



## Real Time Web Based Bus Tracking System

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**Abstract**— Due to rapid increase in population, there is need for efficient public transportation system. Because of population it keeps increased burden on public transportation like bus etc. Therefore the smart system is necessary which provides real time information of bus to remote user. So we proposed a new system which overcome the drawback of public transportation system. So our system handle all the data about current location of bus and by using this data the real time tracking of bus can be done and this information is then given to remote user who want to know the real time bus information. For development purpose some technologies like GPS (Global Positioning System), Google maps and GPRS (General Packet Radio Service) are used. The system includes web based application, which gives real time location of bus on Google Maps.

**Keywords**— GPS, GSM, GPRS, Google Maps

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### I. INTRODUCTION

Public transportation systems is the main problem which play an increasingly important role in the way people move around their communities. It is a very cost effective mode of transport. Due to reasons such as heavy traffic and roadwork etc., most of the buses are delayed in time. People have to wait for long time in the bus terminus without even knowing when the bus will arrive. Anyone who want to use the public transportation system, can find the time of arrival of particular bus at the particular destination even at their homes and plan their departure from home accordingly. But the bus arrival time cannot be guaranteed due to unexpected delays in traffic congestion. Our main focus is to provide the user with such a system which will reduce waiting time for bus and will provide him with all necessary details regarding the arrival/departure time of the bus, its real location and expected waiting time. So a systematic tracking system is required to find out the current location of a bus and the dynamic arrival time. For best tracking result, GPS and GSM technology can be used. The GPS and GSM based system can provide all specifications that are necessary for tracking a vehicle. The proposed system can find location of the bus and inform the central controller at the bus terminal. The information is uploaded in the server and the commuter can access the information via the web application using internet even at their homes or work place. Additionally, system also provides a web based application interfaced with Google Maps to display all transmitted information to the end user along with location of the bus on the map. An internal global timer is used in web application which refreshes the tracking web application every forty seconds and fetches the latest location and other customized vehicle parameters and updates the end user with the latest information of the bus.

By helping travelers move from single-occupancy vehicles to public transportation systems, it can reduce traffic congestion as well as environmental impact. Our purpose is to increase the satisfaction of current public transportation users and help motivate more people to ride. If passengers had an easy way to see which bus is near to their location and approximate time it will take to reach the stop, in real time, they can make a more accurate decision of whether or not to wait at a stop. Our proposed system will provide pedestrians with this convenience. The bus location is determined using GPS, then the information is transmitted. The transmission mechanism can be satellite, terrestrial radio or cellular connection from the bus to a radio receiver, satellite or nearby cell tower. A wireless communication system is used for transmission purpose once the positioning data along with other custom data is collected.

### II. LITERATURE SURVEY

For bus tracking many designs that have been proposed and implemented. In the case of implementation or in the case of the system design all proposed methods and implementations are unique. The real time bus monitoring system GPS module is installed on the buses for transmission of the real time location of bus to receiver boards which is installed on the bus stops. The centralized control unit get the GPS data of the bus location and it activating LEDs in the approximate geographic positions of buses on the route. The device will not require an external power source, it will be portable and sustainable and eliminate energy costs [1].

Abid Khan and Ravi Mishra proposed the embedded system which is a single board system having GPS and GSM modems and ARM processor to track vehicle. This system has large capability, low operation cost, strong expansibility [2]. Swati Chandurkar, Sneha Mugade, et al. proposed real time bus monitoring and passenger information system. The system gives current location of buses and estimated arrival time at different stops in their respective routes. The link updater is used to locate the bus position and the current route of the bus. The estimated arrival time is updated at control unit and shares this information to passengers using display board at bus stops [3]. S. P. Manikandan, P. Balakrishnan

proposed the real time query system for public transport service using Zigbee and RFID is suitable to passengers demand and and provide information such as bus location, bus number and number of persons inside the bus in real time. This system provides efficient as well as low cost public transport system [4].

