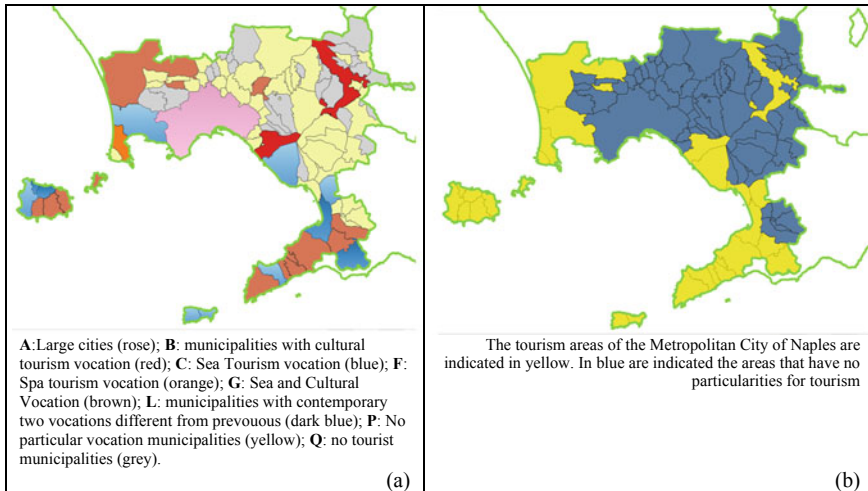
#### 4 Testing the Tourism Accessibility Model in the Metropolitan City of Naples (MCN)

The MCN is one of the largest in Italy, with about 4 million inhabitants and a population density of about 2632 inhab./km<sup>2</sup>. Its borders coincide with the Naples provincial territory which is characterized by high levels of unplanned urban expansion causing a wide level of fragmentation, extensive illegal urban development, and incorrect use of the rural surface. This area is made up of 92 municipalities. Despite its internal incoherence, the MCN is also characterized by high levels of environmental, archeological, and territorial resources that make it unique and universally known as one of the most popular tourist attraction areas in the world. According to a strict tourism view, this area has some specific poles in which tourism flows concentrate and other areas that are outside of tourism despite their relevant resources. These areas can be classified as Effective Tourism Exclusion Zones (ETEZ) and as shown in Fig. 1 they have been individuated considering the classification<sup>1</sup> of Italian municipalities elaborated by ISTAT in 2020 (Istat 2020). According to the ISTAT classification, in MCN, 26 municipalities are no tourist (Q), 37 have no particular tourist vocation (P), 4 are municipalities with contemporary two different vocations (L), 7 have cultural and sea vocation (G), 1 has spa vocation (F), 14 are sea vocation municipalities (C), 2 are municipalities with cultural vocation, only 1 is the large city (A) coinciding with Naples, there are no municipalities for the D, E, and H categories (Fig. 1).

Even though in some cases it is quite hard to agree with the ISTAT classification, at the present stage of the study it has been used as a reference. Considering that areas classified as “Q” and those classified as “P” have not been signed as tourist destinations, the metropolitan tourist city of Naples (MTCN) could be considered of being composed of 29 municipalities of the total 92.

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<sup>1</sup>The Italian law 77/2020 connected to the Covid-19 emergency, provided for a classification of the economic activities linked to tourism. The classification considers the areas with high level of tourist density (tourist presences on territorial surface) and of the tourist load (tourist presences and number of residents). Istat elaborated 10 categories of municipalities individuated on the basis of their geographical characteristics and imposing some conditions (i.e.: for mountains municipalities the altitude of the inhabited center over 600 m; coastal areas if on the sea or if not bordering with the sea it has at least 50% of the municipal area at a distance from the sea equal to or less than 10 km; a municipality located on the coast of a lake or having at least 50% of the surface at a Euclidean distance from the lake edge of less than 3 km is considered a lake-tourism destination; cultural destination are defined on the basis of a set of variables linked to cultural attributes).



**Fig. 1** The Istat classification in MCN (a) and the MTCN selection (b)

Due to its predominant role, the municipality of Naples has not been considered in this phase, as its presence could stress the results of the ranking (Fig. 1).

Table 2 indicates the articulation of the dataset considering variables for both the supply side and for the demand side.

## 5 First Results and Conclusions

As a first result, a classification of the MTCN was developed using the GIS techniques. It must be specified that some more in-depth analysis is needed to verify the results. Anyway, at present some considerations can be made, referring to the classifications obtained. Within the tourist areas of the MCN, some destinations show the prevalence of the coastal locations as the least accessible (Fig. 2a). As it was expected, these areas coincide with the most famous tourist destinations of the Sorrento Peninsula and the three islands of the Gulf (Capri, Ischia, Procida) in which it is particularly expensive to get there and to stay there. The classification, when referring to the quality indicators, shows an uneven distribution that often does not correspond with the previous images.

