
A REVIEW PAPER ON INTELLIGENCE TRANSPORTATION SYSTEM

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ABSTRACT

Transportation is the medium through which one can travel from one place to another place. In all form of transportation, road transportation is very common. Now these days road transportation is facing a lot of problem like signal rules break , high volume congestion, problem for pedestrian, hit and run case like conflicts etc. After keeping all these points in mind, I think Intelligent Transportation system (ITS) is the one and only solution for these problems. ITS has well established in developed countries from past two decades, but for under developing nation like India, China, South Africa, Brazil etc it is still an unknown concept. Motive behind this paper is just to give light on Intelligent Transportation System and its branches i.e. ATIS, ATMS, APTS, EMS etc. In this paper we will discuss about that how ITS will solve the above problems. Apart from that another point which will become the important part of ITS in future i.e. Sensor Based Road System. This paper is to compare analysis of different writers research papers on the concept of ITS. After analyzing other theories and some new concept regarding ITS this paper have been reviewed.

The criteria used by the ITS will probably differ from those used in computer networks, which normally aim to minimize congestion and maximize bandwidth use. Other factors that ITS systems may take into account include decreasing journey time, lowering fuel/electric usage, reducing congestion, wanting to visit specific sites, battery optimization, and human preferences. An ITS architecture is the framework inside which a system of ITS projects is designed.

Keywords: ITS, ATIS, ATMS, APTS, EMS, Sensor Based Road System.

I. INTRODUCTION

Intelligent Transportation System is the system which is based on advance technology. It uses advance information and telecommunication network, use of sensors in vehicle, electronic or digital technology for controlling the congestion and conflicts(incident).

It has been observed that from past two decades countries are developing a lot either in the field of infrastructure or in the field of transportation. Traffic problems are arising day by day, this is because of increase in the volume of running vehicles. This has increased the number of annual accidents too. This is the major problem faced by world. In that case ITS and its well designed feature will help to overcome this problem.

In this paper different concept of ITS have been studied and reviewed which have developed by the various researcher all over the world. Application of ITS for the traffic management and control has been categorized into four major parts i.e. ATMS, ATIS, APTS and EMS. They cover all the elements which are related to transportation and need to be improved.

Intelligent Transportation System works on the advance technology like communication (Bluetooth, internet, microwave etc), location detection (GPS) and geographical information system. Apart from that ITS is also based on data interpretation, camera system, artificial vision detection, digital mapping and classification in vehicle system. The GPS project was started by the U.S. Department of Defense in 1973. The first prototype spacecraft was launched in 1978 and the full constellation of 24 satellites became operational in 1993. Originally limited to use by the United States military, civilian use was allowed from the 1980s following an executive order from President Ronald Reagan after the Korean Air Lines Flight 007 disaster. Advances in technology and new demands on the existing system have now led to efforts to modernize the GPS and

implement the next generation of GPS Block IIIA satellites and Next Generation Operational Control System (OCX). Which was authorized by the U.S. Congress in 2000.

It states that ITS proves to be useful in the following manner:

- Improved mobility for people and freight, including greater access to transportation for the elderly, the disabled, and people living in remote locations.



Figure1. Intelligent Transportation System

- Greater compatibility of surface transportation with the environment
- Fewer traffic-related deaths and injuries
- A better-managed transportation system.
- Less travel uncertainty, allowing for better planned, quicker, and less expensive travel.
- Advanced Traveler Information System (ATIS)
- Advanced Traffic Management System (ATMS)
- Advanced Public Transportation System (APTS), and
- Emergency Management System (EMS)

II. LITERATURE REVIEW

Kashif Naseer Qureshi et al. (2013) reviewed the brief discussion and literature of the areas of ITS Metropolitan deployments. They discussed the problems regarding the transport system and gave the solutions with accordance with the problems.

The literature review regarding the various areas of management systems in ITS are tabulated below:

Table. 1 Literature review of Freeway Management System

Author(s)	Title	Problem	Solution
Hussein Dia, 2011	Development and evaluation of arterial incident detection models using fusion of simulated probe vehicle and loop detector data	Non automatic detection of incident	Incidents are detected by on arterial roads by using loop detector technique
Bachman, 2013	A comparative assessment of multisensory data fusion techniques for freeway traffic speed estimation using micro simulation modeling	Estimation of exact time traffic speed	Technique based on seven multi sensors that were fused together

Table.2 Literature review of Emergency Management System

Author(s)	Title	Problem	Solution
James H. Lamberta, 2013	Understanding and managing disaster evacuation on a transport Network	Damaging accomplishment of transportation system	Analysis of transportation system

