

# COLLEGE BUS TRACKING AND NOTIFICATION SYSTEM

Athira Unnikrishnan<sup>1</sup>, Amal Babu K<sup>2</sup>, Gopika Raju<sup>3</sup>, Neeraja P.K<sup>4</sup>, Merin Sara George<sup>5</sup>

<sup>1,2,3,4</sup>Student, Dept. of Electronics and Communication Engineering, MACE, Kerala, India

<sup>5</sup>Assistant Professor, Dept. of Electronics and Communication Engineering, MACE, Kerala, India

\*\*\*

**Abstract** - In today's economic and traffic condition no one can predicts at what time and when the required transportation of a person can arrive. The aim of the paper work is to provide an app which can be used for college students so that they can manage the time during all days usefully and get to their transport point at the right time and not lose the bus or any other college transportation receive provided by the college. We intent to use IOT and concepts with the help of NodeMCU to complete and implement this product. This paper also aims to add features like estimate time of arrival, notification, students data base etc.

**Key Words:** NodeMCU, Economic and Traffic, College Students.

## 1. INTRODUCTION

In the growing and evolving environment the time is so precious that if you lose some it may cause you major incident like during exam days for school or college students that may miss their bus are their time for last minute revision they need to do before the exam. For such issues I have developed this paper.

Vehicle Tracking System (VTS) is the technology used to determine the location of a vehicle using GPS and other radio navigation systems operating through satellites and ground based stations. The proposed system deals with obtaining bus timings, bus numbers, routes through which buses pass, current location of the bus, time taken by a bus to reach the stop, sending notifications to concerned authorities in case of an emergency and to update changes in the bus schedule through an android application for our college buses. This system overcomes the problems faced today like inability to share changes in bus schedule to students and staff, long waiting in bus stops and calls to the bus head to know bus location.

## 2. COMPONENTS USED

### 2.1 GPS Tracker

The one which is used NEO 7m GPS tracker. This tracks the bus continuously and report it to the application by using the parameters such as speed, geographic location and the route and upload it to the server and is viewed through the mobile application.



### 2.2 NodeMCU

It is an open source IOT Platform. It includes ESP 8266 Wifi SoC. It operates at 3.3V. It connects the data from GPS to database via internet.



### 2.3 Vibration Sensor

This module features an adjustable potentiometer, a vibration sensor, and a LM393 comparator chip to give an adjustable digital output based on the amount of vibration. When the output of digital sensor is 1, notifications are sent to the bus administrator.



## 3. SOFTWARE IMPLEMENTATION

In this prototype, the application was built with the help of java, xml and embedded c coding with is done in android studio environment to develop the mobile application. The

tracking device coding was done with the help of Arduino IDE and was combined with the application in the android studio respectively. The backend were developed using java My SQL, java script. The database is used for the storage of the student data.

#### 4. PROPOSED SYSTEM

The proposed design conceptualizes a comprehensive monitoring system which would track the bus continuously in real time.

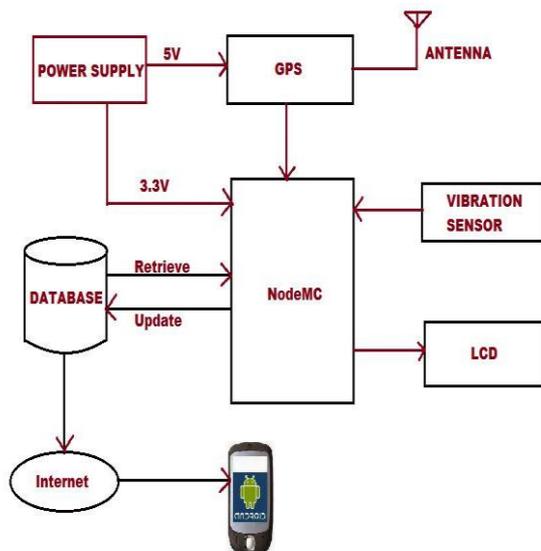


Fig -1:. Block Diagram

The functionalities of the proposed model includes tracking the location, the list of passengers which should be onboard and the route of the bus and plotting these information on a map integrate dosing the Google Maps API. The user interface is an android application which serves as the tool to locate the bus, to estimate its time of arrival and notifies the required student and staff accordingly. The application will send you the notification when there are changes in the bus schedules or bus route(we need to take on a circumstance bases). Figure 1 shows the overall block diagram and the flow of the system. The hardware assembly is kept at the entrance of the college bus. A vibrational sensor module is also attached to the system that notifies the bus administrators when the bus meets an emergency. Also an LCD display is attached to display the current location of the bus. The GPS system is used to track the real time bus location and send the information to the server accordingly which is then used by the application to track their transports locations and details.

