



# Smart Digital Indicator Bus Stop

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## Abstract:

Development of a smart bus stop that displays the time of the upcoming and missed buses. This system will have a display screen to erect on the bus stop to show information related to the buses. The display will also have information on the buses that have recently come and the buses that have departed from the bus stop. This will help the passenger to manage his time according to the schedule.

**Keywords:** Smart Digital Indicator Bus Stop, Indicator displaying arrival and missed buses, Bus Indicator, Indicator for arrival and missed buses, Public Bus Transport indicator.

## I. INTRODUCTION

Public transportation systems play an increasingly important role in the way people move around their communities. Most people reach from homes to workplace or school using public transportation. It is a very cost effective mode of transport. Due to this public transportation system has become a part of peoples' life. Most people reach from homes to workplace or school using public transportation. Due to reasons such as heavy traffic and roadwork etc., most of the buses are delayed in time. People have to wait for a long time in the bus stop without even knowing when the bus will arrive. Anyone who wants to use the public transportation system can find the time of arrival of a particular bus at the particular destination even at their homes and plan their departure from home accordingly. But the bus arrival time cannot be guaranteed due to unexpected delays in traffic congestion. Also, people have the right to know where the bus is now and how long time it takes bus to reach bus stop. The services provided to passengers by transport systems are very important.

**There are two kinds of service that all transport systems must provide:**

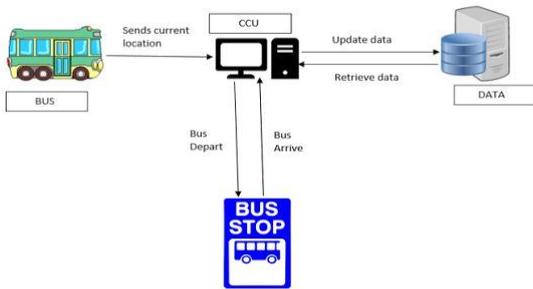
(i) route and schedule information (maps, schedules, and information on connections) (ii) basic information (fare policy, stop locations, etc.). Nearly all transport systems now provide service information on their websites where users can either view it electronically or print it at home or in their office. Real-time vehicle tracking and management system has been the focus of many researchers, and several studies have been done in this area. There are many ways in which we can use GPS devices to track the location of any particular vehicle. The most popular method has been to combine the use of a GPS device with Automatic Vehicle location algorithm to track a vehicle. The main objective and focus of this project are to provide the user with such a system which will reduce waiting time for the bus and will provide him with all necessary details regarding the arrival time of the bus and expected waiting time. For the best tracking result, an embedded GPS system in the bus will send the data to a centralized server. This information is then transmitted to each of the bus stops, in a meaningful way so the user can manage his time.

## II. PROPOSED SYSTEM:

The proposed system consists of the following components The Global Positioning System (GPS) is a space-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil, and commercial users around the world. Automatic vehicle location (AVL) is a means for automatically determining and transmitting the geographic location of a vehicle. This data, from one or more vehicles, may then be collected by a vehicle tracking system for a picture of vehicle travel. The location is determined using GPS, and the transmission mechanism is SMS, GPRS, a satellite or terrestrial radio from the vehicle to a radio receiver. GSM and EVDO are the most common services applied, because of the low data rate needed for AVL, and the low cost and near ubiquitous nature of these public networks. The low bandwidth requirements also allow for satellite technology to receive telemetry data at a moderately higher cost, but across a global coverage area and into very remote locations not covered well by terrestrial radio or public carriers. GSM (Global System for Mobile Communications), is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones, first deployed in Finland in July 1991. As of 2014, it has become the default global standard for mobile communications - with over 90% market share, operating in over 219 countries and territories. GSM uses the GPRS system to send data to the Central Computing Unit. General Packet Radio Service (GPRS) is a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM). Central computing Unit is a system that is used in Centralized computing. Centralized computing is a type of computing architecture where all or most of the processing/computing is performed on a central server. Centralized computing enables the deployment of all of a central server's computing resources, administration, and management. The central server, in turn, is responsible for delivering application logic, processing and providing computing resources (both basic and complex) to the attached client machines.

### III. SYSTEM ARCHITECTURE

A GPS system is fitted into the bus; this system will track the information on where exactly the bus is at all times. The system will include a unique identifier for each bus so that we can differentiate between different buses. The information received from the GPS system is then relayed to the centralized server usually by located in the main bus depot. Information to the server can be sent at regular intervals. This information will include GPS coordinates, timestamps, and the unique identifier. This information can be compared to the previous data obtained from the same identifier and the speed of the bus can be calculated by this information the information sent can be uploaded by means of a GSM chip. GSM chips are also used in mobile phones and are widespread so the coverage received is very good. It is a cost effective way of sending information across the internet. This GPS system requires a power source which can be a miniaturized solar panel which can be installed on the top of the bus. This solar panel can be attached to a battery for the GPS. This will ensure that the system will work seamlessly in the night when there is no solar power available. Although this source can have enough power to power the system, for backup measure an additional power can be sourced from the battery of the bus.



The centralized server can be located in the main bus depot. The information can be sent from the bus to the server. The server can distribute the data to all the relevant bus stops. This server having high processing capacity can also calculate the time required for the bus to reach the bus stop. This calculation can be based on the current speed of the bus and location. This information can be then sent to the bus stop display using the same GSM technology. Bus display will also have a GSM chip so that it will get data from the server. The display will include information of the list of all the buses served by the bus stop. The alongside the list information such as the number of stops that have already passed and time passed since the last bus arrived and as well as the number of the stops & time required for the next bus to come.

Missed	Bus no	Arriving
3	357 Shivaji Nagar Depot to Mumbai central depot	1
4	11 Worli Depot to Andheri Station.	2
1	505 Wadala Depot to Vashi Railway Station	1
7	350 Kurla Station to Shivaji Nagar Depot	5
5	488 Ghansoli Station to Dahisar Bridge	3
3	404 GHatkopar Station To Kurla Depot	2

The bus stop display will contain the list of upcoming buses along with the number of stops far the bus is from the stop. Alongside the list the display will also contain the number of

stops ahead the last bus has passed. This can be use full if the last bus has not passed too far away.

### IV. CONCLUSION

This system is made so that people can manage their schedule according to the bus schedule. The system keeps tracks every bus so that you can know the exact location of the bus at a particular time. So by using this application user can just wait or they may reschedule their journey according to bus availability. This system presents a way in which people can save a lot of time. So this paper presents a system which provides high practical value in the modern fast era this system uses low-cost components and is very cost effective. The energy used for this system is also sustainable. So no additional power cost is involved.

### V. REFERENCES

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