



ADAPTIVE TRAFFIC MANAGEMENT FOR LIFE SAVING SERVICES IN SMART CITIES

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Abstract: Each Nation is presently confronting a major issue of overpopulated vehicles which are driven for numerous hours leading to traffic congestion. These traffic congestions lead to major sorts of consequences, like numerous times ambulances like emergency services get stuck in the traffic which causes delays in reaching the medical center as a result patients die waiting in the traffic jams. To overcome this issue we are recommending an unused innovation to alert the traffic that emergency services like ambulances will surpass them. And as soon as this message gets transmitted an alert will be displayed stating the distance with the Ambulance, so that they can clear the road by moving their vehicle to the left side of the road in order to provide a clear path or a lane to the emergency vehicle. This helps the ambulance search for the shortest way and make it fast in an emergency. Smart Traffic systems will help the patient get to an emergency service as shortly as possible. This will reduce the death count and also make the city smarter.

Index Terms – Overpopulated, Congestion, Ambulance, Emergency, Traffic.

1.Introduction

Life is a gift of God and it's our duty to save our lives. In today's world adulation is common in food items which affects our health badly. Whenever any medical emergency is caused, the first thing we do is to call the Ambulance but at the same time we know that an ambulance will take too much time to arrive as well as will be stuck in heavy traffic Jams. Most of the time, Patients need immediate treatment to save their lives. But it's not possible due to poor traffic management in our country. Though ambulances need not to follow the traffic rules, it still reaches late. So, we are introducing an idea to solve this problem by providing a new feature in google maps helping the ambulance searches for the shortest way and makes it faster in an emergency . Smart Traffic systems will help the patient get to an emergency service as quickly as possible and also to get to the hospital shortly .

2.Literature Survey

According to IEEE standard DOI 10.11.09 [1], an ambulance can easily move to the intersection of vehicles without delay. And having a smooth flow to get to the hospital. This can be done by directing the way to the hospital. There may be many ways to get to the hospital soon. But only a short route is indicated to direct the ambulance to get to the hospital and assist the patient giving the necessary treatment.

Svetlin Antonov and Manav Kandhari "Smart Traffic Control System For Ambulance" [2] help users effortlessly book a slot for parking through the software proposed. This will help in avoiding the traffic congestion in commercial areas, through this paper reservation system for parking was made easy. Through the application one can look for parking slots and check for the availability. Allowing the emergency vehicles more space that was used due to the parking of vehicles on the road side.

Dr. Muayad Sadik Croock, Asmaa Shaalan Munem, "Smart Traffic Light Control System for Emergency Ambulance" [3] In emergency systems, to make sure that the patient reaches the hospital on time as soon as possible. This helps the ambulance search for the shortest way and make it fast in the emergency . To satisfy this it was proposed to take the help of the implemented traffic lights and by selection of the best paths with the help of crowd monitoring sensors. This system included two main parts: an ambulance and data center. The data center helps in collecting the information related to the location of the patients and the nearby hospital as well as to locate the current location of an ambulance and detect the crowd through sensors. This algorithm will help the

ambulance find an optimal and fast path in which the patient can be reached to the nearest hospital safely and fastly. Also it was proposed that signals can be generated once the route is finalized to make the traffic signals green.

S Yuvaraj², Yazhini Priyadharshini Rajesh¹, Varsha Srinivasan¹ and M Manigandan² “Intelligent traffic control with ambulance acquisition” [4]. The paper says that the problem of city traffic congestion is worsening. Traffic is increasing due to the increase in traffic as the roads are very narrow. They suggested that a traffic reduction program could be implemented using image processing by detecting blobs and tracking them. The program will assist in locating vehicles with images instead of pavement sensors. They also plan to provide emergency vehicle solutions such as ambulances parked on the road to remove Bluetooth routes [5], ensuring timely assistance to those in need.

Madhav Mishra, Seema Singh, Drs. Taskeen Nadkar, Dr. Jayalekshmi .K.R [6] also provided an advanced warning system for emergency ambulances. This study utilized existing technologies and concepts called Internet of Things (IoT). The architecture used is server-client network. Road lights including traffic lights can be upgraded to N numbers so that traffic control can be done throughout the city by staying in one place. In an ambulance system, patient data in an ambulance can be sent to hospitals via GSM technology [7]. However the ambulance driver needs to take another route in case of traffic congestion to get there faster. Therefore the proposed work of Sarika B. Kale, Gajanan P. Dhok [8] not only considers the importance of vehicles but also the traffic congestion and the efficient and effective control of traffic lights and RFID accuracy. It has a Camera so it improves the performance of the Traffic Infringement Detection System [9].

Ahir et al. [10] also suggested the android system and hardware module to use the traffic signal. This android app has four buttons that display four indicators. Depending on the route the ambulance will take to get to the hospital, the appropriate direction and instruction are generated by a specific signal. In this android app, patient information is also stored containing name, blood group, age and other useful information. Hardware road hardware module has an Arduino for road signals. Contains a Wi-Fi module, with the help of trying to capture information from the server and connect the android app directly with the traffic signal.

