INTELLIGANT TRANSPORTATION SYSTEM

SOURABH PASALKAR
Student Civil Engineering Depart.
Universal college of Engineering & Research (Polytechnic Shift II)
Sasewadi, Pune
JAGRUTI DABAKE
Student Civil Engineering Depart.
Universal college of Engineering & Research (Polytechnic Shift II)
Sasewadi, Pune
DHAIRYASHEEL SHINDE
Student Civil Engineering Depart.
Universal college of Engineering & Research (Polytechnic Shift II)
Sasewadi, Pune
BHANUCHANDRA PUJARI
Student Civil Engineering Depart.
Universal college of Engineering & Research (Polytechnic Shift II)
Sasewadi, Pune
YASH VIJAYANAND TANDALE
Asst.Prof.Civil Engineering Depart.
Universal college of Engineering & Research (Polytechnic Shift II)
Sasewadi, Pune

ABSTRACT

Interest in the intelligent transportation system comes from problems caused by traffic congestion and a synergy of new information technology for simulation real time and communications networks. Traffic congestion has been increasing worldwide as a result or increased motorization, urbanization, population growth and changes in population density. Congestion reduces efficiency or transportation

infrastructure and increases travel time, air pollution and fuel consumption. Now a day's development of roads has created a new havoc which lead to the increase in the accident cases all across the world, in order to over-come from such a problem, Intelligent Transport System holds a good point. Intelligent Transport System is designed for the urban/state/private road transport organization. The system consists of a backend and a hardware component to provide an integrated solution for the driver console unit, electronic ticking machine passenger information system amid vehicle tracking system. Intelligent Transport System provides a single solution for transport companies to schedule and monitor buses with the help of advance technologies such as GPS, Wi-Fi and GPRS. Intelligent Transport System facilitates better public transport services by considering the bus earning, public safety and security. This paper basically discusses the impact and the various application fields or Intelligent Transport System for road transportation. Also, this paper put forward the implementation or various transportation technologies that will be vital for homeland security, vehicular surveillance along with technologies that can make our ride more safe and economical

Keywords GPS,GPRS,ITS

1.INTRODUCTION

Intelligent Transportation System (ITS) applies advanced technologies of electronics, communications, computers, control and sensing and detecting in all kinds of transportation system in order to improve safety, efficiency and service, and traffic situation through transmitting real-time information.

Objectives

- To improve traffic safety
- To relieve traffic congestion
- To improve transportation efficiency
- To reduce air pollution
- To increase the energy efficiency
- To promote the development of related industries content

1. Generally, ITS is classified into five systems according to their functions as follows ATMS detects traffic situations, transmits them to control center via communication network, and then develops traffic control strategies by combing all kinds of traffic information. Furthermore, ATMS makes use of facilities to carry out traffic control and transmits the information to drivers and concerned departments,

and implements traffic management measures, such as ramp metering, signal control, speed control, incident management, electronic toll collection and high occupancy vehicle control and so on.

2. Advanced Traveler Information System, ATIS, with advanced communication technology, makes road users can access real time information in the car, at home, in the office or outdoors as the reference of choosing transportation modes, travel trips and routes. The system mainly includes changeable message signs, Highway Advisory Radio (HAR), GPS, the internet connection, telephone, fax, cable television, information Kiosk and mobile etc .

3. Advanced Vehicle Control and Safety System, AVCSS applies advanced technologies in vehicles and roads, and helps drivers control vehicles in order to reduce accidents and improve traffic safety. The AVCSS mainly includes anti-collision warning and control, driving assistance, automatic lateral/longitudinal control, and the long-run plans of automatic driving and automatic highway system.

4. Advanced Public Transportation System, APTS APTS applies the technology of ATMS, ATIS and AVCSS in public transportation in order to improve the quality of service, and increase efficiency and the number of people who take public transportation. The system mainly includes automatic vehicle monitoring, VPS, computer scheduling and E-tickets.

5. Commercial Vehicle Operation, CVO applies the technology of ATMS, ATIS and AVCSS in commercial vehicle operation such as trucks, buses, taxes and ambulances in order to improve efficiency and safety. The system mainly includes automatic vehicle monitoring, fleet management, computer scheduling and electronic payment.

