Bus Pile Up Avoidance System And Bus Frequency Optimizer

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Abstract- *Intelligent public transport is another slant towards transportation which is been emerging in different urban communities, the principle goal of this framework is to upgrade productivity and nature of the framework that will bring up in utilization of framework and more individuals will be pulled in to open transport. New highlights and choices are included to the IPTS in future. Transport Frequency enhancement should be possible if transport heap up or transport grouping is limited or evacuated, in this paper remote strategy, convention and frameworks are portrayed and executed to enhance transport recurrence and stay away from transport heap.Transport heap up shirking framework is been executed with the guide of remote correspondence. Three layer conventions will be produced for remote correspondence, and less evaluated RF handset will be utilized to assemble interchanges and message passing and sending mandates to Bus drivers. Landing time and break time of each transport will be kept up in line and the time will be programmable. Three unique methods of transport activity will be advanced: 1) Normal mode 2) Slow Mode 3) Freeze mode. Modes will be consequently decided and passed on to Bus driver board through our wireless communication packet. Plan can be made to log a complaint against driver automatically to central controller officer automatically via stand to stand wireless communication for which a separate frequency is required and protocol packets will be improved. We describe this system as bus pile up avoidance system.*

Keywords- BPAS - bus pile up avoidance system; IPTS - intelligent public transport system.

I. INTRODUCTION

Intelligent public transport is new slant towards transportation which is been appearing in different urban areas, the primary target of this framework is to upgrade productivity and nature of the framework that will bring up in utilization of framework and more individuals will be pulled in to public transport.

This framework contributes bus entry time to the clients yet in some framework it additionally directs every one of the busses of all courses and changes the course number of bus on courses consequently according to necessity. New highlights and choices are included to the intelligent public transport framework (IPTS) in future.

With the guide of remote correspondence an ITPS can be outlined, numerous pioneers have added different highlights to enhance transport going from course advancement to GIS based upgrades. This paper is around one of the highlights to maintain a strategic distance from transport heap up with the outline of restrictive system convention and framework.

Bus pile up is a situation when buses with same route number travel almost next to each other and end up arriving at the bus stand at the same time.It is frequently observed that more than 2 buses having the same route number arrive at the bus stop at almost together or with a delay of 2-3 minutes.

The heap ups are generally happened because of different conditions like roads turned parking lots, changing activity densities, diverse driving conduct of drivers, railroad crossing in the transport course and so forth.

Drivers can't be made in charge of this as should be obvious the bus course number plate and attempt to keep away from heap up. Particularly when the busses are 2-3 minutes from each other they can't see the bus itself.

Due to the bus heap travelers are enduring as well as the transportation office likewise acquires misfortune in ridership, and utilization of the transport by the normal man. They lose client and salary.

To counteract heap up the drivers ought to keep up adequate space among their busses of same number bus this isn't unfathomable so we have to advance a piece of inserted gadgets framework which will profit in staying away from heap ups.

This can be expert in two ways either bus can interface with each other and keep up separations or stand can tell the busses to stop or go moderate so separations can be kept up.

We have experienced existing IPTS framework and without much abundance work and cost we can execute our element in which stands will inform the busses and the separation will be kept up.

As the bus and stand are already set up in IPTS with some wireless device we can cast a BPAS service in that wireless communication network and get the feature working.

Fig 1 shows the setup of bus pile up avoidance system.

Bus Pile up Avoidance system is basically a wireless communication project with multiple wireless nodes, for this project we need to design a wireless network consists of N nodes of 3 types i.e. Bus Node (Fig 2), Stand Node (Fig 3) and Depot Node (Fig 4). We also have to design protocol which is suites to our project hence we develop a packet protocol system. We are not designing RF transmitter receiver we are designing a wireless network using RF modules. Our scope is limited to design of wireless network using 2.4 GHz CC2500 based t1ransceiver module and suitable protocol for it. This was one part of project then we develop I2C driver for EEPROM and RTC interfacing on BUS so that bus is capable of storing all events for data analysis and driver complaints.

