PHASE -3 DEVELOPMENT

OBJECTIVE:

Implement an integrated traffic management system to optimize urban mobility, enhance safety, and reduce congestion. Employ advanced technologies for real-time data analysis, adaptive signal control, and predictive modeling. Enhance public awareness through community engagement initiatives and education programs. Foster sustainable practices by promoting alternative transportation options and prioritizing eco-friendly infrastructure development. Ensure seamless coordination between stakeholders for efficient and inclusive transportation solutions.

IMPLEMENTATION:

To Develop an AI-based system for real-time traffic monitoring, analyzing data, and optimizing signals to ensure smooth traffic flow.The following components are required:

COMPONENTS:

1. Traffic Monitoring System:

Cameras, sensors, and software for real-time data collection and analysis.

2. Intelligent Signage:

LED displays, controllers, and software for dynamic traffic guidance and information dissemination.

3. Smart Intersection Control:

Traffic lights, controllers, and algorithms for optimized traffic flow and safety.

4. Data Analysis and Prediction:

Big data infrastructure, analytics tools, and algorithms for traffic pattern forecasting.

5. Communication Infrastructure:

Network devices, servers, and protocols for seamless data transmission and system coordination.

STEPS:

1. Research and Analysis:
Gather traffic data, conduct surveys, and analyze trends to identify problem areas.
2. Planning:
Develop comprehensive strategies, considering road infrastructure, signal optimization, and public transportation integration.
3. Implementation:
Execute planned solutions, including lane markings, signage, and traffic light adjustments.
4. Monitoring and Evaluation:
Regularly assess the effectiveness of implemented measures through traffic flow analysis and public feedback.

5. Adaptation and Improvement:
Adjust strategies based on evaluations, considering technological advancements and community needs for sustained traffic management efficiency.

CODE:

```
import time
import random

# Define a basic Traffic Light class
class TrafficLight:
    def __init__(self):
        self.state = "red"
    def change_light(self):
        if self.state == "red":
            self.state = "green"
        else:
            self.state = "red"


# Define a basic Car class


class Car:


    def __init__(self, name, speed):


        self.name = name


        self.speed = speed


    def __str__(self):


        return f"{self.name} ({self.speed} mph)"


# Simulate traffic management system


def traffic_simulation():


    traffic_light = TrafficLight()


    cars = [Car("Car 1", 60), Car("Car 2", 70), Car("Car 3", 50)]
```

```
    for i in range(10):  # Simulate for 10 time
steps        print(f"Time Step {i+1}:")

        for car in cars:

            print(f"{car.name} is moving at {car.speed} mph.")

            time.sleep(0.5)  # Simulate time passage

    print(f"Traffic Light is {traffic_light.state}")

        time.sleep(0.5)  # Simulate time passage

        traffic_light.change_light()

# Run the simulation

traffic_simulation()
```