

REIMAGINING URBAN SPACES

PRESENTED BY– URBAN INNOVATORS (SAV148)

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ABSTRACT

Problem Statement: In rapidly urbanizing unplanned cities, managing critical infrastructure like traffic and sewage systems poses significant challenges. Growing populations lead to severe congestion and pollution, impacting public health, while outdated sewage systems face blockages and overflows. Data-driven solutions are essential for enhancing urban efficiency and sustainability in these vulnerable areas.

Our project leverages data science and machine learning to tackle two major urban issues—traffic congestion and sewage management—by providing predictive insights and optimization solutions. This integrated approach enables cities to become more efficient, sustainable, and resilient.

The first model, the Traffic Diversion System, predicts congestion by analyzing historical traffic patterns and real-time data. By suggesting alternative routes and diverting vehicles, the model minimizes congestion, enhances urban mobility, and reduces travel time by up to 30%, along with significant reductions in fuel consumption and emissions, resulting in improved air quality and a better quality of life for urban residents.

The second model focuses on Sewage Management by predicting when storage facilities will reach capacity, allowing authorities to schedule waste removal during low-traffic periods. It optimizes the placement of mini underground pumping stations to prevent blockages and ensure smooth flow across the network. This approach aims to reduce maintenance costs by 25% and mitigate public health risks.

By integrating machine learning and data analytics, our solution offers proactive infrastructure management, driving urban efficiency, sustainability, and resilience. These models are scalable and adaptable, applicable globally to contribute to smarter, more livable cities while empowering them to address pressing urban challenges.

Future Scope: The project envisions enhancements for urban infrastructure. A Metro Ambulance Service could use metro trains equipped with medical compartments for the rapid transport of accident victims, ensuring timely medical care and expedited hospital transfers. In sewage management, IoT-enabled units can treat waste at the source, significantly reducing blockages and minimizing transportation needs, leading to a more efficient system.

Wow Factor: Imagine a city where traffic congestion is a relic of the past, and sewage is treated on-site with eco-friendly technologies. This innovative infrastructure not only creates a congestion-free society but also enhances daily life for everyone, fostering a sustainable, resilient future for all.

Keywords: Traffic diversion, Sewage management, Urban mobility, Predictive infrastructure, Smart city solutions.