

## Energy Management System of Luminosity Controlled Smart City Using IoT

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### Abstract

**INTRODUCTION:** With the escalating rates of urbanization, there is a pressing need for enhanced urban services. The concept of smart cities, leveraging digital technologies, offers a promising solution to elevate urban living. The integration of Internet-of-Things (IoT) in urban infrastructure, particularly on highways, opens avenues for novel services and cross-domain applications through Information and Communication Technologies. However, the efficient functioning of an IoT-enabled smart city necessitates careful energy resource management.

**OBJECTIVES:** Propose a Highway Lighting System (HWLS) integrating IoT technologies to enhance urban services, focusing on significant energy savings and real-time environmental parameter monitoring.

**METHODS:** To achieve the objective of enhancing urban services through the proposed Highway Lighting System (HWLS), the system was designed and implemented by integrating cutting-edge sensors, communication links, and the Blynk IoT app. The deployment involved incorporating IoT technologies for real-time monitoring of air quality, air moisture, and soil moisture, alongside a fault identification system using GSM and GPS modules.

**RESULTS:** The proposed HWLS demonstrates significant energy savings, consuming only 37.6% of the original power consumption. The incorporation of IoT technologies facilitates real-time monitoring of environmental parameters, enabling informed decision-making for urban service optimization. The fault-finding system, utilizing GSM and GPS modules, enhances the reliability of the lighting system.

**CONCLUSION:** In conclusion, the Highway Lighting System (HWLS) represents a novel approach to smart city infrastructure, particularly in the context of urban lighting. The integration of IoT technologies not only contributes to energy savings but also enhances the overall efficiency of urban services. The proposed system's ability to monitor environmental parameters and identify faults demonstrates its potential for sustainable urban development and improved quality of life.

**Keywords:** Internet-of-Things, Highway Lighting System, GSM, GPS

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### 1. Introduction

The 21st century has seen the internet become a need for human existence. Many ideas for distant human-to-human

and human-to-machine communication have been developed as a result of the internet's evolution. The next stage is to link systems and devices to provide machine-to-machine communication. The emergence of IoT has revolutionized the way systems and individuals are interconnected through











