



## **A Review Paper on College Bus Live Tracking System Using GSM and GPS**

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### **ABSTRACT**

Tracking and monitoring of buses are increasing in urban areas as many commercial and public buses are available large in numbers. Many organizations and individuals find a need for tracking nowadays for safety. Logistics companies need to track buses when precious cargos are carried. Individuals track and monitor their buses a concern for safety. Public transport vehicles are tracked nowadays to provide citizens with transportation details. But in all tracking systems internet and external data servers are used as a basic requirement. This involves investing a large amount of money into the system. So the system developed in this project is mainly aimed at reducing costs in tracking systems and it is to be implemented in college buses which take a specific route on a daily basis.

Keywords: Tracking, Monitoring, bus, GSM module

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### **1. Introduction**

Bus tracking system: GPS is used to locate the location of the vehicle, and a GSM modem with a SIM card is used to facilitate two-way communication. When a user requests the location of the bus, a message is sent to the owner's mobile number via the GSM modem. The system is based on an Arduino platform. A bus tracking system is used to monitor the bus's position and whereabouts. It is situated aboard the bus so that you can use GPS to determine the precise latitude and longitude of the bus. The precise location of the bus can be found on a map by using these latitude and longitude values. Because bus tracking systems are used in so many different systems, they are crucial in today's society. Ensuring the safety of all buses and cars is the main objective of the bus tracking system. These days, modern technology is really helpful; with a GPS system, the owner can keep an eye on and follow his bus. This system's main objective, based on state-of-the-art technology, is to track buses and give consumers real-time location information. The idea used GPS and GSM technology to develop bus tracking, which raises its usefulness and value. This bus tracking system employs a GSM module and a GPS receiver to send data to the specified mobile device. The Bus Tracking System is one of the best technology advancements for tracking bus activity. The Global Positioning System (GPS) is used to locate the tracked or monitored vehicle. The system then uses satellite technology to transmit the coordinates and location information to the user. This allows users to track their bus in real time. Due to its real-time tracking capabilities, bus tracking systems are becoming more and more popular among owners of more expensive tracking systems.

#### **1.1. Structure**

- The position and location of the bus are tracked by the bus tracking system.
- The system makes use of GPS and GSM modem is used for two-way communication.
- Because it is used in so many other systems, the bus tracking system is crucial in today's environment.
- In the modern world, the bus tracking system is essential since it is a component of so many other systems.
- Bus tracking system are growing in popularity among owners of more expensive tracking systems since they offer real time tracking capability.

#### **1.2. Objective**

- The students locate the bus stop and time.

- The college coordinator and the student are notified about the application.
- The application displays the bus's exact timing and location.
- linked to both the college coordinator and the mobile device.

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## 2. Literature Review

Electrical Engineering Department, Inung Wijayanto School, Telkom University Bandung, Indonesia @telkomuniversity.ac.id iwijayanto. The new Bus Rapid Transit system in Bandung, Indonesia is called Trans Metro Bandung. It is a novel kind of transportation that offers affordability, comfort, and safety. Information systems for buses, however, are still insufficient and fall well short of expectations. This includes the unpredictability of bus arrival and departure timings at bus stops. As a result, an integrated web system is created for this study to deliver data, such as the bus's position, arrival time, and passenger count. [1] Inung Wijayanto School, Telkom University Bandung, Indonesia @telkomuniversity.ac.id iwijayanto

N. Khairudin Faculty of Electrical Engineering, University Technology MARA, Shah Alam, 40450, Malaysia; A.A. Aziz, W.R.W. Ahmad. @Salam.uitm.edu.my To assist UiTM students in locating and estimating the arrival time of their preferred bus via a smartphone application, a prototype campus bus tracking system has been built and put into operation. Hardware and software integration is the focus of this project. The GPS module was controlled by an Arduino UNO in order to obtain the geographic coordinates. Using App Inventor, an Android smartphone application is also created so that the user may obtain bus information in addition to knowing when the campus bus will arrive. [2] N. Khairudin, A.A. Aziz, W.R.W. Ahmad

