American International University – Bangladesh

Course Name: Software Development Project Management

Group No: 4   Section: B

Name	Id	Department
MAHMUDUL HASAN	20-43959-2	CSE
MUSFIQUR RAHMAN MUIN	19-41514-3	CSE
RAFIA MAHJABIN ORNI	20-43873-2	CSE
MD JAHID HASAN KHAN	20-43898-2	CSE

Adaptive Traffic Control System

1. Project Title: Adaptive Traffic Control System (ATCS)

2. Objective and Subobjectives:

2.1 Objective:

To develop a software system that optimizes traffic flow in urban areas by dynamically adjusting traffic signal timings based on real-time traffic conditions.

2.2. Subobjectives:

- Collect and analyse real-time traffic data from intersections.
- Develop algorithms to predict traffic patterns and adjust signal timings accordingly.
- Improve traffic flow and reduce congestion.
- Decrease travel times and fuel consumption.
- Enhance pedestrian and cyclist safety.

3. Project Justification:

Traffic congestion is a major problem in urban areas, leading to wasted time, increased fuel consumption, and air pollution. An ATCS can significantly improve traffic flow by dynamically adjusting traffic signals based on real-time data. This will benefit commuters, businesses, and the environment.

4. Project Overview (Description with Use Case Diagram):

The ATCS will consist of three main components:

- **Data Collection:** Sensors embedded in roads will collect data on traffic volume, speed, and vehicle type.

- **Central Processing Unit (CPU):** The CPU will receive real-time data from sensors and use algorithms to predict traffic patterns and determine optimal signal timings.

> **Traffic Signal Controllers:** These will receive instructions from the CPU and dynamically adjust traffic signal timings.

Use Case Diagram:
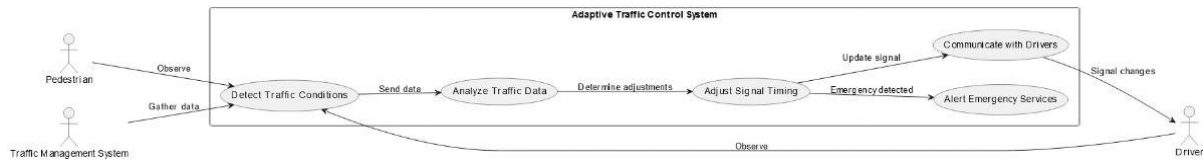
Use Cases:

> Drivers use the road network.

> Pedestrian's (Transportation manager) cross intersections.

> Traffic Management Officials monitor and configure the system.

> Sensors detect traffic data and send it to the CPU.

> CPU analyses data and calculates optimal signal timings.

> Traffic Signal Controllers receive and implement new signal timings.

5. Modules, Scopes

5.1 Modules:

> **Data Acquisition Module:** Collects real-time traffic data from sensors.

> **Data Processing Module:** Processes and analyses traffic data.

> **Traffic Prediction Module:** Uses historical data and machine learning to predict future traffic patterns.

> **Signal Optimization Module:** Calculates optimal traffic signal timings based on predicted traffic patterns.

> **Communication Module:** Transmits signal timing information to traffic signal controllers.

> **User Interface Module:** Provides a user interface for traffic management officials to monitor system performance and configure settings.

5.2 Project Scope:

This project will focus on developing the core functionalities of the ATCS. Integration with existing traffic management infrastructure may require additional development in future phases.

6. Project Stakeholders:

➢ Client Company (Project Sponsor)

➢ ACTS(Project Developer)

➢ Traffic Management Agency

➢ Commuters and Pedestrians

7. Resource Requirements:

➢ Software Developers

➢ Data Scientists

➢ System Integrators

➢ Project Manager

8. Technical Requirements:

➢ Programming Languages (e.g., Python, Java)

➢ Database Management System

➢ Traffic Simulation Software

➢ Machine Learning Libraries

9. Operating System:

Windows Operating System And Linux Operating System.

10. Hardware and Software Requirements:

➢ Hardware specifications will depend on the scale of the deployment.

➢ Standard office software will be required for project management and communication.

➢ **Hardware Specifications**

Processor	Intel Core i7 (9th gen) or equivalent
Storage space	1 TB
Display	LED panel

Memory	8x8 GB

➢ Software Specifications:

Operating system	Windows 7,10 for 32- bit/x86 and 64-bit/x64
Programming language	JAVASCRIPT, C#,CSS
Data Base	Microsoft SQL

11. Pricing:

We will provide a detailed pricing proposal after a thorough analysis of your specific requirements. However, our pricing model typically includes:

- ➢ Initial development cost
- ➢ System integration cost
- ➢ Training cost
- ➢ Warranty period

Hardware Costs:

Traffic signal controllers: $5,000 to $20,000 per intersection, depending on complexity and features.

Sensors (cameras, radar, loops): $1,000 to $10,000 per sensor, depending on type and quality.

Communication devices: $500 to $2,000 per device.

Software Costs:

Software platform: Licensing fees can range from $10,000 to $100,000 or more, depending on the scale and features of the system.

Training cost: Variable based on the number of staff members and training requirements, typically ranging from $500 to $5,000 per person.

Warranty & Limitation of Liability:

We will provide a 2 year warranty on the software. During this period, we will fix any malfunctions or bugs to ensure the software operates according to specifications. We offer ongoing maintenance and support services at an additional cost.

Contact Us:

For any inquiries or to discuss your specific needs, please contact us through the following methods:

➢ Phone: 0170000000

➢ Email: aiub@gmail.com

➢ Website: aiubtrafficbd.com

We look forward to partnering with you to develop an innovative ATCS that will improve traffic flow and make your city a better place to live.