

# Application For Smart Bus Monitoring System

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**Abstract** – As the people move around their communities' public transportation is main problem. Due to the cause of traffic and roadwork, etc., on the roadways most of the buses are delayed in time. So, that lot of people had to experienced time loss because of waiting for the bus at the bus stop. Therefore remote users need a smart system which provides real time information of bus. 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 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. GSM (Global System for Mobile Communication) is most widely used for alerting system. Alerting system is essential for providing the location and information about vehicle to passenger, owner or user. Google maps are used for development purpose. Here we highlight implementation of geographical information services and location based services for monitoring a system. Using all this aspects this monitoring system is suitable to monitor and transportation system. This paper focuses on the implementation of a Real Time Passenger Information (RTPI) system, by installing GPS devices on city buses. The Real Time Bus Monitoring and Passenger Information system is a standalone system designed to display the real-time location(s) of the buses in city.

**Keywords-** *Global Positioning System (GPS), Interactive maps, Monitoring and Management System, Smart phones.*

## INTRODUCTION

In the daily operation of public transport systems, mainly that of buses, the movement of vehicles is affected by different uncertain conditions as the day progresses, such as traffic congestion, unexpected delays, and randomness in passenger demand, irregular vehicle-dispatching times, and incidents. Many passengers are often late to work, students are late for classes because they decide to wait for the bus instead of just simply using an alternate transportation. The services provided to passengers by transport systems are very important. Public transportation systems play an increasingly important role in our life. It is a very cost effective mode of transport. A variable message sign showing the showing the bus arrival time could reduce the anxiety of passengers waiting for the bus. So we are providing an Android application which will provide the information of bus location tracing and monitoring. Such precision docking capabilities facilitate fast loading and unloading of passengers with special needs and thereby reduce waiting time and improve ease of access for all passengers. GSM and GPS based tracking system will provide effective, real time vehicle location, and reporting. The system fetches the geographic location and time information from the Global Positioning Satellites.

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. The maps given to the driver in the system plays most important role in this field. When large object or vehicles were spread out over ground, the owner corporations often found it difficult to keep track

of what was happening. They required some type of system to determine where each object was at any given time and for how long it travelled. GSM and GPS based tracking system will provide effective, real time bus location, and reporting. A GPS- GSM based tracking system will inform where your bus is and where it has been, how long it has been. The system fetches the geographic location and time information from the Global Positioning Satellites. So we are providing an Android application which will provide the information of vehicle location tracing and monitoring. It also includes the feature of density measure for the user convenience and nearest bus available on the route and will make the user up to date as bus moves.

## II- LITERATURE SURVEY

### 1. Advanced Vehicle Tracking System on Google Earth Using GPS and GSM. [1]

In this paper GPS based vehicle tracking/navigation system is implemented. This is done by fetching the information of the vehicle like location, distance, etc. by using GPS and GSM. The information can be transformed with the following features: The information of the vehicle like location, etc. is obtained after every specified time interval defined by the user. Then this periodic information of location is transmitted to monitoring or tracking server. This transmitted information is displayed on the display unit by using the google earth to display vehicle location in the electronic google maps.

### 2. GSM & GPS based tracking system [3]

This system is helpful for public transport vehicles such as buses and taxis, it provides Tele monitoring and management system for the transportation of the taxis and buses within the city. In this paper the system mentioned consists of an —On- board module which is mounted in the vehicle which is to be tracked. This on-board module consists of Global Positioning System, a GSM modem and ARM processor. The navigation message which is broadcasted by the GPS position satellite is received and resolved by the GPS receiver of the vehicle terminal. This satellite computes the longitudes and latitudes of vehicle coordinates, then transform it into the short message form by using GSM

communication controller and this message is sent to the monitoring center through the GSM network.