Priyanga P., Manakula Vinayagar Institute of Technology Pondicherry, India; priyanga160699@gmail.com, Department of Information Technology A growing range of technologies is endorsing the sophisticated environment every day. Advanced business procedures are frequently improved by the corresponding advancements in technologies. A number of technologies have been demonstrated in the system to gradually improve people's quality of life and comfort. The newest and fastest-growing technology accessible to all users or users in today's industry is Android. In recent years, there has been a remarkable increase in end-user consent. Based on the most recent GPS technology with IOT, the proposal enables college students to monitor the movement of the college buses, keep track of their schedules, and provide users with real-time bus positions. [3] Priyanga P., Manakula Vinayagar

IoT-Powered Arrival Time Prediction and School Bus Tracking jisha@am.amrita.edu, sajithakumary95@gmail.com, and aiswaryajyothindranath@gmail.com These days, parents worry about their children attending school because there are more and more instances of youngsters missing. Sometimes, students have to wait a lot longer for their school bus to arrive. Certain communication technologies are in use to guarantee student safety. However, these are unable to offer parents effective services. The creation of a school bus monitoring system that can utilize cutting-edge technologies like the Internet of Things (Iota) to deliver useful services is presented in this study. [4] Jisha R.C, Aiswarya Jyothindranath, Sajitha Kumary L

A Bus Tracking System Utilizing Cloud Computing and Internet of Things Technology. Ajayi Adeniyi Binyamin, Nasarawa State University, Keffi, Nasarawa State, Nigeria, Department of Computer Science Although there will soon be technical advancements in public transportation, the bus network architecture and intelligent bus tracking system must be established first. Bus transportation services are at the forefront of the digital revolution; they use smartphones to track information about their services in real time. This study proposes an IoT-based cloud-based bus tracking system to minimize waiting times, energy consumption, and human involvement. A smartphone application can be used to dynamically track the bus's exact location and arrival time, resulting in more effective and efficient bus service. [5] Ajayi Adeniyi Binyamin, Nasarawa, Keffi,

A REAL-TIME SYSTEM FOR BUS TRACKING AND LOCATION UPDATION. The public transit system is essential to many facets of life. It has a bigger effect on the nation's economic growth. This system's main issues include tracking, monitoring, scheduling, and alert services. The majority of this system's functions are now performed manually, making them imprecise and difficult for users to access. The goal of this project is to automate the system's services so that users may track public transportation buses in real time. RFID readers will be installed at each bus stop, and the buses themselves will be equipped with RFID tags. This system is controlled centrally via Arduino. analyzing the information. [6] Ms. A.Deebika Shree, Ms.J.Anusuya, Dr.S.Malathy.

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## 3. Problem Definition

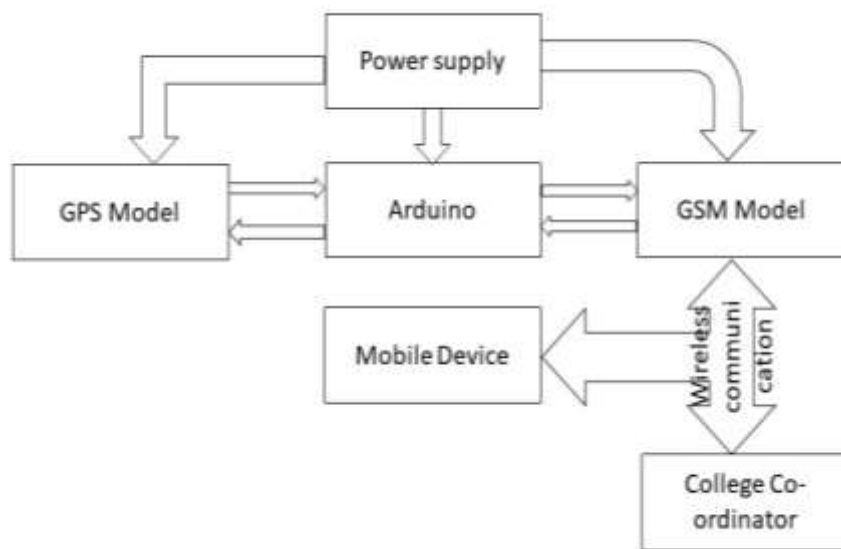
The majority of kids steer clear of taking buses since they don't want to wait for the bus to stop. When waiting for a bus, students get agitated and nervous if they don't know when it will arrive. Students could be wasting valuable time on other tasks instead of waiting for the bus, as a result of this predicament. Some folks wait for the bus, not realizing they are running late for work because they missed the bus previously.