Initially GPS antenna receives the signal (active antenna amplifies the signal a bit) and sends it down the line to the receiver. GPS Module provides geolocation (Latitude and Longitude) to NodeMCU. This is then passed to NodeMCU module. It includes an ESP 8266 Wifi SoC. Over the internet

these latitudes and longitudes are continuously uploaded to the database. The server will find the location using those coordinates and uploads it into database. Now the location is retrieved back to NodeMCU. The LCD is interfaced to NodeMCU using I<sup>2</sup>C bus. The location is then displayed in the LCD. The uploaded data is used for live tracking by the application. The mobile application for the model works on the Android operating system.

Our application is named “Track My Bus”. Track My Bus enables two types of log in. One for the users with only view field. The other that is, the administrator can edit the bus details and can send broadcast message to all the users. The log in facilities will provide security to the details of bus. On signing up, the unique ID will be generated( for the future verification). The students then will have to use the same password with their roll no to login. A Google Map API is integrated to the application UI to plot the location and route of the bus. In the students login the students can view the bus details and the drive details. The application also show us the location, time of arrival, changes in the bus schedule and so on. The route can vary according to road and climate condition which will also be shown in the student login. In the administrator login we can see the time of arrival of the bus, the route, no of students which should be on board and the driver details.

#### 5. ADVANTAGES

The advantages of the system are as mentioned below:

- Since we can track the bus activity it makes us to converse more time and work efficiently.
- With the help of ETA we can get ready correctly on the days when we get up late and miss the timing we normally get ready.
- If we miss the bus in our stop we can check for the nearby bus station and its timing to arrive there accordingly.
- Notifies the concerned authority when the bus meets any danger.

#### 6. DISADVANTAGES

The following points are the disadvantages:

- The accuracy of the device is still be tested and it may cause problem accordingly to the service and device maintenance.
- The algorithm may cause change to the ETA on bases of bad climatic condition and other unavoidable road conditions.
- The route mentioned in the map may not be accurate accordingly to the road and bad climatic conditions.

## 7. FUTURE SCOPE

The proposed system can be extended from Android application to Hybrid application for both Android as well as IOS users. It can be further improved to find the total available seats before hand. It can also be extended to college canteen, library, Photostat centre in the near future for ease of access. The project will be put up on a cloud platform, so that it will be accessible by every Android user. The application will prove beneficial to every bus traveller or even tourists. Not just buses but this application will be useful for every person travelling by any means of transport. The Location Tracker will give exact location of the bus which will make it easy for the passengers to travel. It can be extended to any institutions, industries, companies to know the current status of the buses.

## 8. CONCLUSION

The proposed system is successfully designed and tested and the following conclusions are made. It enables the user to catch the bus on time, provides an alternate bus and the shortest route till the bus. Also keeping track of the number of students registered and the current location of the bus at regular time intervals. It is better in terms of other applications, it enables the driver to select which bus he is driving, the technique used is unique. This application can be used in transport system of any institutions, industries, companies to know the current status of the buses. It can also be used to keep track of number of students and faculty registered and travelling by bus.

## REFERENCES

- [1] Swati and Sneha Mugade "Real Time Bus Position and Time Monitoring System" IJSTE- International Journal of Science Technology Engineering, Volume 1, Issue 10, April 2015.
- [2] M. B. M. Kamel, "Real-time GPS/GPRS based vehicle tracking system," International Journal Of Engineering And Computer Science, Aug.2015".
- [3] "Real Time Availability System" International Journal of Advanced Research in Computer Engineering Technology (IJARCET) Volume 4 Issue 3, March 2015.
- [4] Manash Pratim Gohain, Speed Governors, GPS must for school buses, The Times of India, February 24, 2017
- [5] Pham Hoang Oat, Micheal Driberg and Nguyen Chi Cuong, Development of Vehicle Tracking System using GPS and GSM Modem , 2013 IEEE Conference on Open Systems (ICOS), December 2 - 4, 2013, Sarawak, Malaysia.