Project Synopsis

on

**Traffic Management System**

**(Easy Traffic)**

Submitted as a part of course curriculum for

**Bachelor of Technology**

in

**Computer Science**



**Submitted by**

Aakriti Singh 1900290120002

Aditi Dubey 1900290120007

Anurag Shukla 1900290120020

**Under the Supervision of**

Mr. Abhishek Goyal

**KIET Group of Institutions, Ghaziabad**

**Department of Computer Science**

**Dr. A.P.J. Abdul Kalam Technical University**

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**DECLARATION**

We hereby declare that this submission is our work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

Signature of Students

Name:

1. Aakriti Singh (1900290120002)
2. Aditi Dubey (1900290120007)
3. Anurag Shukla (1900290120020)

Date:

**CERTIFICATE**

This is to certify that Project Report entitled “**Traffic Management System (Easy Traffic)**” which is submitted by Aakriti Singh (1900290120002), Aditi Dubey (1900290120007), Anurag Shukla (1900290120020) in partial fulfilment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

**Date: Supervisor Signature**

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Last but not the least, we acknowledge our friends for their contribution to the completion of the project.

Signature:

Date:

Name:

1. Aakriti Singh(1900290120002)
2. Aditi Dubey(1900290120007)
3. Anurag Shukla(1900290120020)

**ABSTRACT**

Cities and traffic have developed hand-in-hand since the earliest large human settlements. The Same forces that draw inhabitants to congregate in large urban areas also lead to sometimes intolerable levels of traffic congestion on urban streets.

The transportation system provides a way for movement and a medium for reaching destinations. An inadequate transportation system hampers economic activities and creates hindrances to development.

Traffic congestion has been one of the fundamental problems faced by modern cities since the wide usage of automobiles. Just a normal few minutes trip to the convenience store may take up to half an hour due to traffic jam or slowdown. Traffic congestions are actually the causes of some issues like road rage, road bullies and major accidents. The small road capacity is also one of the contributing factors.

As the number of private cars increases greatly over the years, traffic congestion occurs when the needed road capacity is not fulfilled.

Simple improvements of the road infrastructure can easily solve this problem.

Since congestion occurs frequently in the cities, local government municipal can consider passing laws on restricting the number of cars owned in a family. This method is in fact, workable and effective.

To provide convenience to the traffic control system and commuters, we will be developing an app that will enable users to register their complaints so that help can reach them as soon as possible.

**INTRODUCTION**

Traffic jam is the situation when vehicles are stopped completely for some time period on the roads. Also, vehicles must wait for a long time to move out of the jam. Sometimes it becomes like congestion in traffic. This happens in transport network due to the increasing vehicles and overuse of roads. Often it is due to slow speed, longer trip time and increased queues of vehicles. Therefore, traffic jam is becoming a major issue mostly in all cities.

Some major problems that arise due to high traffic:

* Traffic is one of the major problems in cities and has made the lives of people difficult. Obviously, it results in non-productive activity.
* People experience delays for their important work. This may even result in personal as well as professional losses.
* It is also the main cause of wastage of fuels and air pollution.
* It increases stress and frustration among motorists and passengers.
* Unsafe driving is the main impact of traffic jam which may lead to road mishaps and hence injuries.
* Traffic jams can also have a negative impact on the mind of a person. The traffic congestion and constant blowing of horns create excessive noise pollution.

Hence, this project aims to help the commuters who are stuck in traffic jams to **report their complaints**so that traffic police can reach the exact location and diverges it as soon as possible. The commuters will be able to share their accurate location rather than texting (through SMS or WhatsApp).

**PROBLEM STATEMENT**

Traffic congestion has been one of the fundamental problems faced by modern cities since the wide usage of automobiles.

The average Mumbai resident wastes the equivalent of 8 days and 17 hours a year stuck in traffic jams. The average Delhi resident spends 7 days and 22 hours, according to TomTom’s 2019 report.

Over the past four years, Mumbai, Delhi and Bengaluru have consistently featured on TomTom’s top 10 most congested cities in the world for traffic.

Just a normal few minutes trip to the convenience store may take up to half an hour due to traffic jam or slowdown.

According to the police, congestions are actually the causes of some issues like road rage, road bullies and major accidents. The small road capacity is also one of the contributing factors.

As the number of private cars increases greatly over the years, traffic congestion occurs when the needed road capacity is not fulfilled.

Since congestion occurs frequently in the cities, local government municipal can consider passing laws on restricting the number of cars owned in a family. Since passing legislations is a lengthy process, we must look for the possible solutions for the problem in hand that is how does a commuter report about the traffic jam s/he stuck in to the concerned authority.

**RESEARCH OBJECTIVE**

1. To study the impact of traffic jam and congestion on the road.
2. To build an android application to allow the users to register their complaint of traffic jam on the road.
3. To develop a web application that monitors the complaint registered, for the administration purpose.
4. To analyze the impact of pollution caused due to traffic congestion.

