



## RESEARCH ARTICLE

### INTELLIGENT TRANSPORT SYSTEM FOR SMART CITIES

\*Gayathri, T., Aarthy, S., Abirami, A., Ajmalkhan, A. and Monisha, R.

Department of E.C.E, SNS College of Engineering, Coimbatore, India

#### ARTICLE INFO

##### Article History:

Received 27<sup>th</sup> November, 2017  
Received in revised form  
20<sup>th</sup> December, 2017  
Accepted 22<sup>nd</sup> January, 2018  
Published online 28<sup>th</sup> February, 2018

##### Key words:

LoRa, GPS, Cloud Server,  
Speed Sensor, Mobile.

#### ABSTRACT

The epidemic growth of wireless technology and mobile services in this era is creating a great crash on our life style. Some early efforts have been taken to utilize these technologies in surveillance. The purpose of this project is to build a intelligent transport system using LoRa, GPS, Movable sensor and cloud computing. LoRa is a advanced protocol used to transmit data to the cloud server. This technology will enable public or multi-tenant networks to connect a number of applications running on the same network. It can track buses in city by placing LoRa in the buses along with GPS, and speed sensor. The cloud server for the city receive the location information, and alerts the forth coming bus stops in the route of the bus, of the bus' number, route and expected time of arrival, which are displayed in mobile application. This system thus describes is a cost effective and easy to implement for tracking buses in real time by using IOT.

*Copyright © 2018, Gayathri et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.*

**Citation:** Gayathri, T., Aarthy, S., Abirami, A., Ajmalkhan, A. and Monisha, R. 2018. "Intelligent transport system for smart cities", *International Journal of Current Research*, 10, (02), 65410-65412.

## INTRODUCTION

Now-a-days, due to growing world & importance of the time in day to day life there is need of effortless transport. 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. As we know the lots of work is done previously on this system to provide the user what they need & is to solve the various challenges. So to reduce the extra efforts to track the object and also to improve the previous demerits, we are developing intelligent transport system based tracking. LoRa is a wireless technology that facilitate low data rate communications over long distances 15 - 20km and its range is Millions of nodes. Long battery life upto ten years for M2M and IoT Application. GPS is a satellite navigation system that defined location and time information in all type of weather conditions to the user. GPS is used for navigation in planes, ships, cars and trucks also. The cloud computing will include the authorization and authentication with data storage & application processing. With the help of smart phone the people will get facilitate with travelling which is more secure. So, all in one this application will be very useful and convenient application for people in day-to-day life.

## Existing system

Now-a-days the bus spread adopted in main transport method. It reduce the fuel consumption of vehicle and also for passengers. The bus arrival is totally depend upon whether condition, traffic and time punctuality of driver and public. The public have to wait for bus for long time or sometime miss bus also. This will be embarrassing for students who spend time and wait for long period. Hear buses are comes with technologies support like GPS enabled tracking system, smart on board units, maps and smart vehicle solutions. GPS tracking system is easy to implement in real time. It direct gives our vehicles details like latitude and longitude combined as same location on earth. These are co-ordinates are sent users mobile by SMS or web server. The use of GPS is increases the price of hardware and even in energy consumption of GPS. GPS also have drawback it placed towards the satellite. They are not accurate system. And small tracking system are available in the market. It increase the cost when additional features are added. So, existing system have ability to help the self user to track its bus. But not for multiple users like public waiting for bus. and it is not predict the arrival of bus at nearest point. In order to obtain the information about instant position of the public transport vehicles, a GPS module containing a SiRFstar3 GPS chip was used in an integrated manner with the mini-computer systems embedded in the public transport vehicles. The GPS module was connected to the embedded mini-computer system through TTL and RS232 data-buses. RS232 transmission speed was determined as 4800 bauds. The instant positioning information of the public transportation vehicles was obtained

\*Corresponding author: Gayathri, T.,

Department of E.C.E, SNS College of Engineering, Coimbatore, India.

through this in the standard of National Marine Electronics Association 0183 (NMEA)integrated use of the embedded mini-computer system and the GPS module, the developed application obtains the instant positions of the public transportation vehicles, their altitudes from the sea level, their speed and time info (hour and date in UTC form) which was synchronized by the software. This existing system gives information about vehicle position and route travelled by vehicle and this information can be monitor from any remote place or location. This system depends on GPS and GSM technology. And also there is no application depending on mobile device to track and get a real time and current view of target or vehicle. This suggested system helps to getting information and location of college bus by using mobile or smart phone. But we got some lagging points in this system, there is only provision for tracking & this tracking is based only on SMS. There is no real time view of location for bus and also there is no any application based on mobile for tracking The above mentioned paper includes the integrated use of the smart cards with GPS system. In today’s world smart cards became mostly used things which contains the user’s data and GPS used in many areas like tracking and monitoring or surveillance which is used in this system for finding the actual distance traveled by that passenger.

