Real-Time Tracking System for City Bus Location And Passenger Count

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Abstract*: This survey paper reviews the advancements in real-time tracking and passenger counting systems for city buses, emphasizing the growing need for efficient, data-driven public transit solutions. As urban populations rise, city transport systems face challenges in managing demand, reducing congestion, and improving service reliability. Real-time tracking systems using GPS, GIS, and IoT-enabled sensors enable passengers and transit authorities to monitor bus locations and optimize travel times. Additionally, passenger counting systems—utilizing infrared, AI-based vision models, and pressure sensors—provide data on bus occupancy levels, allowing commuters to make informed travel decisions and helping transit agencies manage resources efficiently.*

This paper examines existing technologies, compares various tracking and counting methods based on accuracy, cost, and scalability, and explores recent trends in artificial intelligence, big data analytics, and smart city integration. Furthermore, it identifies critical challenges, including data privacy, accuracy in urban environments, and energy consumption, proposing future research directions for enhancing the reliability, sustainability, and user-friendliness of these systems. Our findings underscore the transformative potential of real-time bus tracking and passenger counting in advancing public transportation infrastructure and enhancing urban mobility.

Keywords: real-time tracking