According to reference documents, the highest course of action is to make the emergency vehicle look the fastest way. Another recommended technique [14] was to inspect the emergency vehicle and find that all the different signs of a traffic light on the emergency vehicle should be turned green, allowing the vehicle to pass through and reach the hospital as soon as possible.

3. Proposed work

According to research it is seen that the daily traffic is the major problem for emergency vehicles like ambulances. This situation can be seen in most metropolitan cities today. Thus this project is developed to overcome this problem and manage the availability and make the ambulance reach on priority basis to the patient as well as the hospital.

Through this paper a new update is suggested, which will alert the people on the way of the Ambulance. This update to the google map will provide a faster way for the ambulance to arrive at the hospital as early as possible and can save a life. This update will not only give a clear way to ambulances but also will save many lives of people dying because of ambulances stuck in heavy traffic. Smart Traffic systems will help the patient get to an emergency service as quickly as possible and also to get to the nearest hospital as early as possible. In today's world everyone uses google maps while driving even if the way is known, so this system will help the ambulance driver to locate the patient and the hospital in less time regardless of how clogged the way is and also to the drivers nearby to detect the emergency vehicles like ambulances nearby them to make a path available for it. To make this possible an update is suggested that should be done, in which every vehicle receives an alert when an Ambulance reaches them. Through this update a three lane system can be introduced when an alert is notified, this means that whenever an Ambulance is detected in the fixed distance radar that can be implemented with the help of GPS monitoring system, the driver on the way will get notified and will move to one side of road such that a single lane is created for the Ambulance .

According to the research, in the first step GPS will monitor the Ambulance moment and will share its current location with google maps and google maps will help find the shortest path for the ambulance to reach the hospital in minimum time. And later Google maps will pass this information with the people who are using google maps for their navigation. And as soon as this message gets transmitted an alert will be displayed stating the distance with the Ambulance, so that they can start moving their vehicle to the left side of the road in order to provide a clear path or a lane. This same will repeat with next drivers ahead until the ambulance reaches the hospital. Also the information will be shared with traffic police so that to clear the traffic jams and turn the traffic lights green in advance. As in this, people within certain range will be notified like what happens in current situation with the help of siren, the siren alerts the other driver to give way to the Ambulance similarly this update will serve, as this will be generated through satellites this will be faster and can be limit to a specific range so that it does not disturb the usual traffic as in case if all the people are notified through out the way even the Ambulance is two far from them will increase the congestion on road, creating other problem . Also it is important to check that Ambulance is using the application and not by others to save time. This will also make certain that the Ambulance arrives on time as early as possible and also in case of emergency a Doctor is ready ,this will help save many life as many deaths are caused due to delay in first aid that can be given by the doctor in the Ambulance or delay in getting proper treatment due to traffic on road.

With the help of this update not only the life of the patient can be saved as in case of emergency the patient can go to the nearby hospital as early as possible. As statistics show that approximately one loses life every 30 hours even though on a fast lane road of densely populated and express highway. Though in modern ambulances special devices are installed to provide proper assistance to the patient inside the ambulance from the doctor at the hospital and also helps the doctor prepare according to the condition of the patient but the important thing is the arrival of the patient in the hospital in time. For this idea, the internet is mandatory at both server and client end.

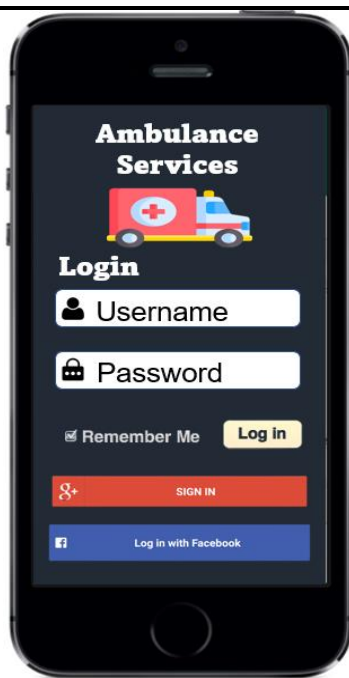


Fig. 1 Login Page of Mobile App

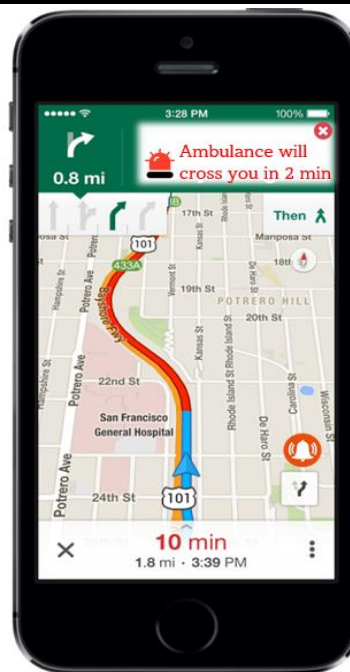


Fig. 2 App Interface

4.Results And Discussions

When the ambulance marks the location and starts heading towards the patient and then towards the hospital in case of emergency people within the range of 5 km moving on the same path will get notified,also the traffic light changes to green so that the Ambulance can save life in an emergency. So that the patient’s life can be saved.