**Proposed method**

**A. Introduction**

The Proposed System Consists Of Lora, GPS, Speed sensor. These devices which are mounted on the bus. In this system user can detect the bus arrival with the help of mobile application. It displays bus number, approximate time arrival, speed. If any break down occurs, application will notify it. Lora send data to the cloud server about buss arrival around 15km from the user location

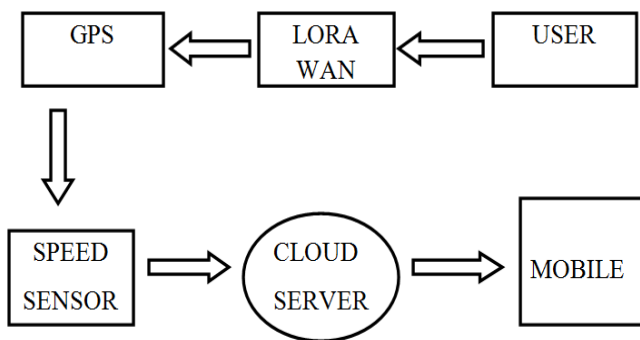


Figure 1. Block Diagram for transport tracking System

When our application starts running it first check all the devices and resources which is available or not. After that it checks the connection with their devices and gives control to the user.

**Hardware implementation**

**A. Lora Board**

**LoRa:** Long range, low power wireless well-known technology choice for building IOT networks world wide. Smart IOT applications improved the way we interrelate and are addressing some of the biggest challenges facing cities and communities: climate change, pollution control, early counsel of natural disasters, and saving lives. Businesses are benefit

too, through improvements in operations and efficiencies as well as drop in costs. This wireless RF technology is being included into cars, street lights, manufacturing equipment, home appliances, wearable devices – anything, really. LoRa Technology is making world a Smarter



Figure 2. LoRa board

**LoRa Technology**

A Semitic innovation, LORA Technology offer a very convincing mix of long range, low power consumption and secure data transmission. Public and private networks using this technology can provide exposure that is greater in range compared to that of existing cellular networks. It is easy to plug into the live infrastructure and offers solution to serve battery BASED ONIOT applications. LORA Technology into its chipsets. These chipsets are then built into the products offered by our enormous network of IoT partners and integrated into LPWANs from mobile network operators worldwide.



Figure 3. Working of lora

**B. Global Positioning System**

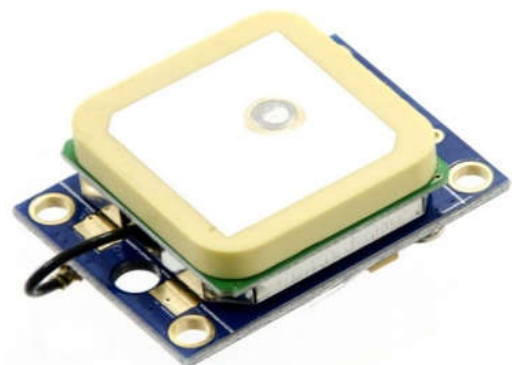


Figure 4. Global Positioning System

The concept of GPS is a radio based satellite positioning system. Radio signals emitted from transmitter are used to determine the position of the receiver. The positioning system consists of 3 spare satellites and 21 satellites orbiting at the period of 12 hours and at the height approximately 20,000 km above the earth's surface in six orbital planes. GPS positioning system providing 24 hour world-wide coverage with the help of at least four satellites. GPS consists of three main components namely the control system, the satellite system, and the users (client). The system consists of monitoring stations which perform the role of monitoring the condition of satellites. These tracking stations receives and transmits the signals and collect data to the server station where new ephemerides are computed.

### C. Speed sensor

Wheel speed sensors are machines used to detect the speed of an object, usually a transport vehicle.

