Chapter 17
The Walkability of the Cities:
Improving It Through the Reuse of Available Data and Raster Analyses

Luigi La Riccia

ⓘD https://orcid.org/0000-0002-4800-2641
Politecnico di Torino, Italy

Antonio Cittadino
Università degli Studi di Torino, Italy

Francesco Fiermonte
Politecnico di Torino, Italy

Gabriele Garnero
Università degli Studi di Torino, Italy

Paola Guerreschi
Università degli Studi di Torino, Italy

Franco Vico
Politecnico di Torino, Italy

ABSTRACT

The issue of city walkability is nowadays a theme in evidence. The chapter proposes a two-level reasoning. At the city level, the goal is to recognize the parts where actions aimed at improving walkability can be more effective. The second level is more detailed: lacking pedestrian paths' specific graphs, the urban space is modeled through a raster with 1x1 m. cells. Considering a series of criteria, an impedance has been assigned to each cell (i.e., the cost of travelling the cell on foot). This approach is applied to the city of Torino (Italy), but it is largely generalizable. To calculate this impedance, inter alia, the Torino geo-topographic database was used. The elaborations described in this chapter are seen as an aid to stakeholders to reason on city walkability and to compare different points of view in an explicit and articulated way.

INTRODUCTION

The walkability of the city has been the subject of consideration for at least fifteen years, but today it is certainly in evidence. In February 2018 the small volume *Pedestrians First* (ITDP 2018) was published, that was inspiring in particular for two reasons: it was conceived in a context and with a vision absolutely global; it has a clear operational objective, to support the different subjects (policy and decision makers,

planners and technicians, pro-active subjects at a local level, etc.) involved in the promotion and planning of the increase of the city's walkability, as a factor of sustainability and growth of the its livability.

The city's walkability theme intersects several relevant current themes. The reasons reported in the literature to deal with it are surprisingly varied, ranging from the sustainability of urban mobility, from soft mobility (recovery of walking as a solution to the problems of transport over short distances), to the health of people (contrast of obesity (Agampatian 2014) prevention of cardiovascular diseases, osteoporosis (Eynard, Melis and Tabasso 2017). In the middle there is a wide range of motivations concerning the livability of the city, security, pollution, urban densification. Some analyzed researches often describe a path that led to the construction of walkability indices, taking into consideration, along with other aspects, such as the physical form of the city and its way of functioning, that is population, building density and the mix of urban activities and functions (which, together, lead to multiplication of possible origins and destinations of movements), security (which concerns both the intersections between pedestrian paths and vehicular routes, that anthropic safety), the pleasantness of the environment (quality of the sidewalks, presence of shops and other activities along the pedestrian paths, presence of green, low level of pollution and noise, etc.).

For people, to decide to get walking a little more, instead (specifically in Italy) to use their car, involves reviewing their own habits and building new mental maps of their city.

If the ultimate goal is to provide views of the walkability of the city, useful for people to reconsider the possibility of walking different areas of the city, and the accessibility of different interest points on foot, the specific objective of this chapter is to demonstrate the possibility of constructing effective views of city's walkability, using existing data, extensible (more or less easily) to the entire urban or metropolitan area, bypassing the lack of specific networks related to foot mobility, which allow municipal technicians and policy-makers to focus on critical points of pedestrian paths, considering all the factors that influence the walkability.

BACKGROUND

Definitions of Walkability

Walkability and accessibility with alternative mobility are conditions for the development of the quality of urban and territorial life, as well as a way to deal concretely with the great issues of the "right to the city" (Lefebvre 1968; Harvey 2008) and the relationship between city and welfare.

In literature, there are many definitions of "walkability". For Abley (2005) *walkability* or *walkable* is "the extent to which the built environment is walking friendly": this definition enables the opportunity for a subjective or qualitative assessment against specific criteria. These criteria may be characteristics such as the "5 Cs": connected, convivial, conspicuous, comfortable and convenient, or other criteria specific to a particular user.

For Seilo (2004), walkability "is a measure of the urban form and the quality and availability of pedestrian infrastructure contained within a defined area. Pedestrian infrastructure includes amenities developed to promote pedestrian efficiency and safety such [as] sidewalks, trails, [and] pedestrian bridges".

Related Content

Digital Transformation and Skill Acquisition: Enablers and Barriers for Today's Workforce
Kateina Maršíkováand Anastasiia Mazurchenko (2022). *Handbook of Research on Smart Management for Digital Transformation (pp. 113-138).*
www.irma-international.org/chapter/digital-transformation-and-skill-acquisition/298426

Managing Crisis Using Interconnected Devices Powered by the Internet of Things (IoT)
Mark Schofield (2022). *Future Role of Sustainable Innovative Technologies in Crisis Management (pp. 13-27).*
www.irma-international.org/chapter/managing-crisis-using-interconnected-devices-powered-by-the-internet-of-things-iot/298927

Evaluating Wireless Network Accessibility Performance via Clustering-Based Model: An Analytic Methodology
Yan Wangand Zhensen Wu (2021). *Research Anthology on Digital Transformation, Organizational Change, and the Impact of Remote Work (pp. 687-699).*
www.irma-international.org/chapter/evaluating-wireless-network-accessibility-performance-via-clustering-based-model/270318

Ontology-Based Modelling of State Machines for Production Robots in Smart Manufacturing Systems
Alexander Smirnov, Nikolay Shilovand Maxim Shchekotov (2022). *Research Anthology on Cross-Disciplinary Designs and Applications of Automation (pp. 429-446).*
www.irma-international.org/chapter/ontology-based-modelling-of-state-machines-for-production-robots-in-smart-manufacturing-systems/291647

Autonomous Surgical Robotics at Task and Subtask Levels
Tamás Dániel Nagyand Tamás Haidegger (2022). *Research Anthology on Cross-Disciplinary Designs and Applications of Automation (pp. 319-338).*
www.irma-international.org/chapter/autonomous-surgical-robotics-at-task-and-subtask-levels/291641