**LITERATURE REVIEW**

**Elsagheer Mohamed, S. and AlShalfan, K., 2021. Intelligent Traffic Management System Based on the Internet of Vehicles (IoV). *Journal of Advanced Transportation*, 2021, pp.1-23.**

In this paper, they have provided an analytical study of all the services that can be provided by the proposed Intelligent Traffic Management System (ITMS). )e proposed ITMS employs the existing IoV and VANET infrastructure to provide an efficient and intelligent traffic management system without incurring any further complexity of extra components or hardware or any special deployment. In addition, we provided the Smart Traffic Signal architecture and its operation that are suitable for the requirements of Smart Cities. Furthermore, we presented an adaptive algorithm to provide efficient and near-to-theoptimal traffic management for local intersections supporting any number of phases and fully parameterized. Moreover, we presented a simulator that we have developed that simulates the proposed algorithm to study its effectiveness compared to the fixed-time algorithm under different traffic conditions and in different scenarios. We have studied the effectiveness of our proposed system in different traffic scenarios including varied traffic conditions on each segment of the intersection, the minimum and maximum open time (virtual green time), the maximum close time (red time) which is used to prevent starvation, the number of roads, and the service time. Obtained results showed that our ITMS effectively outperforms the traditional traffic management systems with a considerable improvement in terms of the average waiting time and the number of serviced vehicles. Future work directions may include extending the proposed algorithm for global traffic management, including the optimization of all the intersections in Smart Cities. Furthermore, handling the pedestrian in the intersection using Vehicle-to-Pedestrian (V2P) communication and the wearables is one of the possible important future works. )is may include the development of an extra communication model, namely, Pedestrian-to-Infrastructure (P2I). Another work direction is to use Deep Learning and AI in the optimization process for the traffic management process using the current location, destination, and speed of each vehicle to provide better and efficient traffic management.

**Engr. Chijioke C.C. And Ugwuanyi S.E, Towards Efficient And Effective Traffic Management System, Journal of Architecture and Civil Engineering Volume 2 ~ Issue 4 pp: 01-06, 2014.**

The transportation of goods between location to end up in a store or at end-user, these are part of mobility of our society. Each day, millions of people travel to and from work, shops, sports family or clubs. A bottle neck develops when too many people or goods wants to use the same infrastructure at the same time. After all, each infrastructure has a maximum capacity. A place like Abakpa Nike road where there is slow traffic moves can be solved with infrastructural extensions and adjustments However, the significance of alternative ways to sole bottlenecks increase since it requires large investments and also takes time and one of those alternative is traffic management.

The improvement of the available infrastructure is an important way to meet the mobility growth on a network that has limits to its increase in size. The implementation and the provision of proper information of traffic management measures, the number of traffic can be spread in a better way over time, available capacity and modalities. The best result can be achieved by combining approach to traffic issues.

The local levels have this road network of decentralized road authorities (like municipalities and provinces) which their traffic management measure are in place equipped for traffic management. They are mainly related to traffic light. Also on increasing number of advice and information system like route and parking guidance system are being used because DTV consultants is a research and expert firms that mostly works for municipalities and provinces. We have an objective and broad view to the impossibilities and possibilities, also much experience of traffic management in the field.

**Janak Trivedi, Dr. Mandalapu Sarada Devi, Dave Dhara K., 2017. Review Paper on Intelligent Traffic Control system using Computer Vision for Smart City International Journal of Scientific & Engineering Research Volume 8, Issue 6, 2017.**

In this paper, based on different research paper read in the context of transportation management service, explain different algorithms already used, different project and systems working related to TMS, smart-phone involvement regarding improvement in traffic monitoring as well as tracking and in other applications also. Most of the work explained or designed in a foreign country for smart city and what’s actually required as per our Indian government, they are trying to develop smart city concept step by step. So for that initiative from the smart city different parameter better implementation TMS is required. So now from these review papers, our aspects of future work –on transportation management service for INDIAN smart cities and give some solution regarding problem related to traffic management already discussed in section II C.

**Dipak Gade,*International Journal of Recent Technology and Engineering*, 2019. ICT based Smart Traffic Management System “iSMART” for Smart Cities. 8(3), pp.3920-3928.**