In stand part we are developing or main bus pile up avoidance algorithm using queuing algorithm we make bus arrival-departure queue and when a bus arrives we find the bus pile up situation and send driver instruction command to bus to avoid pileup. In depot we just do communication and packet formatting i.e. conversion of packets into human readable form and transmitting to PC, at PC any terminal program can be used to display this data but actually it has to be displayed plus it has to store in some oracle or SQL database for data mining and data analysis. As per stand instruction bus displays the driver what speed he has to go or he has to stop for a while to avoid pile up, we are not interacting with bus engine or we are not directly monitoring bus speed.

Only we instruct to driver using audio visual indicators. And we log the event in EEPROM with time. Next stand decides whether driver has followed instruction of previous stand and based on that warning may be issued if driver had not followed the instruction of previous stand. This warning is stored in EEPROM and at depot when complete log is downloaded if depot in-charge finds multiple warnings then he can issue a memo to corresponding driver.

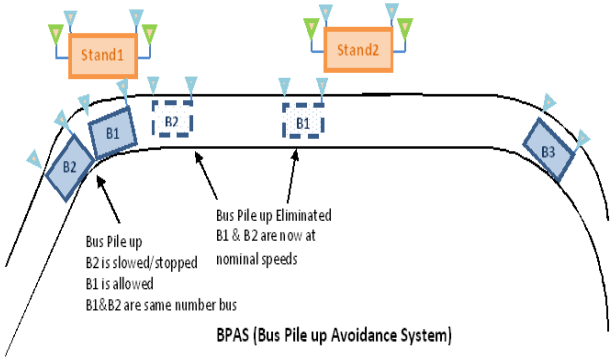

Fig.1 BUS PILE UP AVOIDANCE SYSTEM

II. METHODOLOGY

The principle controller creates the correspondence of the approaching transports with the assistance of correspondence controller, and once the transport is recognized, the data is sent to the fundamental controller. The principle controller forms the data on the show lastly takes ideal choice for staying away from transport heap ups.

The communication controller continuously looks for the bus and passes bus information to the main controller.

It has implementation of all low level RF communication drivers. Zigbee, ISM, 802.15.4, ASK, FSK etc. or any RF communication and its drivers can be used by communication controller.

Arrival and takeoff time of each bus will be kept up in line and the time will be programmable.

A convention will be produced for remote correspondence reason, and a low evaluated RF handset will be utilized to fabricate interchanges and message passing and sending orders to Bus drivers.

Three unique methods of bus activity will be promoted: 1) Normal mode 2) Slow Mode 3) Freeze mode.

Modes will be subsequently chosen and passed on to Bus driver board through our remote correspondence parcel. Plan can be made to log a protestation against driver consequently to focal controller officer naturally through remain to stand remote correspondence for which a different recurrence is required and convention bundles will be moved forward.

Bus can store all the events in its EEPROM with time these can downloaded to Bus Depot at the end of the day for performance analysis.

III. IMPLEMENTATION

The main element of this project is to establish a RF communication system which can be passed down to recognize the BUS and then take decision to avoid piles up.
The principle controller creates the correspondence of the approaching transports with the assistance of correspondence controller, and once the transport is recognized, the data is sent to the fundamental controller. The principle controller forms the data on the show lastly takes ideal choice for staying away from transport heap ups.

The communication controller has the maximum work time in the system it continuously looks for the bus and passes bus info to the main controller; it has implementation of all low level RF communication drivers. Zigbee, 802.15.4, ASK, FSK etc. any RF communication and its drivers can be used by communication controller.

Go, Go Slow and Stop are the indicators for the drivers, implemented to guide them for pile up free transportation system.

Display is for internal process examination, debugging and process flow inspecting purpose. A low priced 16X2 LCD is used for it.