- **Thirumalaisamy Ragnathan et al. (2015) [2]** investigated the structure and design for an ITTS system and discussed the practicable details of the model system developed by them. This system plans to enhance the intelligent tour schedule of the system and install the system in the web for public use.
- **Ling Sun et al. (2016) [3]** presented the intelligent co-operative system in which two vehicles are dependent to each other and the two motorists (drivers/travelers) interact with each other to exchange their dynamic data by the use of internet. Each component in co-operative intelligent transport system has a core (a core in each roadside system, central system, vehicle system, personal system) that is interconnected to each other. Vehicles exchange data, control mechanisms and stay interconnected during the travel time.
- **Sergei Korjagin (2017) [4]** presented the study that deals with intelligent transport security systems. He discussed the use of intelligent transport security systems that intended to lower traffic accidents and threats, increase the traffic capacity of road network, diminish the delays in traffic flow and ameliorate traffic safety. This paper also ensured continuous flow of land urban passenger transport in Backache and Korjagin (2015). The studies of Russian and European experience showed the application of ITS that enabled to reduce roads and traffic authority (RTA) level by 30%. The work presents a bio cybernetic traffic management assumptions based on ITS. The set of assumptions was planned to combine large traffic control at road and transport conditions with fine adjustment at the small level of physiological and intellectual actions taken by driver.

KEYWORDS:- Explain the keywords in detailed are as follow.

1. Advance Traveler Information System(ATIS):- It is based on the advance communication and telecommunication such as internet, telephone, cellular phones, television, radio etc to inform the drivers and travelers in making the right decision regarding traveling, arrival, departure, possible routes, easy way or shortcuts and available sources of traveling. ATIS provides information to the driver about en-routes and pre-trip. En-routes informed about the all possible routes for reaching the destination. Pre-trip information provides the driver self confidence to use the freeway and to drive the safe journey. Global Positioning System play avital role in ATIS.

2. Advance Public Transportation System (APTS):- APTS works on improving the public transportation and make it more comfortable and reliable for the public. In this way, it helps in increasing the ridership. APTS totally changes the old style of public transportation. Because of APTS who wants to travel, already known with information of real time of any public transport and also know about the possible numbers of public transport towards his destination.

Hence we can say that APTS make the traveling in public transportation more easy and comfortable.

3. Advance Transportation Management System (ATMS):- ATMS is the most important part of ITS. This system is very helpful regarding knowing the volume of traffic on the particular route.

ATMS is mainly used by the traffic control department as a tool to control the traffic congestion.

4. Emergency Management System:- Emergency management system isvery important branch of ITS. It is the fresh topic of research in the field ofITS. EMS works on advance technology. The main motive behind it is to reduce the loss of life during any accident. As we know that in ITS all the routes are under the surveillance of camera system. Whenever in case of any type of conflict(incident) on any route, camera system with help of GPS and GIS catch that location and inform to the head office of operation of ITS,there they will call the ambulance and cop for that particular spot. Inthis way EMS help in saving several lives.

Sensor Based Road System :- Sensor Based Road System is the newest topic for the research in the field of ITS. It is the next level of the ITS. As itis not fully developed yet, it takes another decade to be developed.

The concept behind the sensor based road system is to make the vehicle driver-less and make it run on automatic mode. The idea on which it is working is to provide the web of sensors on the surface of road which will be detected by the sensor provided on the vehicle and hence make it driver-less driving.

Table.3 Sensor components with their use

S.No.	Component	Use
01	Power Unit	Generates power using solar cells
02	Analog- Digital Converter	Conversion of signals from analog to digital

03	Processing Unit	Control the procedures for collaboration
04	Transceiver	For networking
05	Location Finding System	For locating the position of vehicle

III. CONCLUSION

In this whole paper we discuss about the ITS and its feature. In the developed nation it is fully developed but if we talk about the under developing nation still much more to be developed in the field of ITS. For under developing nation if ITS will fully develop then it will play a very important role in developing that particular under developing nation. In the development of ITS, integration of the different modes of transportation is very necessary. Hence the work should be done in this field. In ITS real time information is a very important factor. GPS is one technology which can help in this direction so the work needed to be done towards making GPS more accurate and economical. In usages of the ITS particularly in creating nations its establishment and working expenses are huge elements. ITS can be made more efficient in solving transport related problems.

IV. REFERENCES

- [1] International Journal of scientific & Engineering Research Volume 8, Issue 12, December-2017 ISSN 2229-5518: Nitish Kumar, Kumar Ankit (B.Tech Final Year) SCE DEHRADUN.
- [2] The journal of transport literature- Bhupendra Singh, Ankit Gupta.
- [3] Intelligent transportation system-Summit Mallik.
- [4] Balaji P.G. and Shrinivasan D.(2011) type-2 Fuzzy logic based urban traffic management engineering application of artificial intelligence.
- [5] ITS for developing countries accessed from siteresources.worldbank.org
- [6] Intelligent transportation system-Danish Fayaz BITS Pilani.