

# Chapter 9

## The Green City: Sustainable and Smart Urban Living Through Artificial Intelligence

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### ABSTRACT

*The increasing global awareness of the need for sustainable urbanization is driving the integration of green artificial intelligence (Green AI) in urban planning and management. AI applications include intelligent automation in energy management, intelligent transport systems, improved infrastructure strength and durability, and enhanced individual safety and security through AI surveillance and predictive policing systems. Case studies from Amsterdam, Singapore, and New York demonstrate how AI solutions are changing productivity, energy consumption, emissions, safety, and the environment. AI also improves infrastructure construction, traffic congestion, and public safety by evaluating sensor data and notifying undesired events. Big cities like London and New York are implementing AI in their public safety initiatives. AI applications are essential for enhancing resilience, energy efficiency, public safety, and environmental monitoring, as well as green urban planning and management.*

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## INTRODUCTION

Green cities, also called sustainable or eco-friendly cities, embody a transformative approach to urban development that aims to achieve a harmonious balance between environmental sustainability, economic viability, and social equity. These cities are carefully planned to reduce their environmental impact through resource efficiency, encouragement of renewable energy use, and waste and pollution mitigation techniques. The concept covers a wide range of activities, from developing sustainable transportation systems and environmentally friendly building construction to implementing cutting-edge waste management strategies and water conservation measures.

Modern technologies like artificial intelligence (AI) and the Internet of Things (IoT) enable these initiatives. Several environmental, social, and technological shifts throughout history have impacted the development of green cities. Ancient towns like those in Mesopotamia and the Indus Valley were built from natural resources and frequently blended in well with their surroundings during the early stages of urbanization. One example of an early attempt to incorporate green spaces into urban living is the Hanging Gardens of Babylon. But in the 18th and 19th centuries, the Industrial Revolution brought about a dramatic change in priorities (Artmann et al., 2019). Economic growth and industrial efficiency became more important as a result of rapid industrialization and urbanization, frequently at the expense of environmental sustainability. As a result, there was extreme pollution, resource depletion, and overcrowding.

Cities developed as centres of economic activity, but in the process, they frequently jeopardized public health, clean water, and air. Because of the detrimental effects of industrialization, environmental consciousness increased dramatically in the 20th century. Significant events such as the 1962 publication of Rachel Carson's "Silent Spring" brought attention to the damaging impact that industrial activity and pesticides have on the environment. This period also saw the founding of Earth Day in 1970, which increased public awareness and prompted the creation of environmental conservation organizations all around the world. The growing environmental movement emphasized how crucial sustainable policies and practices are to protecting the environment and improving public health (Loughran et al., 2020).

The 1987 Brundtland Report, "Our Common Future," popularized the idea of sustainable development by introducing the idea of addressing present demands without sacrificing the ability of future generations to address their own. The importance of finding a balance between social justice, environmental preservation, and economic progress was stressed in this paper. The approval of Agenda 21, a comprehensive plan to advance sustainable development globally, during the 1992 Rio de Janeiro Earth Summit further cemented international commitment to sustain-

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