### Software Implementation

The open-source Arduino Software (IDE-Integrated Development Environment) is used and makes it easy to write code and upload it to the board. Arduino can interact with buttons, LEDs, motors, speakers, GPS units, the internet, and even your smart-phone. The IDE is written in Java and based on Processing and other open-source software. A program for Arduino may be written in any programming language with compilers that produce binary machine code for the target processor. Arduino consists of both a physical programmable circuit board and a piece of software that runs on your computer, used to write and upload computer code to the physical board. The Arduino does not require a separate piece of hardware to load new code onto the board, you can use a USB cable. Moreover, the Arduino IDE uses a C++ programming, making it easier to learn to program. Arduino provides a paradigm form factor that breaks out the functions of the micro-controller into a more accessible package.

## RESULTS

When the busses arrive into the particular location, LORA will send data to the cloud server then it save the data in the server and send the data to the user application. application will display the bus location with the help of GPS, bus number, approximate arrival time to the user. To define the occurrence of breakdown, wheel speed sensor is used hear.

Bus no	45c
Bus stop	Gandhipuram
Arrival time	5min

### Conclusion

The design system provides a flexible, convenient and easy to migrate one place to other place using this android application. It save the passengers valuable time. It will be easy and much comfortable to any kind of places. This system make sure that good quality of service.

### Future Enhancement

In future, the project can be improves as a wide location and different areas for tracking the bus by using gps, we can directly

have a communication with the bus. Also by connecting a Raspberry pi instead of arduino for getting for more information about the intruders entry. So there is no need for continuous monitoring of human.

## REFERENCES

- Ajay Shingare, Ankita Pendole and Prof.Samadhansonavane, "GPS Supported City Bus Tracking and Smart Ticketing System", International Conference On Green Computing and Internet of Things (ICGCoT).
- Pengfei zhou and Yuanqing zheng, "How long To Wait?Predicting Bus Arrival Time With Mobile Phone Based Participatory Sensing",//www.ieee.org/publications-standards.
- Qassim Bani Hani and Julius P. Ditcher, "Mobile-Based Location Tracking Without Internet Connectivity Using Cloud Computing Environment", International Conference On Mobile Cloud Computing, Services and Engineering.
- Pradeep Kumar, N. and Ravi kumar Jatoth, "Development Of Cloud Based Llight Intensity Monitoring System Using Rraspberry P",978-1-4799-7165/\$31.00@IEEE.
- Nalawade S.R and Devrukhkar Akshay S, "BusTracking By Computing Cell Tower Information On Raspberry Pi", International Conference On Global Trends In Signal Processing, Information Computing and Communication.
- Qiang Zhang, Yanchu Zhang and Jingyi Li, "Easy Come Easy Go:Predicting Bus Arrival Time With Smart Phone". Ninth International Conference On Frontier Of Computer Science and Technology.
- Cemil Sungur and Ismail Babaoglu, "Smart Bus station Passenger Information System", Second International Conference On Information Science and Control Engineering.
- Lin Kang, Stefan Poslad, Weidong Wang and Xiuhuali, "A Public Transport Bus As A Flexible Mobile Smart Environment Sensing Platform for IOT", Second International Conference On Intelligent Environments.
- Maria Anu, Sarikha. D, Sai keerthy, G. and Jabez, J. "An RFID Based System for Bus Location Tracking and Display",978-1-4-799-8788-7/15/\$31.00/24@2015 IEEE.
- Dr. Subash Chandra bose, J., Dr. Marzouguri mehrez, Dr. Ahmed said bawdy, Dr. Wade ghribi, Harun bangali, Asif Basha, Development and Desiging of Fire Figher Robotics Using Cyper Security, 978-1-5090-3/17/\$2017 IEEE.
- Thatsanee Charoenporn, Peerasak Pianprasit, Aekapop Bunpeng, Thamrong Sunate, Sarin Kesphanich and Athita On-uean, "Selection Model for Communication Performance of the Bus Tracking System", 978-1-4673-8139-0/16/\$31.00©2016 IEEE.
- Safa Abd elmonem, Yosif, Murtada Mohamed Abdelwahab and Mohamed Abd Elrahman ALagab, "Design of Bus Tracking and Fuel Monitoring System", Computing and Electronics Engineering (ICCCCEE).
- Muhammad Nur Zaki Juhari and Hasmah Mansor, "IIUM Bus On Campus Monitoring System", 2016 International Conference on Computer & Communication Engineering.
- Jay Lohokare, Reshul Dani, Sumedh Sontakke and Rahul Adha, "Scalable Tracking System for Public Buses using IoT Techologies", 2017 International Conference on Emerging Trends & Innovation in ICT (ICEI).
- Kuan Yew Tan, and Kok Sheik Wong, "Low-Cost Campus Bus Tracker using WiFi Access Points", 2016 International Conference on Consumer Electronics-Taiwan.