



# Chapter 9

## Semantic Spatial Representation and Collaborative Mapping in Urban and Regional Planning: The OnToMap Community Project

**Angioletta Voghera**  
*Politecnico di Torino, Italy*

**Luigi La Riccia**  
 <https://orcid.org/0000-0002-4800-2641>  
*Politecnico di Torino, Italy*

**Liliana Ardissono**  
 <https://orcid.org/0000-0002-1339-4243>  
*Università degli Studi di Torino, Italy*

### ABSTRACT

*This chapter focuses on the theme of the spatial representation of cities and the territory and the collaborative construction of territorial knowledge. The described research concerns the “OnToMap. Mappe di Comunità 3.0” project, focused on the definition of a methodology that implements a semantic representation of territory. That type of representation supports the description of big and open data and of its properties in a unified language. OnToMap enables the sharing of information on the web by providing an integrated perspective on territorial data, as demonstrated in an experimentation with Ph.D. students of the Politecnico di Torino. OnToMap is also part of the H2020 funded project WeGovNow, based on the integration of GIS tools, VGI practices and Web 3.0 applications: an example of citizens’ involvement in the urban redevelopment process of Parco Dora in Turin, which aims was make more inclusive (in terms of empowerment) and efficient urban planning policies.*

DOI: 10.4018/978-1-5225-7927-4.ch009

## INTRODUCTION

Recent innovations in ICT are significantly changing the technology-society relationship. At the same time, the procedures used to conduct scientific research are being revolutionized by the exponential increase in the amount of available data. This condition is having a profound influence on the methodologies which are used to analyse, study and develop scientific research related to urban planning and primarily concern territorial data usage and, for this reason, are independent from the method used for data processing and mapping. For instance, big data analysis enables to synthetize and include in the used databases data and information that previously could not be treated as data. This information, as well as feeding the necessary knowledge sources for the development of statistical high correspondence analyses, can be related with new kinds of data basins, thus increasing the range of possible applications: it is possible, for example, to build and obtain geo-information regarding flows (people, things and information), perceptions and personal evaluations of specific places and landscapes.

The European Smart City model<sup>1</sup>, meaning the set of strategic actions to make cities intelligent, digital and inclusive, is closely connected to the development of infrastructures devoted to collect and process public administration and social data and to develop communication and social participation. The Smart City concept has been quite fashionable in the policy arena in recent years: compared with the concept of digital city or intelligent city, the main focus is not limited to the role of ICT infrastructure but is mainly on the role of social, economic and environmental issues. There are various different forms of expression of the Smart City in practice: “eGovernment”, or “e-gov” (AOEMA 2005) identifies the possibility to improve the quality, rapidity and reliability of services provided to citizens by public administrations, thanks to the digitalisation of administrative apparatus (Clift 2004). However, this model also refers to *learning communities*, meaning communities focused upon sharing knowledge.

In this area, attention is paid to the use of ICT for sharing geographical knowledge in support of spatial design and urban planning. In line with institutional practices of transferring geographical knowledge on digital media through the construction of Geographic Information Systems (GIS), within web 2.0, new possibilities were configured for citizens to construct geographic knowledge voluntary and spontaneously, using different digital media (Goodchild 2007, 2009).

This chapter presents a reflection about the theme of collaborative production of geographical knowledge by constructing a technical framework at international level, showing a recent experimentation conducted in Politecnico di Torino with the Ph.D. students of Urban Planning course on Urban and Regional Development of the Politecnico and Università degli Studi di Torino. The experimentation was

25 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/semantic-spatial-representation-and-collaborative-mapping-in-urban-and-regional-planning/223707](http://www.igi-global.com/chapter/semantic-spatial-representation-and-collaborative-mapping-in-urban-and-regional-planning/223707)

## Related Content

---

### A Sociotechnical Framework for Smart Urban Governance: Urban Technological Innovation and Urban Governance in the Realm of Smart Cities

Huaxiong Jiang, Stan Geertman and Patrick Witte (2020). *International Journal of E-Planning Research* (pp. 1-19).

[www.irma-international.org/article/a-sociotechnical-framework-for-smart-urban-governance/242924](http://www.irma-international.org/article/a-sociotechnical-framework-for-smart-urban-governance/242924)

### Conceptualization of an Air-Extraction System to Mitigate COVID-19 Transmissions Inside Public Transportation Buses

Omar Eduardo Sánchez Estrada (2022). *Urban Sustainability and Energy Management of Cities for Improved Health and Well-Being* (pp. 32-43).

[www.irma-international.org/chapter/conceptualization-of-an-air-extraction-system-to-mitigate-covid-19-transmissions-inside-public-transportation-buses/303521](http://www.irma-international.org/chapter/conceptualization-of-an-air-extraction-system-to-mitigate-covid-19-transmissions-inside-public-transportation-buses/303521)

### The Role of GIS in City Competitiveness

Khan R. Rahaman and Júlia M. Lourenço (2012). *City Competitiveness and Improving Urban Subsystems: Technologies and Applications* (pp. 35-60).

[www.irma-international.org/chapter/role-gis-city-competitiveness/60102](http://www.irma-international.org/chapter/role-gis-city-competitiveness/60102)

### Creating 3D Models from Sketch Plans for Spatial Landscape Evaluation

Bauke de Vries, Joop van den Tillaart, Kymo Slager, Rona Vreenegoor and Joran Jessurun (2012). *International Journal of E-Planning Research* (pp. 42-55).

[www.irma-international.org/article/creating-models-sketch-plans-spatial/62039](http://www.irma-international.org/article/creating-models-sketch-plans-spatial/62039)

## A Sociotechnical Framework for Smart Urban Governance: Urban Technological Innovation and Urban Governance in the Realm of Smart Cities

Huaxiong Jiang, Stan Geertman and Patrick Witte (2020). *International Journal of E-Planning Research* (pp. 1-19).

[www.irma-international.org/article/a-sociotechnical-framework-for-smart-urban-governance/242924](http://www.irma-international.org/article/a-sociotechnical-framework-for-smart-urban-governance/242924)