### 3. GSM and GPS based vehicle location and tracking System. [5]

This paper uses to a RF transmitted; the RF transmitter is attached with the vehicle which consists of its own identification. The data which will be continuously transmitting to the RF receiver that is connected to the microcontroller. The GPS will receive the location of the vehicle and will transmit this data to the microcontroller. Supposedly the RF transmitter is not receiving the signal from the RF transmitter then the receiving unit triggers a signal to the microcontroller, and from this signal we can identify the theft. If it is identified that the vehicle is theft then it automatically sends location of the vehicle to its user as the owner of the vehicle receives the information in the form of SMS through the GSM modem. This system is much simpler and cost effective than the others. The vehicle is automatically stopped if a password like SMS sent by the user.

### 4. Application Review.

An application has been implemented in Pune, named “Pune Bus Guide”. This application gives the way to the destination correctly, but the number of drawbacks that it has is greater than the number of advantages. It does not show the passengers current location even if he/she is connected to the GPS. Also, this application has been proven useless as it does not display the bus numbers, so the passengers find it very hard to know the number and time of arrival of the respective buses. It does not have a real time bus tracking service or does not even generate maps for the users ease. This application has never been updated ever since its development. Moreover, this application has bugs which makes it all the more difficult for the user to use it.

## PROPOSED SYSTEM

The proposed system consists of following two modules:

1. Bus module
2. Client side application (User module)
3. Server module

1. *Bus module:*

The bus is tracked by installing a special device or GPS transceivers in the bus. GPS works in any weather conditions, anywhere in the world, 24 hours a day. To use GPS there are no subscription fees or setup charges. To calculate the position GPS receiver is capable of receiving signals from at least three satellites. This device receives the GPS data and sends the data at regular intervals to the server. Then the server analyses the data. Then to receive the signals from the satellite the GPS device is turned on. Now the device is capable of receiving the latitude and longitude values of the location of the bus. At any point of time the GPS receiver gives the location values. Now the bus unit has the coordinates with timestamp which is then compared with the previous coordinates and if there is any difference then the coordinates are updated and sent to server over GPRS network (internet). The location details are stored in server in the format such as ID (bus no), longitude, latitude, timestamp etc. Each bus has its own GPS device with unique SIM card. Server is the most important module in this system which acts as central repository of system.

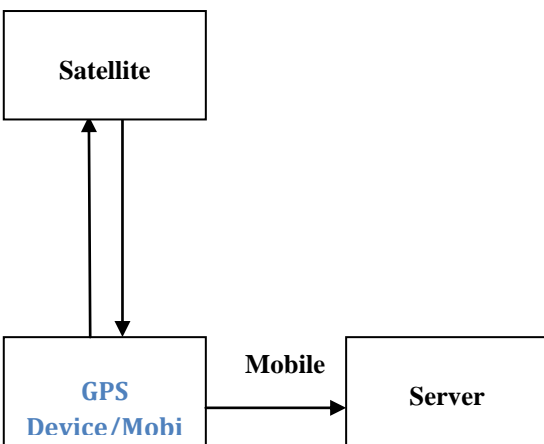


Fig.3.1 Bus module

2. User module:

The user side module is nothing but an interactive application which services the various function of system to remote users. The user side module takes two inputs i.e. one is source which indicates where the remote user is now and second is destination which indicate where he/she wish to go. When user send a request the application fires a query to the server for accessing the information stored in server database and gives the list of available buses according to remote users source and destination. Now it's users task to select or choose particular bus number to know the real

time location of bus or other information. After selecting a particular bus number the application shows the real time location of that bus on Google map. This application gives support and interacts with various clients to provide service to users requests. The system facilitates the real time tracking of bus.