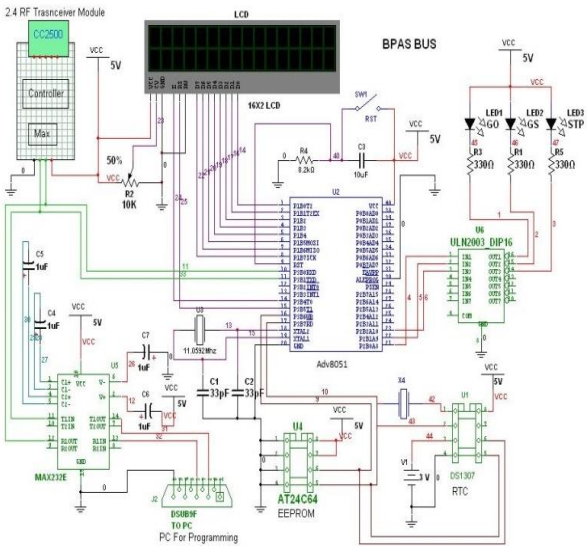

Fig.2 ARCHITECTURE OF BUS

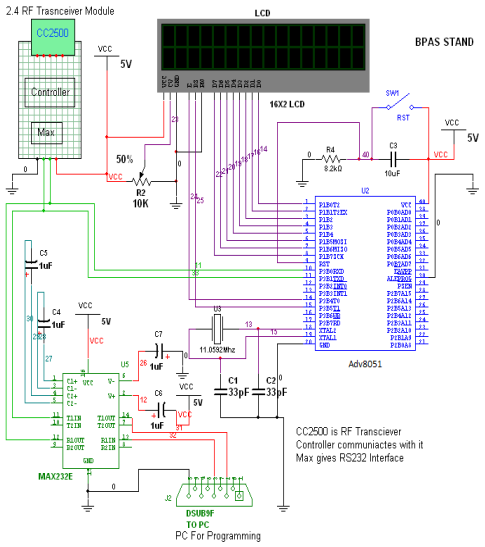

Fig.3 ARCHITECTURE OF STAND

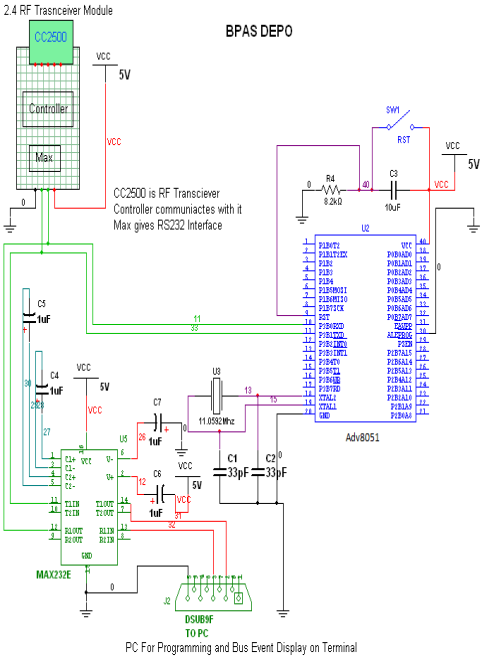

Fig.4 ARCHITECTURE OF BUS DEPOT

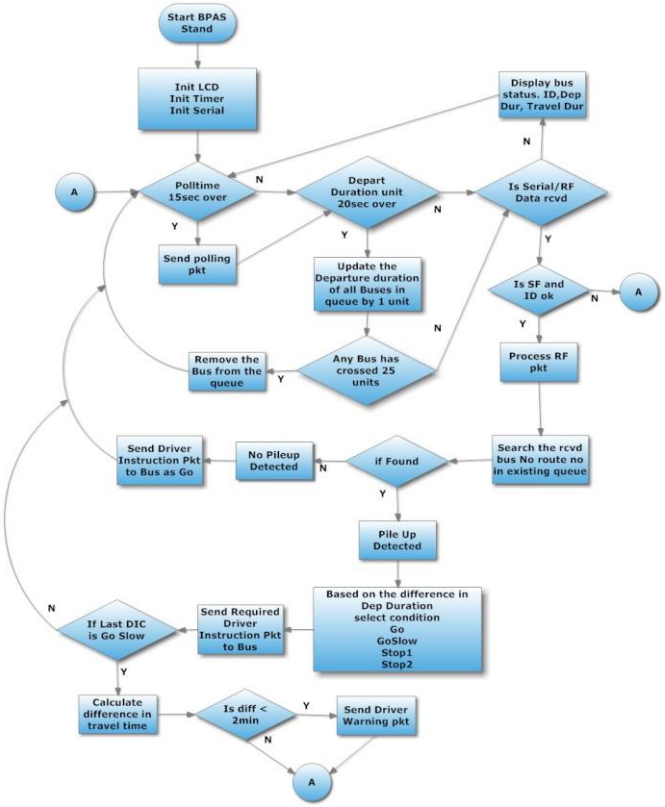

Fig.4 FLOW CHART OF STAND

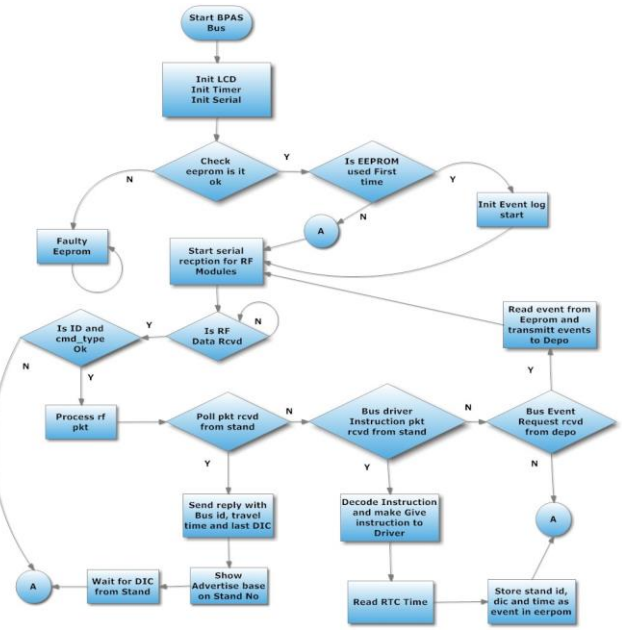

Fig.5 FLOW CHART OF BUS

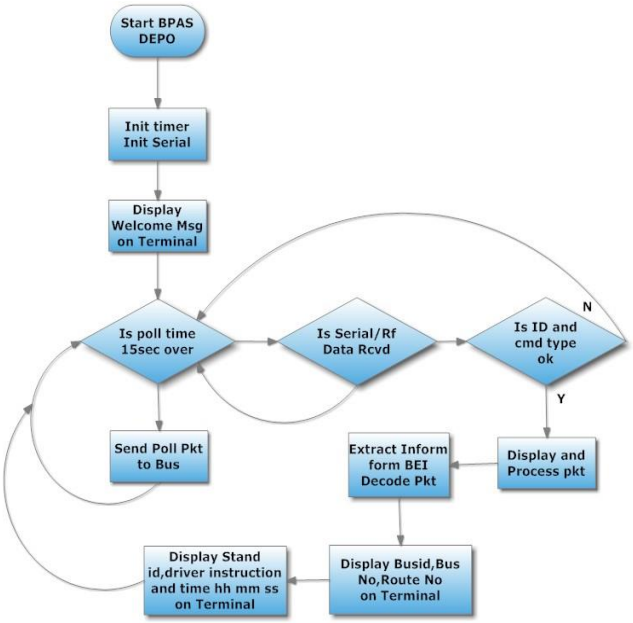

Fig.6 FLOW CHART OF DEPO

IV. HARDWARE AND SOFTWARE REQUIREMENTS

HARDWARE REQUIREMENTS

- Microcontroller SST89x516RD2 or equivalent
- 16*2 lcd
- Eeprom-AT24C64
- Rtc DS1307
- 2.4GHz CC2500 transceiver
- 3 indicators Red Green and Yellow
- Driver IC like ULN20013

SOFTWARE REQUIREMENT

- µvision Keil to write, compile, debug and simulate embedded code.
- Hyper Terminal to interface to serial port and test various parts of project
- Turbo C with Graphics library
- Flash Magic for program downloading

PC REQUIREMENTS

- OS: WinXP SP2 or Win7
- CPU: Pentium 4 or higher
- RAM: 512MB or higher
- Hard Disk: 80GB or higher

V. ADVANTAGES

- This framework helps in lessening Bus heap ups and henceforth the end client will get the benefit as far as

higher quality transport administrations and less holding up length.

- Buses inciting together at a similar term for a similar goal can cause genuine activity clogs, however with this framework in real life, bus heap ups will be maintained a strategic distance from and the movement congestion will turn out to be better.
- End clients will likewise be pleased with the bus administrations and as opposed to utilizing their own particular vehicles, they will lean toward public transport, which will bring about less vehicles out and about in this manner causing lower contamination, less activity and low utilization of mineral oil.
- System is anything but difficult to execute and get it.
- Running cost is likewise low.
- If an arrangement to enroll objections can be added to the framework, at that point drivers will be more restrained.

