**Class Notes: ITAI 2372 – AI Revolution: Smart Cities and Transportation**

**Lecture delivered by: Professor Anna Devarakonda**

**Date: 13th February, 2025**

**Topic:** **AI Revolution: Smart Cities and Transportation**

**Smart Cities -** A smart city is a city that uses digital technology to improve the lives of its residents. Smart cities use data and technology to make cities more efficient, sustainable, and livable.

1. **Smart/Intelligent Traffic Management:**

* Real-time traffic monitoring: AI-driven systems utilize IoT sensors, HD cameras, and vehicle tracking for real-time monitoring, congestion prevention, and automated incident response.
* Adaptive traffic signals: optimizes traffic flow through AI signal timing, interaction and routing, and dynamic speed management.

1. **Efficient Energy Management:**

* Smart grids: Dynamically allocating electricity across the network, optimizing the integration of renewable energy sources like solar and wind, and mitigating power outages.
* Energy-efficient buildings/homes: Analyze energy consumption patterns in individual buildings to identify areas for improvement and suggest adjustments to heating, cooling, and lighting systems.

1. **Public Safety:**

* To anticipate, monitor, and investigate crimes.
* Predictive policing: By analyzing patterns in historical data, AI can predict high-crime areas or potential incidents, enabling proactive deployment of police resources, especially when important events occur in those areas.

1. **Waste Management:**

* Smart bins: Using IoT to monitor fill levels and send alerts for timely collection, reducing overflow and optimizing routes. Also for sorting wastes into wet or dry.
* Recycle tracking systems: Using AI and QR code tagging to track recyclable materials through the collection and processing cycle, improving recycling rates.

A typical example is California's recycling program which resulted in fraud. California’s Recycling Program and Fraud Cases: California has one of the largest recycling programs, offering deposit refunds for bottles and cans. However, the system has faced issues with fraudulent claims, including out-of-state recycling imports and false redemption reporting. AI-powered solutions, such as blockchain tracking and automated audits, are being explored to combat these issues, ensuring accountability and system integrity.