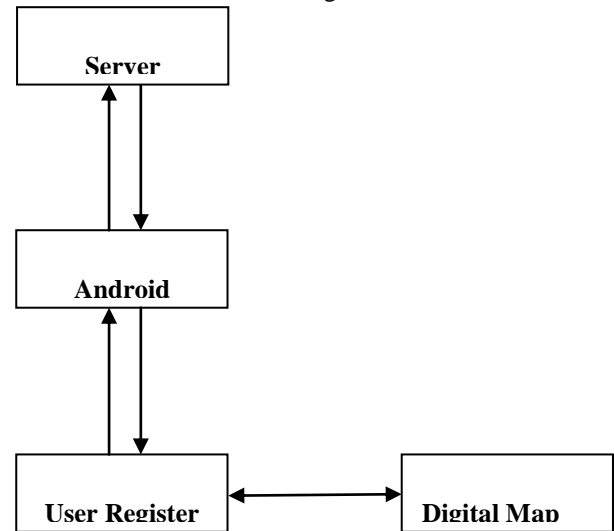


Fig.3.2 User module

3. Server module:

In this system the whole information is stored and maintained by server. Server is the intermediate between bus module and user module. This database consists of real time information about bus it includes bus routes and real time location of bus. Server provides service to the user module by providing required information to it.

METHODOLOGY

4.1 Implementation using Android:

The implementation of Mobile enabled bus tracking and scheduling system been carried out using Android emulator. In addition reminder for topping the credit of RFID enabled ticket is also intimated on Android enabled handset of Commuter. The implementation does not deal with details on computing Expected Arrival time of bus based on information received from RFID-GPS towards bus being tracked and forms part of another publication. Android is becoming very popular because the source code is completely free; also, Android is highly suitable for expansion as the developer see fit, so building a mobile application for Android devices is very common these days due to the mentioned reasons. Bus locations and routes are shown on dynamic maps using Google maps.

The application is designed and tested where the users assured that the application gives the real time service and it is very helpful for them. we proposed GPS based Bus Tracking and Monitoring system in which the tracking is done by implementing maps with GPS facility. The Android Application is designed for users where they can access/view the daily timetable of bus, bus route, location of bus, and bus arrival and delay timing information. Our main focus is to provide the users with such a system which will for sure reduce the waiting time and will provide the users with all necessary details regarding the arrival time of the bus, its exact location and expected waiting time. of all the buses including the bus name, number, departure and arrival time.

#### 4.2 Block Diagram:

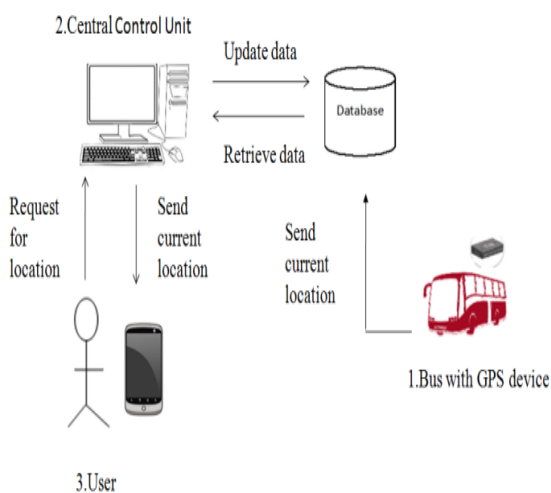


Fig.3.1 Block diagram of bus tracking system

We are proposing two modules for the bus tracking system which shows the how system works with the details structure.

The proposed approaches are as follows:

1. Tracking system: In this approach the GPS device or GPS installed mobile receive signals from satellite and calculate its position. This data sends to server using mobile network for storing purpose. Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and longitude are determined by it. The location is determined with the help of GPS and transmission mechanism. After receiving the data the

tracking data can be transmitted using any wireless communications systems.

#### 2. Android App:

In this approach data access from server on mobile androids application using GPS.

#### CONCLUSION

We have proposed a system in which users can be more comfortable and satisfied in their bus travel to reach the required destination in a quicker manner. This system is completely integrated and it becomes possible to the user to track his bus very easily at any time and from anywhere. The proposed system, basically tracks the busses and prevents passengers unnecessarily to wait at bus stops and enables them to use their time more efficiently. In this system we are using GPS & GSM are used to track the bus. Using this system the user can determine where the bus is. The user is able to access the position of his bus at any instant of time. This system is reliable and very secure.

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