



ADDIS ABABA
**SCIENCE AND
TECHNOLOGY**
UNIVERSITY
UNIVERSITY FOR INDUSTRY

COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING

Fundamental of Programming II

Department of Software Engineering

PROJECT TITLE=TRAFFIC MANAGEMENT
SYSTEM

Group Members Name

ID NO.

- Selahadin DesalegnCEP0097/14
- Bontu Feyisa.....CEP0023/14
- Rachel Chane.....CEP0094/14
- Eleninigist Alebachew.....CEP0035/14
- Aniska Abiyu.....CEP0310/14

September 2023

Contents

<u>Title</u>	<u>Page</u>
1. Traffic Management System.....	3
2. Traffic Management System in Addis Ababa.....	3
3. Traffic in Addis Ababa.....	4
4. Problem Statement.....	5
5. What to be done?.....	6
6. Why We Implement Such a System.....	6

Traffic Management System

A traffic management system is a collection of technologies, strategies, and practices designed to monitor, control, and optimize the flow of traffic on road networks and by that our primary goal is to improve traffic efficiency, reduce congestion, enhance safety, and provide a better overall transportation experience for all drivers and pedestrians.

Traffic management systems typically involve a combination of hardware and software components, including:

- 1. Traffic Monitoring:** Sensors, cameras, and other monitoring devices are used to collect real-time data on traffic conditions.
- 2. Traffic Signal Control:** the timing and sequencing of traffic signals at intersections. These systems can adjust signal timings based on real-time traffic conditions to optimize traffic flow.
- 3. Incident Detection and Management:** detect and respond to incidents such as accidents, breakdowns, or road hazards by using sensors, CCTV cameras, or incident reports from the public to identify and manage the situation effectively.
- 4. Traffic Data Analysis:** to identify traffic patterns, congestion hotspots, and other trends.

Traffic Management System in Addis Ababa

- 1. Traffic Signal Control:** installed at major intersections throughout the city. These signals are programmed and timed to regulate traffic flow, minimize conflicts, and optimize traffic movement. Efforts are made to synchronize traffic signals along key routes to facilitate smoother traffic progression.
- 2. Intelligent Transportation Systems (ITS):** involves the use of advanced technologies, such as traffic cameras, vehicle detection sensors, and data analytics, to monitor traffic conditions in real-time. This data is then utilized to make informed decisions regarding traffic management strategies.
- 3. Traffic Law Enforcement:** responsible for addressing traffic violations, ensuring compliance with traffic rules, and promoting road safety.

4. Public Transportation Development: Addis Ababa has implemented the Rail Transit system, which provides a reliable and efficient mode of transportation. The city has also been expanding the bus network and promoting integrated public transportation systems to encourage people to use public transportation instead of private vehicles.

5. Road Infrastructure Development: The city has been investing in the expansion and improvement of road infrastructure. This includes constructing new roads, bridges, and interchanges to alleviate traffic congestion at key junctions and improve overall traffic flow.

6. Traffic Data Collection and Analysis: gather real-time data on traffic patterns, congestion levels, and travel times.

Traffic in Addis Ababa

Addis Ababa experiences traffic congestion and challenges due to its rapidly growing population and limited road infrastructure. The city has witnessed a rise in the number of vehicles on the road, leading to increased traffic volumes and congestion.

Factors contributing to traffic in Addis Ababa include:

1. Population Growth: The city's population has been rapidly increasing, leading to more vehicles on the roads and increased traffic congestion.

2. Limited Road Infrastructure: The road infrastructure is still developing and faces challenges in accommodating the growing number of vehicles.

3. Lack of Public Transportation: need for further development and expansion to reduce reliance on private vehicles.

4. Driving Culture: Improving driver education and enforcing traffic regulations are ongoing efforts to alleviate traffic issues.

Problem Statement

Emergency Service

There is a need for a road management system that seamlessly integrates with emergency response services, providing a direct communication channel and facilitating quick and coordinated response in case of emergencies.

Pedestrian Movement

Challenges: such as inadequate crosswalks and lack of communication with drivers. There is a pressing need for a pedestrian-focused road management system ensuring the safety of movement.

Road Management

The Road Management System doesn't effectively handle traffic flow and ensures the safety and efficiency of vehicles on the road.

Parking Vehicles

Some to list such as:

- Handling multiple types of vehicles.
- Customer Service.
- Calculating fees for parking.
- Monitoring the parking lot for Parked or Removed cars.

What to be done?

Typically involves a combination of technologies, processes to identify and respond to incidents on the road network and for such thing we implemented a system to manage the traffic flow here's an overview:

- ❖ **A Road Management Service:** traffic flow data, collected from various sources, is analysed to detect congestions and flow of traffic.
- ❖ **Parking Control:** to direct facilitate the parking lot and have info on vehicles if they are removed or parked and check in the spaces for availability.
- ❖ **Emergency Services:** In cases of accidents or medical emergencies, emergency services such as fire, medical personnel and crime investigators are dispatched to provide assistance. Also ensure that Emergency services are promptly alerted, enabling them to reach the scene of the incident on time and provide timely assistance to those in need.
- ❖ **Pedestrian Control:** a system for safety measures during crosswalks and to provide emergency services on time.

Why We Implement Such a Traffic Management System?

- **Fast Traffic Movement:** efficient flow of vehicles on road networks, minimizing congestion and delays. It involves implementing strategies such as optimized traffic signal timing, ensuring smooth and swift movement of vehicles, enhancing overall transportation efficiency.
- **Intelligent Traffic Systems:** It optimizes traffic flow, improve safety, and reduce congestion.
- **Traffic Data Collection and Analysis:** gathering and analyzing information related to traffic patterns, volume, and other relevant parameters.
- **Incident Detection and Management:** identify and manage traffic incidents such as accidents, breakdowns, or road hazards.

- **Parking Management:** implementing strategies to efficiently manage parking spaces. This includes the use of smart parking systems, which provide real-time information on parking availability, guiding drivers to unoccupied spaces and check in for availability or capacity.
- **A Better and Fast Emergency Service:** Aims to improve the response time and effectiveness of emergency services, such as police, fire, and medical department or assistance, in the context of traffic incidents or accidents. This can involve dedicated emergency lanes, real-time communication systems, and coordinated efforts between emergency service providers and traffic management authorities to ensure quick and efficient response, minimizing potential risks and enhancing public safety.
- **For the safety of the people:** All the aforementioned aspects of traffic management and transportation systems ultimately contribute to ensuring the safety of individuals using the road network. By implementing measures like efficient traffic flow, incident detection, and emergency services, the overall safety of commuters and pedestrians is improved.