7. TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning

Problem Statement:

Urban traffic congestion is a growing challenge, impacting commute times, fuel consumption, and city planning efficiency. Traditional traffic monitoring methods often rely on expensive sensors or manual observation. TrafficTelligence aims to revolutionize traffic volume estimation by leveraging machine learning to analyze real-time video feeds and aerial imagery. This intelligent system can automatically detect, track, and quantify vehicle flow on highways and city roads, offering scalable, cost-effective, and data-driven insights for smart city infrastructure.

Technology Stack:

TPython,OpenCV,Deep Learning (CNNs, YOLOv8/YOLOv5),TensorFlow or PyTorch,Aerial/Surveillance Video Datasets Pandas, NumPy, Matplotlib for data handling and visualization

Use Cases:

- Real-time traffic congestion analysis for smart city management
- Optimizing traffic signal timings using predicted traffic volume
- Infrastructure planning based on long-term traffic pattern insights