



## AUTOMATED BUS-STOP ALERT SYSTEM FOR PUBLIC BY USING GPS

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### ABSTRACT

The aim of the project is to design an embedded system which is capable of alerting the person through voice about the bus stop. Generally a person new to town/city finds difficulty in getting off the bus at proper station. This system alerts the person with location name whenever a station has reached. This system consists of a GPS receiver, a voice circuit. GPS stands for Global Positioning System. GPS is a technology through which the location can be known. This system uses satellites to calculate the location on the earth. A GPS receiver is required to get the location which receives continuously the location and time information from the satellites. when bus reaches to the bus stop microcontroller send message to the students The controlling unit of the system is a Microcontroller. GPS receiver and voice circuit are interfaced to the Microcontroller. The controller is programmed in such a way that the GPS data is continuously compared with the bus stop locations and alerts through predefined voice message of that location if both matches. The Microcontroller is programmed using Embedded C language which provides a very efficient way of performing the task.

**Keywords-GPS tracking , GSM/GPRS , public informaiton system, fleet management, maps , central monitoring & control**

## 1. INTRODUCTION:

The effective transportation system leads to the effective movement of goods and people, which significantly contribute to the quality of life in every society. In the Heart of every economic and social development, there is always a transportation system. However rapidly increasing vehicle population in India due to outcome of population boom and economic upturn lays a very highly complex burden on metropolitan traffic management. As the Public Transport has become vital part of urban transportation however most of such mass transit facility are operating with manual method of fleet management and any intelligent technology based tracking & navigation is still not used widely in such public transportation which results in more effort to manage such a large system and dependency manual methods which could be prone to error [1]. If the advanced but easily available wide spread technologies get used then it will not only helps the commuter to get information while travelling but also help the Central controlling authority to track down the fleets with its latest real time location on map to manage it precisely and optimally. The existing widely used & proven technology known as Global Positioning System (GPS) can be used to manage this traffic chaos very intelligently and more economic manner. These systems offer an effective tool for improving the operational efficiency and utilization of vehicles along with Global System for Mobile (GSM) & General Packet Radio Service (GPRS) technology can be used to communicate the real-time location, velocity & time data from moving Bus to central monitoring & control authorities on application like google map or any customized city map. If this application is being used in city bus with

purpose of centralize monitoring & control to enable the authorities or a third party to track the vehicle's location, collecting data in the process from the field and deliver it to the base of operation to track the fleet throughout the city in real-time on city map & it Will also help commuter as navigation aid tool and bus stop information in audio and visual mode.

## II. METHODOLOGY

The overall system is divided in to two sections. The first one is field device and public information system on the bus & second is Central Monitoring & command. The most basic function in all bus tracking & public information system is the vehicle tracking component. This component is usually GPS-based, or a cellular triangulation platform. Once vehicle location, direction and speed are determined from the GPS components, additional tracking capabilities transmit this information to a fleet management software application. Methods for data transmission include both terrestrial and satellite [2][3]. Satellite tracking communications, while more expensive, are critical if vehicle tracking is to work in remote environments without interruption. Users can see actual, real-time locations of their fleet on a map. This is often used to quickly respond on events in the field. In this system we use the GSM/GPRS module for data transmission between central command and moving bus. A passenger information [display] system (PIDS) is an electronic information system which provides real-time passenger information. It may include both predictions about present station, next bus stop, speed etc.

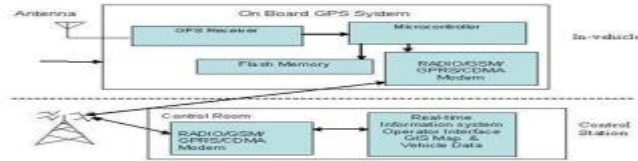


Fig. 1. Typical architecture of GPS tracking System

The Central Monitoring & command center is also having the connectivity by internet or even GSM data can also be directly use for updating the City Map with real-time location data of respective bus. The central monitoring can thus get real-time location and speed data along with journey time. Fig.1 illustrated a typical architecture of GPS tracking system. The location of bus displayed on city map can help commuter to plan the journey accordingly , this information system can be installed on all the bus stops throughout the city & also the authorities can track the journey in terms of time and can make necessary changes for optimal utilization of available fleet resources and maximizing the load handling capacity by effectively planning the routes within the city area & real-time monitor [4].

