


# Chapter 15

## The Role of Smart City Applications in Creating Sustainable and Climate-Responsive Cities in the EU: The Case of Amsterdam

**Gulnar Bayramova**

 <https://orcid.org/0009-0007-1149-0868>

*The Graduate School, Manisa, Turkey*

**Ahmet Uçar**

*Faculty of Economics and Administrative Sciences, Manisa, Turkey*

### **ABSTRACT**

*The formation of sustainable and resilient cities has become a critical focus in modern urban governance. Rapid urbanization, infrastructure deficiencies, unplanned expansion, and social inequalities challenge the pursuit of sustainability in urban contexts. In response, smart city applications have emerged as effective instruments for addressing these issues. This chapter focuses on the Amsterdam Smart City (ASC) Program as a key case study aligned with EU sustainability goals. Using a literature review and qualitative content analysis, the study explores the impact of ASC's initiatives on environmental and social resilience. It assesses how ASC's multi-stakeholder governance supports sustainability and evaluates specific smart solutions, such as lighting and energy-efficient buildings, in achieving carbon reduction and circular urbanism goals.*

DOI: 10.4018/979-8-3373-1310-8.ch015

## INTRODUCTION

Today, cities are becoming overcrowded and growing in an unhealthy and unplanned manner due to rapid urbanization and intensive migration movements. This rapid population growth has brought with it serious challenges for urban management, adversely affecting economic and social life and leading to a significant decline in quality of life. At the same time, issues such as increasing energy consumption, carbon emissions and overuse of natural resources have made cities both vulnerable and influential actors against climate change. Under these circumstances, urban administrations have had to develop solutions that are not only sustainable but also climate-responsive. At this point, within the framework of the opportunities offered by developments in information and communication technologies, smart city applications are considered as one of the prominent solution models. These applications enable the more efficient, sustainable, and climate-sensitive management of urban infrastructure while also helping to reduce environmental impacts and enhance the resilience capacity of cities.

Smart cities stand out today as a technology-driven urban management approach that offers digital and data-based solutions to the complex problems faced by city administrations. Within this vision, data is collected, analyzed, and integrated into management processes across numerous domains—from transportation systems and infrastructure services to street and avenue information, as well as addressing and zoning data to participatory applications. This makes it possible to generate faster, more effective, and sustainable solutions for the needs of individuals living in the city. Smart cities also rely on an integrated technology system that brings together public institutions, private sector actors (both small and large-scale enterprises), financial institutions, and citizens in a digital environment. In this context, smart cities facilitate the digital execution of transactions between citizens and the state, thereby saving time and resources (Uçar, Şemşit & Negiz, 2017: 1786).

This transformation is not only a technological advance, but also a structural transformation process that aims to make cities more resilient in terms of energy efficiency, environmental sustainability and climatic resilience. In this context, the concept of ‘smart city’ represents a model in which digital technologies are used in an integrated manner with urban management and innovative approaches to solutions are developed. According to Gül and Atak Çobanoğlu (2017: 1544), a smart city is an urban structure where information technologies are actively utilized in municipal services, technological participation is ensured, and which possesses an environmental and innovative framework, while also being a setting where both individuals and institutions are involved in active learning and adaptation processes.

The smart city concept is not only a technology-driven transformation, but also includes a multi-layered urban governance model that supports sustainable devel-

20 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/the-role-of-smart-city-applications-in-creating-sustainable-and-climate-responsive-cities-in-the-eu/388585](http://www.igi-global.com/chapter/the-role-of-smart-city-applications-in-creating-sustainable-and-climate-responsive-cities-in-the-eu/388585)

## Related Content

---

### The European Union Development Policy and Achieving Sustainable Development Goals (SDGs) of the United Nations

Mukesh Shankar Bharti (2024). *Global Trends in Governance and Policy Paradigms* (pp. 349-366).

[www.irma-international.org/chapter/the-european-union-development-policy-and-achieving-sustainable-development-goals-sdgs-of-the-united-nations/344216](http://www.irma-international.org/chapter/the-european-union-development-policy-and-achieving-sustainable-development-goals-sdgs-of-the-united-nations/344216)

### Accounting Convergence, Mandatory Adoption of IFRS, and Accounting Quality

Sinem Ates (2021). *Handbook of Research on Institutional, Economic, and Social Impacts of Globalization and Liberalization* (pp. 605-627).

[www.irma-international.org/chapter/accounting-convergence-mandatory-adoption-of-ifrs-and-accounting-quality/266052](http://www.irma-international.org/chapter/accounting-convergence-mandatory-adoption-of-ifrs-and-accounting-quality/266052)

### The Development of the Environmental Impact Assessment Process in Botswana

Eagilwe M. Segosebe (2020). *Developing Eco-Cities Through Policy, Planning, and Innovation: Can It Really Work?* (pp. 48-61).

[www.irma-international.org/chapter/the-development-of-the-environmental-impact-assessment-process-in-botswana/236488](http://www.irma-international.org/chapter/the-development-of-the-environmental-impact-assessment-process-in-botswana/236488)

### Aligning Green Finance With Climate Governance: Strategies for Mitigating Global Warming

Ananya Pandey (2026). *Designing Effective Public Policies to Address Global Warming* (pp. 157-184).

[www.irma-international.org/chapter/aligning-green-finance-with-climate-governance/388577](http://www.irma-international.org/chapter/aligning-green-finance-with-climate-governance/388577)

France's Role Within NATO: Realism Through New Relations With Russia –  
Franco-Russian Relations: A Significant Element

Karim Belgacem (2021). *NATO and the Future of European and Asian Security* (pp. 44-53).

[www.irma-international.org/chapter/frances-role-within-nato/286717](http://www.irma-international.org/chapter/frances-role-within-nato/286717)