Availability of Ambulance

Ambulance is an emergency vehicle used to transport patients to hospital with all basic support in it. In India we face a scarcity of ambulances and the ambulances which are available, most of the time they are stuck in traffic which results in delay to arrive. Many People lose their lives in ambulances which are stuck in Heavy traffic. The condition of the Indian healthcare system may be gauged from the truth that there are only 25,851 ambulances for approximately 130 crore people across the country.

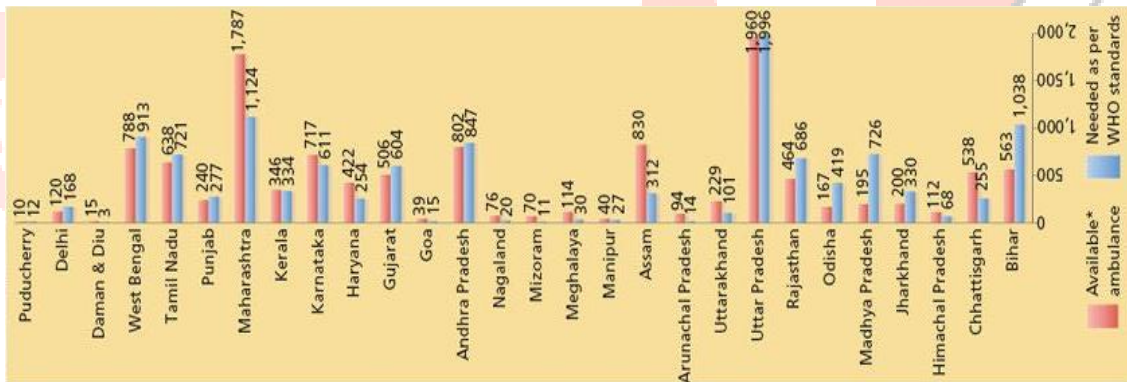


Fig. 3 Graph Showing the need of ambulance VS ambulance we have

Need for Ambulance on time

In India, most of the time ambulances arrive late. And if comes on time and then later stuck on time which causes delay in treatment due to which many people lose their life on road. And it's most common for people who meet with road accidents. According to the Times of India approximately 146,133 people died in road accidents in India in 2016 [15]. Unfortunately, about 30% of deaths were caused due to ambulance delays. In today's world the number of accidents per day is increasing dramatically as well as the number of deaths resulting from it.

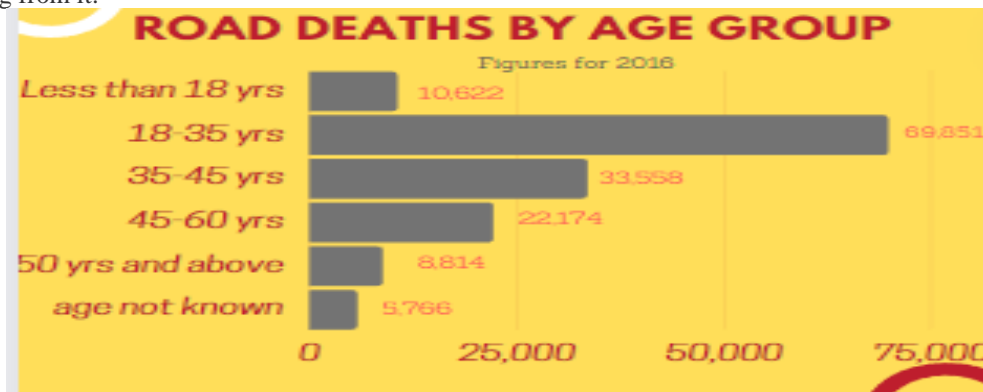


Fig. 4. Road Accident Death Graph

5. Work for the Future

This idea is being developed to help the ambulance get to the hospital as quickly as possible. Consider the different aspects of traffic and how the program will respond to them. Secure communication between ambulance application and server, so that only authorized personnel are allowed to do the same. Send patient data to the hospital before reaching them for necessary action. In the future this model could be used for all emergency services such as fire brigades, Special Police stations and other facilities. As firefighters need to report their destination as soon as possible in the event of a fire accident, so with the help of this they can move faster. Even in the future this model can be used by railways as people standing and waiting at railway crossings will get the alert before the train crosses them because in India many people put their lives at risk just to cross the railway crossing, when signals are red. So there is great scope for this update in making the lives of the people more safe.

6. Conclusion

This paper provides the benefits of Smart Traffic Management System as the existing system does not provide a transparent path for emergency vehicles during the traffic congestion. From this it can be said a small change can save a life either it can be due to parking or congestion, driving habits of drivers need to be corrected to make it safe. Also it is important as suggested above that emergency services like ambulances need fast and show path to save life and our proposed work can help in achieving the goal in case of a congestion on the road. Helping save many lives due to delay in the patient's arrival. So this small change may help save many lives.

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