**6115-mahendra institute of engineering and technology**

**TRAFFIC MANAGEMENT**

**Project Definition**

**and**

**Design Thinking**

**TEAM: PROJ\_223283\_TEAM\_2**

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**DECLARATION:**

We, the students of Computer Science and Engineering,

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TAMIL NADU

that the work entitled " TRAFFIC MANAGEMENT" has been successfully completed under the guidance

of Asst Prof. Ms. ARUNAA A, Computer Science and EngineeringDepartment, Mahendra Institute Of Engineering and Techonology , Namakkal.This dissertation work is submitted in partial fulfillment of the requirements for the award of Degree of Bachelor of Engineering in ComputerScience and Engineering during the academic year 2021-2025.

**ABSTRACTION :**

Traffic management system is a cornerstone of a Smart city.

In the current problems of the world, urban mobility is one of the major problems, especially in metropolitan cities.

Previous traffic management systems are not capable enough to tackle this growth of traffic on the road networks. The purpose of this paper is to propose a smart traffic management system using the Internet of Things and a decentralized approach to optimize traffic on the roads and intelligent algorithms to manage all traffic situations more accurately.

This proposed system is overcoming the flaws of previous traffic management systems. The system takes traffic density as input from cameras which is abstracted from Digital Image Processing technique and sensors data, resultantly giving output as signals management. An algorithm is used to predicts the traffic density for future to minimize the traffic congestion. Besides this, RFIDs are also used to prioritize the emergency vehicles like ambulance, fire brigade etc.

By implementing RFID tags in such vehicles. In the case of emergency situations, such as fire explosion or burning of something, fire and smoke sensors are also deployed on the road to detect such situations. Moreover, a mobile application is connected to a centralized server which intimates to nearby rescue department about fire explosion with the location to take further action. In addition, the native user can ask about future traffic condition at a particular node. The proposed system is validated by constructing a prototype and deploying it in a city of Pakistan. A web application is also there to provide useful information in graphical formats to the higher authorities of the smart city which is fruitful in future road planning.

**INTRODUCTION**

Our intelligent Traffic Expert Solution for road traffic control System offers the ability to acquire real-time traffic information, .Traffic Expert enables operators to perform real-time data analysis on the information gathered. Traffic management measures are aimed at improving the safety and flow of traffic utilizing traffic capacity more effectively.

**Purpose :**

Smart Traffic Management is mainly improvised for looking after the Set off data of a region to manage the Traffic along that area and implement various useful technologies which are been required by various persons like vehicle owners, pedestrians, police officers etc….Mainly the purpose of Smart traffic management system is to give the details which can be used and they can be implemented in their daily life. The problems which have been occurred at their presence can be solved by this Smart Traffic.

**Scope :**

Smart Traffic is a Video Analytics Module and provides Traffic Incident Detection, and real time Traffic Flow Metrics & statistical analysis. Smart Traffic Monitoring can integrate with third party traffic management and smart roadway systems and hosts a feature rich product scope itself. The system can be used for incident detection or for statistical metrics of a roadway.

**Problem Statement :**

Over several decades, traffic congestion has become a serious problem in the major cities. Congestion is particularly associated with motorization and the diffusion of the automobile, which has increased the demand for transportation infrastructure. However, the supply of the transportation infrastructure has often not been able to keep up with the growth of mobility.

Traffic congestion problems consist of incremental delay, vehicle operating costs such as fuel consumption, pollution emissions and stress that result from interference among vehicles in the traffic stream, particularly as traffic volumes approach a road’s capacity. Across cities more people are spending more time sitting in traffic jams than ever beforeTraffic congestion occurs when the demand is greater than the available road capacity. There are many reasons that cause congestion; most of them reduce the capacity of the road at a given point or over a certain length, for example people parking on the roads or increase in the number of vehicles. Traffic congestion also occurs due to traffic signal. At traffic signal when road traffic density is low signal still shows the same traffic time due to which other lane traffic increases which result in traffic congestion.

Sometimes due this problem the ambulance, police vans, fire-fighting vehicle are not reaching at their destination on time.

**Objective :**

Objective of proposed system is to improve efficiency of

existing automatic traffic signaling system. The system will be image processing based adaptive signal controlling. The timing will be calculated each time change automatically depending upon the traffic load.

Proposed system will be functioning based on traditional system along with automated signaling. System will have artificial vision with the help of digital camera mounted on motor for its rotation to face lanes and sense the traffic on the road.

The mission of a traffic signal program is to provide good basic service that satisfies the goals of the agency and regional partners involved in transportation systems management and operations (TSM&O).

**REQUIREMENTS :**

Video image Processing System:

It allows the user to define a limited number of linear detection zones on the roadway in the field-of-view of th video camera.

When a vehicle crosses one of these zones, it is identified by noting changes in the properties of the affected pixels relative to their state in the absence of a vehicle.

It estimates vehicle speed and then measure the time that an identified vehicle needs to traverse a detection zone of known length. the number of vehicles (volume) and speed of each vehicle in order to calculate the time each vehicleneeds to cover a particular

**Route Time and Speed table updating System:**

Timetable and speed table updating system stores all estimated travel times and traffic mean speeds related to each route in previous days.

A new time table and speed table with up dated data will be created every 20 seconds. On the other hand the time interval between two Time tables or speed tables is 20 second, hence in this study t0, t1,...,tk are the times at which time tables and speed tables have been created.

Such tables involve the characteristics of a street network, for example travel time and traffic meanspeed are set to ∞ and 0 respectively for nodes not directly linked to each other (T(i,j,tk)= ∞, S(i,j,tk)= 0 for i ≠ j) .

In additions the estimated travel time and traffic mean speed from one node to itself are equal to 0 and ∞ respectively (T(i,j,tk)=0, S(i,j,tk)= ∞ for i=j).

Therefore, each vehicle driver located at a node can communicate with the route-finding system and ask for the shortest path toward his/her destination. This system will take care of the information provided by the timetable and speed table updating systems and will select the shortest route among all possible routes.

**Travel Time Modeling**:

Travel time modeling is used to estimate the travel time associated with each street segment by taking into account the events that periodically cause traffic congestion (e.g.,going to work at a specific time). Here days are categorized, e.g. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.

**Image Enhancement:**

Travel time modeling is used to estimate thetravel timeassociated with each street segment by taking into accountthe events that periodically cause traffic congestion (e.g.,

going to work at a specific time). Here days are categorized, e.g. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday.

**ADVANTAGES**

1. Priority based traffic clearance.

2. Ambulance detection using Image processing

3. Safety message display on LCD

4. Red Signal break (Number plate detection)

5. If any obstacle in any particular lane then display ALERT message on LCD.

**FUTURE SCOPE** :

This project can be enhanced in such a way as to control automatically the signals depending on the traffic density on the roads using sensors like IR detector/receiver module extended with automatic turn off when no vehicles are running on any side of the road which helps in power consumption saving.

No. of passing vehicle in the fixed time slot on the road decide the density range of traffics and on the basis of vehicle count microcontroller decide the traffic light delays for next recording interval. In future this system can be used to inform people about different places traffic condition. This can be done through RADIO.

**CONCLUSIONS :**

In this study two different models have been developed based on different decision criteria:

∙ Finding the shortest path based on the real time data collected from the street network.

∙ Finding the shortest path using travel time modeling method based on historical and real time data that incorporates both concepts of short-term travel time forecasting and shortest path finding. Therefore, this research effort opens many interesting and practical issues for future work.