Chapter 5
Privacy and Security Concerns With 6G Smart City Infrastructure

Yogeshwar Prajapati
https://orcid.org/0009-0007-3335-3151
Marwadi University, India

Krupali Gosai
Marwadi University, India

Omprakash Suthar
https://orcid.org/0000-0002-7840-481X
Marwadi University, India

Sushil Kumar Singh
Marwadi Univeristy, India

Muhammad Talha Usman
https://orcid.org/0009-0001-9934-7818
UET Taxila, Pakistan

Habib Khan
Gachon University, South Korea

ABSTRACT

6G technology in smart cities brings a new era of connection, efficiency, and innovation, but it also raises privacy and security concerns. This chapter discusses smart city components such IoT devices, autonomous systems, and smart grids. It introduces 6G networks' ultra-low latency, massive device connections, and high data rates. This chapter discusses cyber-physical attacks, data breaches, network intrusions, and other privacy and security issues particular to 6G-enabled smart cities. Smart city environments generate a lot of data, thus data ownership, permission, and anonymization are carefully examined. This chapter discusses 6G-appropriate security and privacy tactics such enhanced encryption, secure communication protocols, and AI-driven threat detection systems. In conclusion, this chapter discusses privacy and security in 6G-enabled smart cities, including where the field is going and what the future holds for research, to help create trustworthy, resilient, and secure smart city ecosystems that can take advantage of 6G's revolutionary capabilities.

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1. INTRODUCTION

The emergence of 6G technology has the potential to fundamentally transform smart cities by providing significant improvements in speed, connectivity, and data processing efficiency. 6G, operating in the terahertz frequency band, offers data rates that are up to 100 times faster than 5G and latency that is reduced to microseconds. This allows for real-time communication and the running of complex applications across urban infrastructures. This advanced technology seamlessly integrates artificial intelligence to maximize the automation and efficiency of urban services, while also enabling the Internet of Everything (IoE) to establish a more interconnected and responsive urban environment. Even so, the implementation of 6G raises significant security and privacy concerns, since the increase in connectivity and data transmission exposes new vulnerabilities that need to be resolved to protect smart cities.

1.1 Overview of 6G Technology

The upcoming 6G technology, considered the next advancement in wireless communication, will help to transform smart cities by providing exceptional speed, connectivity, and intelligence. Estimated to function within the terahertz frequency spectrum, 6G is predicted to provide data transmission rates that are up to 100 times faster compared to that of 5G, accompanied by a reduction in latency to microseconds. Real-time communication and processing across the extensive networks of devices and sensors that support smart city infrastructures will be made possible by this performance enhancement. Below figure 6.1 illustrates the overview of 6G Technology.

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