### III. OPERATIONAL PROCEDURE:

#### A. Operation of unit installed on bus:

Operation of field Device located in bus gets start just after power on. The GPS module starts the scanning of available satellite signals (Ref. Fig.2) A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites high above the Earth. Each satellite continually transmits messages that include the time the message was transmitted satellite position at time of message transmission.

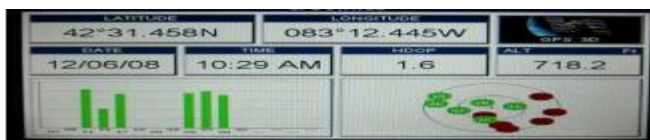


Fig.2. GPS Receiver Display

The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite. These distances along with the satellites' locations are used with the possible aid of trilateration, depending on which algorithm is used, to compute the position of the receiver. This position is then displayed, Perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units show derived information such as direction and speed, calculated from position changes.



Fig.3.On board Display for Passenger Information System

stored co-ordinates of the respective bus stop. If the coordinates matches within the range of stored data. The result is shown as Station Name on LCD display (Ref. Fig 3) and also announcement of that station using speaker. At the same time these co-ordinates send to central monitoring and control using GPS/GPRS module.

#### B. The Central monitoring and control unit:

At the Central Monitoring & Control based on remote site, the real-time data of particular bus is received ether through the internet or GPS/GPRS module. The TCP/IP based web interface can be develop for user interface and thus it can be accessed anywhere. The location information can be shown on map.



Fig.4. Central Monitoring & Control Display

#### . IV. RESULT AND DISCUSSION

The machine-controlled rider system provides commuter the mandatory tools to use the general public transport service and set up ahead their time with the simple to use route data and calculable time of arrival of the general public vehicles. Public Transportation provides screw machine-controlled rider data systems, designed to bring period of time data to transit passengers with access to easy-to-use tools [5]. This tool put in on bus as machine-controlled rider data systems that show the calculable time of arrival and real time vehicle location and next station data. The central watching & management knowledge of real time bus location is additionally accessible to commuter in conjunction with authorities which offer the best & intelligent manner of overall management and tour coming up with of for each. The projected application can for certain offer swish and linear transmission of location data to the bus stations that diode folks to require call either to attend for Bus or not & for aboard riderit'll facilitate to urge station data alert while not dependency on others.

#### V.CONCLUSION

The urban transportation got to get concrete knowledge so as to boost overall fleet productivity. this technique provides ease-of-use for the watching and dominant authorities, fleet drivers and most significantly to commuter. the information from all the bus fleet may be used for time schedule management and optimum coming up

with of route for optimum load capability throughout peak hours this technique therefore decreases the vehicle idle time as its being monitored by authorities by central authorities. The optimally designed routes may edges in fuel usage. The speed of auto may monitor centrally therefore risk of accident are often cut back by limiting speed and watching it just in case of any breach by driver. The record keeping are often created simple as all knowledge is out there digitally and same will directly use for analysis and higher cognitive process purpose for overall improvement of urban transportation this technique conjointly offers liberty to commuter for obtaining traffic route relation data and coming up with for identical. conjointly on board show and announcement of station connected alert in real time facilitate commuter throughout journey until destination. Transportation wherever sizable amount of busses must be manages by authorities and maintenance value may be unbroken low thanks to low value parts& modules on the market in market. this technique may integrated with totally different technologies for extra options and thanks to use of fashionable and wide used technology at cost-efficient worth create it ideal for urban .

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