

# Chapter 10

## Impact of 5G Security on Smart Cities' Internet of Things Implementation

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### ABSTRACT

*Smart cities are imperative in terms of smart buildings, transportation, parking, healthcare, agriculture, traffic systems, and public safety aided by the fifth generation (5G) computation standards. They are entirely capable of controlling real-time devices and delivering relevant smart information to the citizens. However, different architectural stages experience privacy and security concerns. Therefore, in this survey, an internet of things (IoT) based architecture is proposed, showing the critical layers that are key to ensure secure smart IoT implementation. The study further covers the recent approaches to security applications for information centric SCs. 5G security solutions have been highlighted in SCs' settings and proposed. Comparably, a comprehensive SC current 5G security and numerous open security concerns are demonstrated. Lastly, offer potential research directions and motivations mainly in academia and industry, outlining these concerns that need to be considered to enhance smart daily operations.*

### INTRODUCTION

The United Nations report demonstrated that over half of the global population resides in urban centers and cities, therefore making the urban population grow faster than in the past few decades (Cui et al., 2018). As a result of its stringent standards and feasible urbanized environment, the definition of “smart city” (SC) has attracted the interest of industry and academia (Jain et al., 2022). Different smart strategies and infrastructures have been adopted by several SCs across the globe to enhance people's standards

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of living and services. Some notable countries with large populations are investing money in initiatives connected to SCs. China is reported to be engaged in more than 200 projects that support the concept of SCs. Urban municipals are managing their daily operations to increase the quality of life for people due to technologies related to SCs (Xu et al., 2022). Smart, healthcare, transit, and traffic systems are a few examples of the myriad gadgets and interconnected systems that make up the infrastructure of SCs.

The 5G (fifth-generation) security and integration in SC operates using the Internet of Things (IoT), where physical devices are evolving into smart devices in daily life. This has increased because of the combination of numerous low-cost devices, for instance, actuators and sensors, and the quick advancement of wireless communication tech. Information-centric networking (ICN) solutions can be used to advance the rise of IoT and its implementation. In addition, internet protocol (IP)-based strategies like the one described instead of relying on Internet Protocol (IP) host identification address, ICNs are defined as a strategy that places information at the core of the design (Yang et al., 2021). ICNs can serve numerous 5G IoT circumstances and get based on their existing constraints. In the IoT context, it can be applied as a framework to connect multiple sensor-equipped items and provide a range of services, as demonstrated in Figure 1. In the IoT era, using ICN can also reduce energy consumption.

Cities are growing smarter, which might put people at serious risk for security and privacy at all operation levels. Resource-constrained devices make the SC susceptible to many types of 5G security threats. These weaknesses could make SCs vulnerable to several cyberattacks. For instance, malevolent

*Figure 1. Smart city situation using internet of things submission (smart healthcare, smart transportation, smart building, and other IoT devices), as adopted by Jun et al., 2021*



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