smart city network that involves tracking transportation, traffic signals, roads, sensors, vehicles, and maintenance// Create Roads

CREATE (r1:Road {name: 'Main Street', length\_km: 5, traffic\_density: 'High'})

CREATE (r2:Road {name: 'Park Avenue', length\_km: 3, traffic\_density: 'Low'})

CREATE (r3:Road {name: 'Broadway', length\_km: 7, traffic\_density: 'Medium'})

// Create Traffic Signals

CREATE (s1:TrafficSignal {location: 'Main Street & 5th Avenue', signal\_type: 'Pedestrian Crossing'})

CREATE (s2:TrafficSignal {location: 'Park Avenue & Elm Street', signal\_type: 'Traffic Light'})

CREATE (s3:TrafficSignal {location: 'Broadway & 8th Avenue', signal\_type: 'Traffic Light'})

// Link Roads to Traffic Signals

CREATE (r1)-[:HAS\_SIGNAL]->(s1)

CREATE (r2)-[:HAS\_SIGNAL]->(s2)

CREATE (r3)-[:HAS\_SIGNAL]->(s3)

// Create Sensors

CREATE (sensor1:Sensor {type: 'Speed Detector', location: 'Main Street & 3rd Avenue', status: 'Active'})

CREATE (sensor2:Sensor {type: 'Vehicle Counter', location: 'Broadway & 5th Avenue', status: 'Inactive'})

CREATE (sensor3:Sensor {type: 'Pollution Monitor', location: 'Park Avenue & 7th Avenue', status: 'Active'})

// Link Sensors to Roads

CREATE (r1)-[:MONITORED\_BY]->(sensor1)

CREATE (r2)-[:MONITORED\_BY]->(sensor3)

CREATE (r3)-[:MONITORED\_BY]->(sensor2)

// Create Vehicles

CREATE (v1:Vehicle {plate\_number: 'XYZ123', type: 'Sedan', owner: 'John Doe'})

CREATE (v2:Vehicle {plate\_number: 'ABC456', type: 'Truck', owner: 'Alice Smith'})

CREATE (v3:Vehicle {plate\_number: 'LMN789', type: 'SUV', owner: 'Mark Johnson'})

// Create Vehicle Movements

CREATE (v1)-[:MOVES\_ON]->(r1)

CREATE (v2)-[:MOVES\_ON]->(r2)

CREATE (v3)-[:MOVES\_ON]->(r3)

// Create Maintenance Tasks

CREATE (m1:Maintenance {task: 'Road Repair', status: 'Completed', date: '2025-01-10'})

CREATE (m2:Maintenance {task: 'Signal Upgrade', status: 'In Progress', date: '2025-01-15'})

CREATE (m3:Maintenance {task: 'Sensor Calibration', status: 'Scheduled', date: '2025-02-01'})

// Link Maintenance to Roads, Signals, and Sensors

CREATE (m1)-[:MAINTAINS]->(r1)

CREATE (m2)-[:MAINTAINS]->(s1)

CREATE (m3)-[:MAINTAINS]->(sensor2)

**QUERIES**

1. Query to Find Roads with Active Sensors

MATCH (r:Road)-[:MONITORED\_BY]->(sensor:Sensor)

WHERE sensor.status = 'Active'

RETURN r.name AS Road\_Name, sensor.type AS Sensor\_Type, sensor.location AS Sensor\_Location

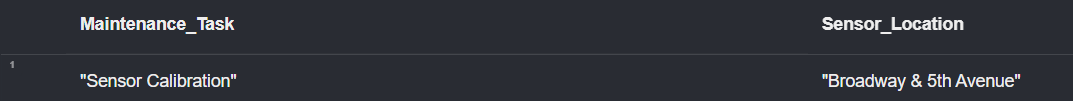
A screenshot of a computer

Description automatically generated

2.Check Sensor Maintenance: Find maintenance tasks for sensors.

MATCH (m:Maintenance)-[:MAINTAINS]->(sensor:Sensor)

RETURN m.task AS Maintenance\_Task, sensor.location AS Sensor\_Location



3.Check Traffic Signal Maintenance

MATCH (m:Maintenance)-[:MAINTAINS]->(s:TrafficSignal)

RETURN m.task AS Maintenance\_Task, s.location AS Signal\_Location

A black rectangular object with a white line

Description automatically generated

4. Check Vehicles Monitored by Active Sensors

MATCH (v:Vehicle)-[:MOVES\_ON]->(r:Road)-[:MONITORED\_BY]->(sensor:Sensor)

WHERE sensor.status = 'Active'

RETURN v.plate\_number AS Vehicle\_Plate, r.name AS Road\_Name, sensor.type AS Sensor\_Type

A screenshot of a computer

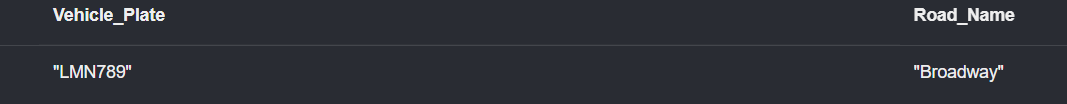
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5.Query to Find Vehicles on Specific Roads

MATCH (v:Vehicle)-[:MOVES\_ON]->(r:Road)

WHERE r.name = 'Broadway'

RETURN v.plate\_number AS Vehicle\_Plate, r.name AS Road\_Name



**GRAPHICAL OUTPUT**

