ABSTRACT

With the increase in the urbanization the population is increasing and the number of vehicles are also increasing rapidly which result in increase in congestion and accident on the road so, using Internet of Things (IoT) technologies, this study presents an enhanced road and traffic safety management system. Through the integration of state-of-the-art innovations, the system seeks to change traditional traffic management tactics. Using a rescheduling algorithm for traffic signals is one such innovation that improves the effectiveness and responsiveness of traffic flow control. By utilizing IoT-enabled solutions to optimize street light functioning, the system also tackles the crucial problem of power consumption.

Based on current traffic circumstances, the suggested traffic signal rescheduling technique is intended to dynamically modify signal timings. The algorithm makes use of information gathered from a variety of IoT sensors spread throughout road networks to optimize signal phases and timings in order to reduce traffic jams, decrease delays, and improve traffic flow in general. Compared to conventional fixed-time signal systems, this dynamic method to traffic signal control delivers considerable gains by quickly adjusting to changing traffic patterns and reducing congestion hotspots.

Smart street light monitoring and control to maximize energy efficiency is also made possible by the incorporation of IoT technologies. Through the use of sensors to measure ambient light levels and traffic density, the system automatically modifies the brightness and timing of street lights to provide sufficient illumination while reducing wasteful energy consumption. This proactive method lowers carbon emissions linked to street lighting, which benefits the environment by reducing operational expenses as well.

Moreover, the gathered information is transferred to the cloud, which makes it easier to create graphical displays on a schedule. These graphs offer insightful information for additional research and decision-making procedures. Through the visualization of traffic patterns, hotspots for congestion, and trends in energy use, stakeholders can make well-informed decisions aimed at enhancing urban mobility, optimizing resource utilization, and improving safety. The system's scalability and accessibility are improved by the cloud-based data analysis, which also makes it easier to integrate the system with the current smart city infrastructure and promote cooperative efforts towards sustainable urban development.