Madhu Kumar, K. Rajashekhar, et al. proposed, Design of punctuality enhanced bus transportation system using GSM and zigbee. In this way service quality of operational efficiency is improved and passenger is also able to get the information about the respective bus [5]. The tracking system can inform the location and route travelled by vehicle and that information can be observed from any other remote location. The system also includes the web application that provides exact location of target. This system enables to track target in any weather conditions [6]. V. Yamuna, G. Rupavani, et al. proposed GNSS based bus monitoring system. The main objective of this system is to reduce the waiting time of passenger in bus stop by sending information about the location of buses to the passenger through SMS. GNSS based web application is developed which provide which provide real time location of bus on Google Maps along with speed [7]. R. Manikandan and S.Niranjani implement real time public transportation information using GSM query response system. The system is capable of a tracking large number of buses simultaneously, detect their service routes and predict arrival time to down station with an acceptable accuracy. The microcontroller acquires data from the GPS module and sends to the control point by using the GSM module [8]. G. Raja, G. V. Karthik, et al. proposed bus position monitoring system to facilitate the passenger. The wireless communication technologies like GSM & GPS are used to send the information about number of seats available in the bus to bus station and current location of bus on the route respectively. Real time passenger information system uses variety of technologies to track the location of bus in real time and generate the prediction of bus arrival at stops along the routes [9]. In this paper, they have presented a smart bus tracking system which is based on GPS, GSM, QR coding and Google's map. The proposed system, estimates the arrival times at specific bus stops by tracking buses and informs the users through e -mails and SMSs. The system helps to passengers from unnecessarily waiting at bus stops and enables them to use their time more efficiently.

### III. PROPOSED SYSTEM

Generally our system is operated by GPS which is attached with the bus. Firstly the satellite signals are received by it and then the position co-ordinates with latitude and longitude are determined by it. Proposed system uses (AVL) Automatic Vehicle Location. By using AVL the geographic location of a vehicle can be determined and transmitted this information to a remotely located server. With the help of GPS and transmission mechanism the location is determined. It could be a satellite, terrestrial radio cellular connection from the bus to a radio receiver, satellite or nearby cell tower. After receiving the data the tracking data can be transmitted using any telemetry or wireless communications systems. GSM is used generally to transmit the data. Generally remote user can access the information of a bus based on users source and destination. Proposed system give the exact location of bus. Bus tracking technology is advantageous for tracking and monitoring a bus.

### IV. ARCHITECTURE

The proposed system has 3 components

1. Bus unit
2. Central control unit
3. Client side application

In bus unit a bus has GPS device attached with it which sends its coordinates i.e. longitude and altitude after every fixed interval of time to the main server. When the coordinate with timestamp received from bus unit is compared with the previous coordinates and if there is any difference then the coordinates are updated and sent to server over GPRS network (internet).

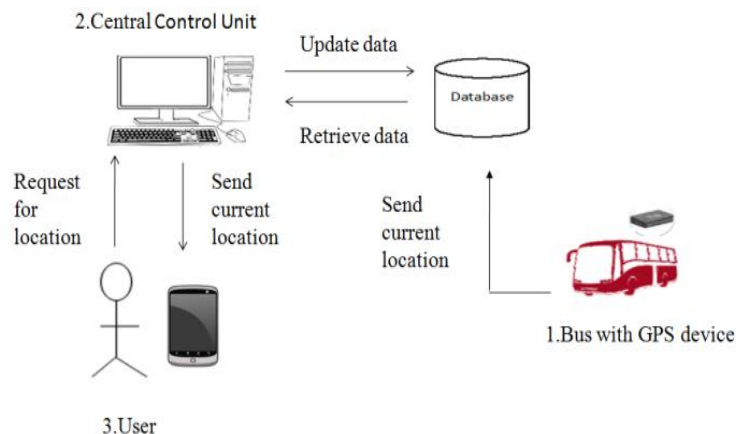


Figure 1. Architecture of the proposed system

The location details are stored in server in the format such as ID, longitude, latitude, timestamp etc. To identify each bus among the various buses here ID is taken. Each bus has given one unique identification number. Server is the most important module in this system which acts as central repository of system. In this system the whole information is stored

and maintained by server. Server is the intermediate between bus module and user module. These database consist of real time information about bus it includes bus routes , actual arrival/departure time and real time location of bus. Server service the user module by providing required information to it. The user side module is nothing but an interactive web based application which services the various function of system to passengers. The user side module takes input from passenger. When user send a request the application fires a query to central server for accessing the information stored in central server database. This application gives support and interact with various clients to provide service to user requests. The system facilitate the real time tracking of bus.

## V. CONCLUSION

The proposed system is successfully designed, implemented and tested and the following conclusions are made. The present system reduces the waiting time for bus. The system involves the tracking of bus at any location at any time. All the current data is stored to the server and it is retrieved to remote users via web based application. The system is easy and simple for user to get information visually shown on Google Map. User is freely get the web based application for real time tracking of bus which provide interactive interface environment. So by using this application remote user can just wait or they may reschedule their journey according to bus availability. So this paper presents a system which provides high practical value in the modern fast era. The system has high practical value and cost efficient.

## VI. FUTURE SCOPE

This project is having a wide scope. A web based application which can be further modified using cloud. Use of video camera to this system would take this system to the next level in the field of security. It will help to monitor the crimes that happen now a days which is witnessed by common people every day. This would prove a major breakthrough in reducing the crime rates. Also, with use of motion sensors the speed of the bus can be calculated.

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