This system is prototyped to showcase how effectively existing IT infrastructure of Smart City can be leveraged to design, build, operate and maintain a cost effective but powerful Intelligent Traffic Management System. This Server also communicates with Central Database which is responsible for secure storage of traffic relevant data with time stamp. The iSMART Proof of Concept (POC) is designed keeping in mind some of the most essential features of Smart Traffic Management Systems used for Traffic Control and Management in Smart Cities. COTS Items including the Vision Sensors, Freeware Software and development tools and High-end desktop machine operating with Windows are mostly used to implement the POC. This App is a handy tool for drivers and passengers for an easy interface with iSMART System. The POC was discussed and concept was demonstrated in front of some users for quick feedback. Users appreciated theonceptt considering the short time for overall development and use of free license Software tools and low-cost hardware items to build up the overall solution. Updates of real time traffic using V2V Network: Use of Public Address System may not be an effective communication mechanism for large and distributed group of stakeholders (Drivers, traffic Controllers, Vehicle Passengers, operation and maintenance staff etc.) · Route Optimization: Apart from recommendations on best optimized route based on real time traffic data, it is also good to provide the additional information considering past historical data such as ü Typical Traffic Scenarios for the specified journey date and time, in past ü Possibility of traffic jams ü Typical time to reach to destination with specified vehicle type and load carrying by the vehicle ü Toll gates on the specified route and possible toll charges to be paid ü Nearby available parking lots for the destination · iSMART App should be made available with other mobile operating systems as well specifically for IOS Phone. Are available and can be visible to authenticated users for better planning of their long journey trips in advance. · Apart from Vehicle passengers, drivers, traffic controllers and other stakeholders, traffic alerts and notifications should also be made available to smart city residents of the respective affected areas over mobile phone for situation alerts and better preparations in case required. iSMART POC has successfully proved and demonstrated that how a low cost, Smart Traffic Management System can be designed and built by using available IT Infrastructure, Off the Shelf Embedded Hardware Boards, Sensors and Free license Software. Though the POC has not full-fledged implemented all the features and functionalities of Smart Traffic management System, it is undoubtedly proved the usefulness of Smart Traffic Management System and some of its essential features. Latest technologies such as IoT, Machine to Machine communications, Advanced Video and Image processing, Secure Data Communication and Transmission, Advanced Data Analytics have made it possible to have recommendations of best routes well ahead of start of journey, paying of toll charges with vehicle moving, traffic situation alerts and notifications at right time, collaboration among vehicle drivers/passengers through V2V Communication, better incident management, effective handling of emergency situations on roads etc.

**Mandhare, P., Kharat, V. and Patil, C., 2018. Intelligent Road Traffic Control System for Traffic Congestion A Perspective. *International Journal of Computer Sciences and Engineering*, 6(7), pp.908-915.**

Ever increasing population growth in urbanization because of migration from rural to urban and economic expansion has made an impact on the rapid increase in vehicle population. It puts a massive amount of pressure on transportation infrastructure and particularly on traffic management practices in cities and town of the urban area. Based on worldwide best practices observed in countries like the USA, Dubai, Canada, United Kingdom etc., the ITS application appears to be providing promising solutions for traffic control and management. In this paper, we have tried to explore the world of ITS and an efficient model can be designed by an integrated approach with a number of sensors and technologies. On another hand, each technology has its own limitations. As far as a country like India is concerned, there are many physical, social, economic challenges in front of ITS to grows efficiently. In India, under the “Smart City” project many government organizations have taken initiative for implementing a number of ITS projects. In order to avoid accidents on highways, a proposal has been initiated and communicated to the Maharashtra Government to install Intelligent Traffic Monitoring system [51]. India has started a big take off towards the journey of ITS.

**METHODOLOGY**

* Develop an application.
* Application will be developed using Android Studio (Java/Kotlin).
* App will connect customer to server of Traffic Control System.
* Customer will share picture and location.
* Google APIs will be used to share current location of user.
* Server will contact nearest Traffic Control Booth.
* Controller will send the nearest help.

Increase in traffic congestion leads to emission of harmful gases into the environment. This severely contributes to the pollution. Therefore, we will collect data on pollution from the IMD (Indian Meteorological Department) website and analyse the data using machine learning to study the impact of traffic congestion on pollution.

**APP DESIGN**

Graphical user interface, website

Description automatically generated

Fig 1

**A picture containing chart

Description automatically generated**

  Fig 2

**E-R DIAGRAM**

Diagram

Description automatically generatedFig 3

**Description of E-R diagram**

The ER diagram consists of basically two entities namely: user and traffic control room

The two entities are connected by relationship complaint.

The entity user who will register the complaint on the app has following attributes,

User’s login credentials through which user will login to the app.

User’s contact number that the user will use to register the complaint.

Location of the user which will have the details of location of traffic jam.

Further, the entity traffic control room which has the details of the police stations to which it will transfer the complaints has following attributes ,city where traffic control room is located. Police stations which have the attributes namely, name of police station, station id and contact details.

**CONCLUSION**

The project aims to eliminate the drawback of the existing traffic management system during road congestions.

This project will help in efficient management of traffic on roads across the city. Commuters will be able to inform about traffic jams to the traffic police in systematic and efficient manner. The location of the site will be accurately available to the traffic police hence the help will reach in shortest possible time.

The project titled “Traffic Management System” will prove out to be beneficial and efficient for both commuters and management.

**REFERENCE**

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