A Survey on IoT-Based Systems for Vehicular Emission Monitoring and Air Quality Management

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Abstract: *With the continuous rise in the number of vehicles worldwide, vehicular emissions have become one of the major contributors to urban air pollution, posing severe environmental and health hazards. Traditional pollution monitoring methods are often limited by their fixed locations, high costs, and inability to provide real-time data. In recent years, the Internet of Things (IoT) has emerged as a promising solution for real-time vehicle emission monitoring, enabling continuous data collection, remote monitoring, and timely alerts. This review paper presents a comprehensive analysis of existing IoT-based vehicle pollution monitoring systems, including their architectures, sensor technologies, communication protocols, cloud platforms, and data visualization methods. The paper also discusses the challenges, limitations, and future research directions to enhance the efficiency, scalability, and accuracy of these systems for effective air quality management and smart city implementation.*

Keywords: IoT, Vehicle Emission Monitoring, Air Pollution, Real-Time Monitoring, Smart City