

# Chapter 7


## Smart Cities as Open Governance Laboratories: Multidisciplinary Approach From Engineering

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### ABSTRACT

*This chapter addresses smart cities not simply as a technological deployment, but as a space where different branches of engineering complement each other. It analyzes some of the contributions of mechanical, mechatronic, electrical, electronic, computational, and chemical engineering, highlighting how each of them, from its perspective, integrates innovative and preferred factors to make a city more efficient, safe, and, above all, tailored to its inhabitants. It also presents some specific examples of the implementation and management of smart cities and governments, such as Barcelona, Singapore, New York, and Amsterdam. The text details some of the actions these places have taken to become smart. It analyzes how the knowledge*

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*contributed by different branches of engineering articulates with the Internet of Things, electrical grids, and the mechatronic design of smart sensor networks to give rise to innovative systems.*

## **1. INTRODUCTION**

When we hear the phrase “Smart City,” many people immediately think of a complex city due to its use of technology. However, many people fail to imagine the diversity of aspects associated with this concept, and it can be worrying for those unfamiliar with using modern equipment, even as simple as a cell phone. A Smart City is not only the result of the use of technology, but also a new form of urban management. It is a governance model where information circulates openly and transparently, harnessing the potential offered by Information and Communication Technologies (TIC) (Serra et al., 2014). The implementation of the Smart City model enables new forms of collaboration between governments, engineers, academics, and citizens in general, as they can share decision-making within a framework of open governance. Thanks to these changes, cities can be formed in which people experience greater satisfaction with their quality of life, facilitating processes and allowing access to a greater number of resources.

Today, most people live in cities, and in a world marked by accelerated urbanization, the worsening climate crisis, and the growing demand for efficient services, it is necessary to redesign the way urban environments function. The emergence of Smart Cities represents a robust response to these challenges, offering more integrated models focused on people's needs.

In the Smart City model, development is people-oriented and supported by TICs, enabling rapid transformation of various aspects of everyday life, including:

- More efficient public services, such as energy, water supply, health services, public safety, and education, can be managed to some extent with digital technologies.
- Urban planning allows for controlled expansion, respecting the environment and ensuring the ability to provide services to all. It also considers the creation of green spaces, planning for the implementation of efficient transportation, and optimizing mobility through strategic routes.
- Smart mobility, which includes the integration of public transportation and traffic monitoring systems, where priority can be given to vehicles such as school buses, healthcare vehicles, and security vehicles such as police and firefighters.

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