Figure 2b shows that some of the most expensive destinations do not guarantee high levels of quality when referring to the condition to reach the destination itself, in terms of minutes and distance or of the variety of attractors present in it.

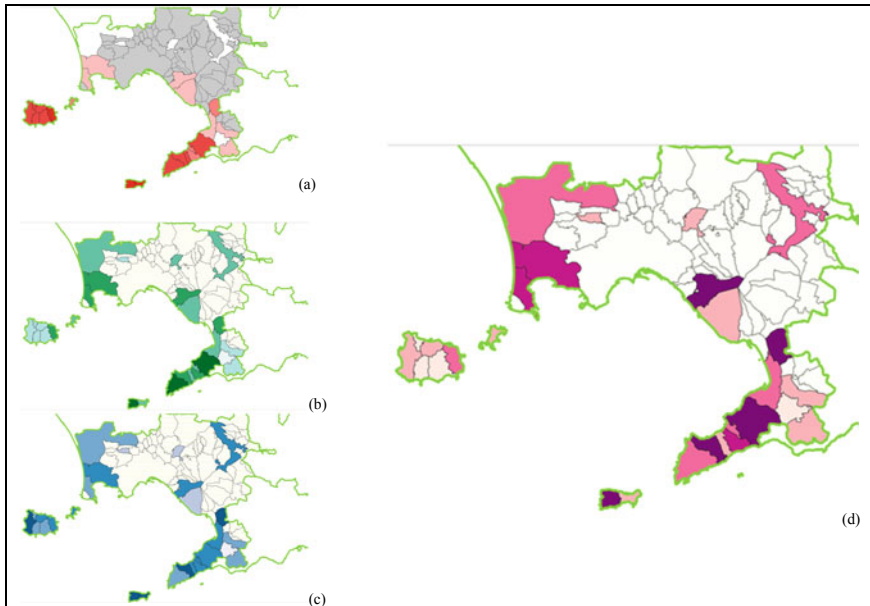
Figure 2c shows areas that are considered attractive within the MTCN. The map highlights that almost all the destinations are considered to have a good level of attraction, even though, as expected, high levels of attractiveness characterize the municipalities of the islands and the Peninsula.

**Table 2** The data set structure

<b>1 Territorial elements of the present supply for cultural tourism use (independent variables)</b>	
– Attractors and amenities	
▪ <i>Total accommodation capacity</i>	n
▪ <i>Number of total accommodations</i>	n
▪ <i>Number of international museums, archeological sites, and others cultural attractions visitable with a long opening time (from 8 to 12 h)</i>	n
▪ <i>Orange flag historical center</i>	Binary
▪ <i>Presence of restaurants with Michelin stars</i>	Binary
▪ <i>Presence of UNESCO heritage sites</i>	Binary
▪ <i>Presence of the municipality on Airbnb portal</i>	Binary
▪ <i>Presence of historical paths crossing the municipality territory</i>	Binary
– Average costs for stay and local tourist tax	Euro
– Average cost of daily ticket for public transport	Euro
– Number of connections (railway, bus, and naval) a day with the capital	n
– Distance from the principal airports	km
– Distance from the principal ports	km
– Presence of high-speed station	Binary
– Distance from the principals high-speed stations	km
– Presence of almost 1 motorway exit	Binary
– Distance from the nearest motorway station	km
<b>2 Elements describing the territorial distribution of tourist demand (dependent variables)</b>	
– Total Number of nights spent in accommodation and extra	n
– Average of total stays in accommodations and extra	Ratio
– Total Arrivals in accommodation and extra	n
– Number of visitors in archeological sites	n
– Number of visitors in museums	n

The classification of the global accessibility levels as defined in Eq. (1) is illustrated in Fig. 2d. Some interesting differences can be noted in the distribution of the cases on the territory. Accessibility values are located in the tourist areas of the Peninsulas with irregularity. This is due to the load of the coast in Eq. (1) whose effect weakens the global accessibility level of those areas. As expected, the municipalities that are on the north side of Vesuvius have not got a high level of accessibility due to the time needed to reach them. Some interesting exceptions are localized on the south side of Vesuvius, probably due to their closeness to Naples and, thus, to the main pole of physical mobility (highway, high-speed train station, airport, port). This is in contrast with the tourist characteristics of the area, which in some cases can be quite poor.

The future development of the research will explore more in-depth accessibility conditions to allow the application of multivariate analysis and stress the dependence of variables and their correlations.



**Fig. 2** The value of the cost indicators (a). The value of the quality indicators (b). The value of the attractiveness indicators (c). The map of the Metropolitan Tourist City of Naples Accessibility (d)

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