Since most of the institution's students are from rural areas, even in places where state transportation is unavailable, the college has established a college bus service.

#### 4. Methodology

Using the Global Positioning System (GPS) is one of the most popular and dynamic ways to track a case or any effective object. The GPS is still a developing hardware assembly, and no matter where it's used to determine the position of an effective object, the efficiency of the outputs is close to 80% correct due to the growing hardware. The software during this hardware is more improved in the future, and this tool will be used in every field. This GPS tool obtains data for more than two satellites and provides us with the position of the traveling object we are looking for in our case. It drives information once the bus reaches the GPS is used to track the present bus situation and relay information to the server, which is authorized by the employer to track the positions and specifics of their conveyer. All in all, this verifies the data that it gathers and uploads to the scheme's server, which the application successfully uses. The capabilities of the existing tracking system, which includes determining the bus's location, arrival time, and departure time, are proposed on a map through integration with the Google Maps API.

#### 5. Block Diagram



#### 6. Components Requirement

##### 6.1. Arduino Uno

Hardware and software that are easy to use form the foundation of Arduino, an open-source electronics platform. Arduino boards are capable of receiving inputs, such as a sensor's light, a finger pushing a button, or a message from Twitter, and converting them into outputs, like an LED turning on, a motor starting, or an internet post. The Arduino Uno microcontroller board is based on a detachable, dual line-package (DIP) ATmega328 AVR microprocessor. Six of the twenty digital input/output pins are analog inputs, and the remaining six are PWM outputs. The easily navigable Arduino computer programme can be used to program it. The Arduino is a reasonably straightforward platform on which to start working with embedded systems because of its extensive support network.



Fig (1). Arduino Uno

### 6.2. GSM Module

For digital cellular communication, the Global System for Mobile Communication, or GSM, is a generally recognized standard. The purpose of the establishment of the GSM standardization committee in 1982 was to create a common European mobile telephone standard that would outline the requirements for a pan-European mobile cellular radio system operating at 900MHz.



Fig. (2). GSM Module

### 6.3. GPS Module

The Global Positioning System, or GPS for short, is a space-based radio navigation system that provides extremely precise navigational signals to users on or near Earth. Every twelve hours, 24 primary satellites in six orbits orbit the Earth as part of the US Navistar GPS system. Furthermore, the Global Navigation Satellite System (GLOASS) is a constellation that is maintained by Russia.



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## 7. Benefits

- To find out where the driver is, we don't need to call them. With this system, we are able to follow the path.
- The system is the most dependable, quickest, and easiest.
- The system is easy to use.
- The System is reasonably priced.
- One can access the bus's whereabouts in real time.

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## 8. Conclusion

Utilizing GPS receivers and a GSM modem, the project "Bus tracking and SMS alert system using GSM and GPS" serves as a model for a bus tracking device. For private use, bus tracking enhances security and safety, facilitates communication, tracks performance, and boosts output. It will therefore be very important to our daily lives in the upcoming year.

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## 9. References

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