VI. DISADVANTAGES

- Primary structure cost is high, yet that is single time consumption to change the transport.
- RF intercommunication is utilized permitting and can be an issue, so we need to take after the principles and directions thoroughly.
- System can make bothering the drivers and they may feel mentally upset by the framework and confinement in their free driving strategies.
- Stealing of hardware framework from busses and stand is dependably an issue in couple of territories of city or nation.

VII. APPLICATIONS

- Prime application of the project itself is described in the name of the project it avoids the pile up of the buses.
- By avoiding pile up of buses of same route no we here maintain a good frequency of the buses.
- Transport department and passenger both will have advantages.
- Passengers and commuters will benefit from this, and our project will make the transport system an intelligent and efficient transport system which is like and used by more people.
- Hence modal shift will be seen people will leave their own transport and use public transport, this will decrease traffic congestion, pollution and oil imports.
- Project has parameters defined and recorded in eeprom for driver and system performance measurement and analysis.

VIII. RESULT

Impact of bus pile up avoidance system on bus availability is shown in the graph below:

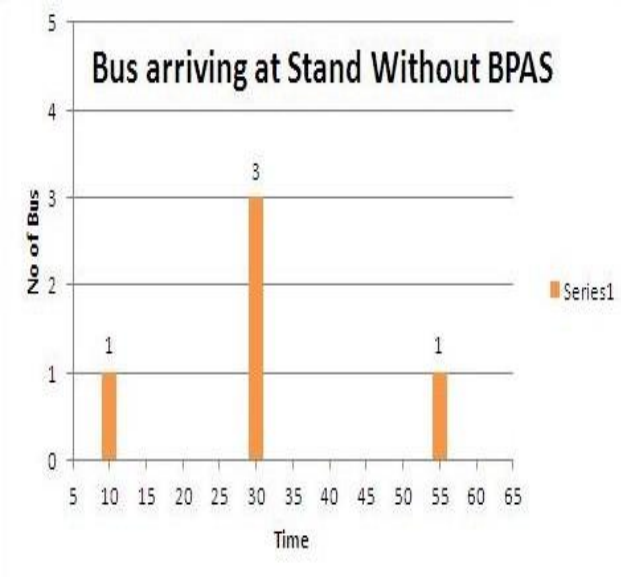

Fig.7 WITHOUT BPAS

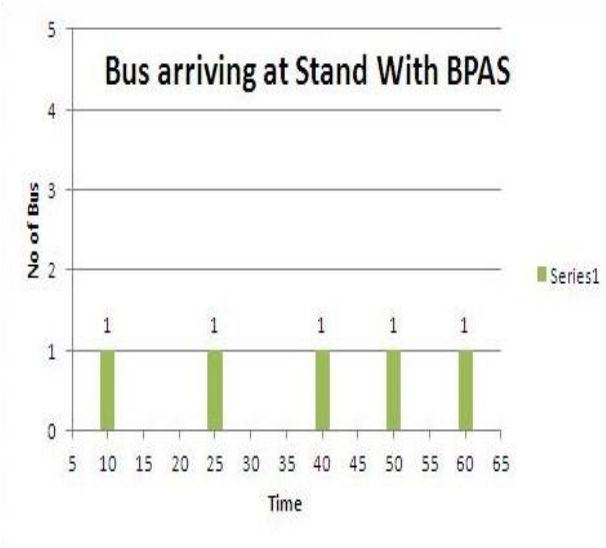

Fig.8 WITH BPAS

From the above given figures the efficiency of BPAS is been showed.

We have taken number of buses in X axis and time in Y axis.

In fig.7 and fig.8 we show the comparison between not using BPAS and using BPAS.

The fig.7 tells that the number of buses with the same route are more at 1 time and that the pile up is been detected and on the other time the number of buses are less.

In fig.8 using BPAS, at all-time number of buses at same route are seen and pile up is not present.

IX. CONCLUSION

In this paper we have exhibited BPAS and portrayal is surrendered about the heap issue, its effect and furthermore offered a clarification utilizing remote system and correspondences.

We actualized a lining calculation at stops and act signing in busses to manage and to propel the bus recurrence, BPAS execution and driver work.

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