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# City Bus Tracking System

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***Abstract* - The ability to track vehicle is useful in many applications including public transportation systems, fleet management and others. Furthermore, the number of vehicles on the road globally is also expected to increase rapidly. Here, the development of City Bus tracking system using the Global Positioning System (GPS) is undertaken with the aim of enabling users to locate their City Bus with ease and in a convenient manner. The system will provide users with the capability to track City Bus remotely. This project presents the development of the City Bus tracking system's hardware prototype. Specifically, the system will utilize GPS to obtain a City Bus's coordinate and transmit it using GSM modem to the different bus stations. The main hardware components of the system are PIC microcontroller, power supply, LCD, GPS and GSM. The developed City Bus tracking system demonstrates the feasibility of near real-time tracking of City Bus and improved customizability, global operability and cost when compared to existing solutions.**

## I. INTRODUCTION

Government has facilitated us with enormous facilities. One of them is the public transport facility more over bus transport facility. A huge number of crowds take the benefit of public buses. But there are few of the major problems each individual deals on daily basis. A passenger often faces the problem in deciding if it would be quicker for him to wait for the bus or to hire a cab/auto to reach to the destination. Many of them are often late for their work; students arrive late for classes, as a consequence of their dependency on the arrival and departure of buses they take. The time when they realize that they should have been looked for other options, it's already too late. All this could not take place if we provide passengers with an easy access to see which bus is near to their location and approximate time the bus would take to reach their stop, in real-time. With this little help, they can make appropriate decisions, that if or if not to wait at that stop. City Bus Tracking System will provide passengers with such facility. Transportation has a very a vital role to play in day to-day life. Most of the people are being carried by the public transportation system. Because of the ever increasing development the requirement of this system is increasing, that too in time effective manner.

Public transportation facilities have to be well-established and active. The major transport facility used by the people in rural areas, also in cities, is the bus service system. Most people choose to travel by bus daily, and thus, this can reduce fuel consumption, air pollution, and traffic. Although many buses are available for various routes, yet no appropriate information about the timing is available. Even if the user knows the arrival time, the movement of the buses is unknown, which can be affected by various circumstances like traffic congestion, weather, and randomness in passenger demand and many more incidents. Due to insufficient information, people waste their time at the bus stop waiting for the bus. To reduce the waiting time and making the bus transport more attractive and convenient, we have developed a client-service based application that displays real-time information about the buses which includes the arrival and departure time, the bus schedule, and its live location on the map. To track the bus, GPS (Global Positioning System) is used. Our proposed system requires an Android phone with a built-in GPS receiver in it. The GPS location of the bus is uploaded in the server, and then the user can access it via a web application using the internet. Our system is interfaced with Google Maps, which displays the live location of the buses on the map. By using the web application, the user can check the timing and location of buses at their home or workplace itself and can plan their departure accordingly.

## II. METHODOLOGY

The proposed system is operated by the Android platform smartphone, with the built-in GPS receiver. The bus location is tracked using GPS, which is based on the trilateration mathematical principle. The location of the GPS can be determined as it is capable of receiving data from at least three satellites. To receive the signal from the satellite, the conductor should turn on the GPS in his Android smartphone. The device receives the GPS data and sends the latitude and longitude values of the location of the bus to the server at regular intervals.

 

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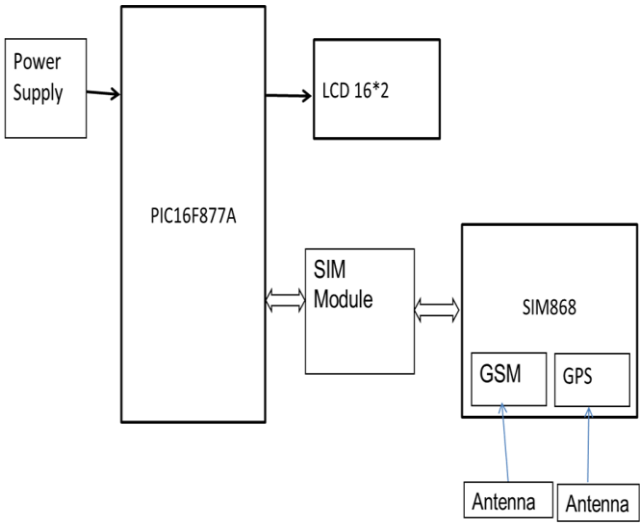


**Figure 1: Block Diagram of Proposed System**

In this system, the server is the most important module and acts as the central repository of the system. It acts as the intermediate between the bus module and the user module. Here, the whole information is stored and maintained in the MySQL database. A web application is used to facilitate the submission and request of information to the database server. In MySQL, tables are created to store various types of data. Each table comprises the username and password of the conductor or the authorized person, live coordinates of GPS, route ID, bus number of all the buses, bus schedule, passenger details, longitude, the latitude of all the buses and distance between them and also the order of bus stops for various routes. To distinguish each bus among the various buses, it is thus, provided with a particular ID that is unique and is stored in the database. Additionally, along the routes in which the bus travels, points are set up at the closest bus stops. These points are stored in the database and are necessary to calculate the distance between the passenger and the bus. This increases precision in obtaining the data. To depict the route in which the bus is traveling, each route is provided with a route ID and the order of bus stops on that route are stored. The order of bus stops, and the route id helps to depict the direction of bus, and also to provide the longitude and latitude values of bus to calculate the distance. Google Maps are used to plot the location of the bus. To increase the accuracy in locating the real-time location of the bus on the map, real-time coordinates of the current bus are uploaded to the server where it is compared with the coordinates of the closest bus stop and the distance between them is calculated.

## III. RESULTS AND CONCLUSION

Tapping the wind for renewable energy using new approaches is gaining momentum in the recent years. The purpose of this paper is to provide some fundamental results on the bladeless wind system and serve as stepping stones for the future development of bladeless wind power generation system. The forces that is beneficial or useful to generate power in bladeless are different from those in conventional horizontal axial wind turbines. Our device captures the energy of verticity, an aerodynamic effect that has plagued structural engineers and architect for ages. As the wind bypasses the fixed structure, its flow changes and generate cyclic pattern of vortices. As the wind energy is powerful and consistent, the usage of conventional wind turbine for utilizing the wind energy in lesser area and cost is most possible. Hence bladeless wind energy helps us to achieve this criterion. This project has three main advantages: 1) Utilizing less area. 2) Generation of high power. 3) Economical.

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