Framework

According to the concept framework of future ITS development planned by U.S. DOT and ITS-America, the relationship between ITS services was defined to ensure the compatibility and the interchangeability. 7 functions and 30 users services provided to drivers are defined as follows:

Travel and transportation management

- Driving information during travel
- Route guidance
- Travel service information
- Traffic control
- Incident management
- Emission monitoring and improvement
- Rail road level crossing

Travel demand management

• Demand management and operation

• Pre-trip information

• Carpool matching and pre-booking

Public transportation operation

• Public transportation management

• Public transportation information during travel

• Personalized public transportation

• The security of public transportation

2. Intelligent transportation systems

Intelligent transportation systems vary in technologies applied, from basic management systems such as car navigation, traffic signal control systems, container management systems; variable message signs, automatic number plate recognition or speed cameras to monitoring applications, such as security CCTV systems, and to more advanced applications that integrate live data and feedback from a number of other sources, such as parking guidance and information systems, weather information, bridge deicing systems, and the like. Additionally, predictive techniques are being developed in order to allow advanced modeling and comparison with historical baseline data. Some of the constituent technologies typically implemented in ITS are described in the following sections

Wireless comunication :-

Various forms of wireless communications technologies have been proposed for intelligent transportation systems. Short-range communications (less than 500 yards) can be accomplished using IEEE 802.11 protocols, specifically WAVE or the Dedicated Short Range Communications standard being promoted by the Intelligent Transportation Society of America and the United States Department of Transportation. Theoretically, the range of these protocols can be extended using Mobile ad-hoc networks or Mesh networking.

Longer range communications have been proposed using infrastructure networks such as Wi-MAX (IEEE 802.16), Global System for Mobile Communications (GSM), or 3G. Long-range communications using these methods are well established, but,unlike the short-range protocols, these methods require extensive and very expensive infrastructure deployment. There is lack of consensus as to what business model should support this infrastructure.

Funding For Transportation Infrastructure And Its:-

Financing transportation infrastructure and deployment of intelligent transportation technologies present great challenges, now brought into sharper focus by the current global economic crisis. Fuel taxes, for example, are becoming less efficient means to raise infrastructure capital and operating funds. Private investors are seeking realistic business models to justify investments in infrastructure. Political leaders are demanding "performance measurements" or what private investors seek in commercial terms: the highest return-on-investment. This session will address economic factors affecting various funding mechanisms and potential public policy strategies and business models to attract private investors. The advantages and disadvantages of various funding mechanisms as well as public reactions and political implications will be assessed.

Its techniques to improve local air quality and reduce global warming:-

For many cities emissions from road transport are a difficult problem. The emissions from vehicles affect citizen's health but also are a growing cause to global warming. There is a great need for methods and techniques to calculate and to process emission data to support management strategies. ITS can play an important role in supporting these efforts. This session will give examples on how new strategies and methods have been deployed in Stockholm and London. Greenhouse gas reduction strategies incorporating ITS for congestion charging, mobility management, goods logistics and stimulating more people to use public transport and clean alternative fuelled vehicles will be described. The session will also present new high resolution ITS based techniques to collect and to process ambient pollution data for new approaches to traffic management.

Balancing safety, security and efficiency in transport systems a global challenge :-

Global transport systems are characterized by logistic chains that must flow smoothly in order to secure critical financial and material assets. At the same time, these flows must be protected from external threats, such as sabotage, while maintaining a sufficient level of safety and efficiency. The concept of resilience engineering has emerged during the last years as an approach aimed at incorporating

capacities for coping with both internal and external disturbances into a system. Resilience engineering agrees with the idea that no system can be 100% safe or secure, rather it must have the capacity to cope with both regular (well known) threats, irregular threats, as well as the unforeseen ones. This session invites scientific as well as pragmatic contributions to the topic of improving resilience in any mode of the transport domain.

Reducing greenhouse emissions and fuel consumption sustainable approaches for surface transportation :-

Climate change is rapidly becoming known as a tangible issue that must be addressed to avoid major environmental consequences in the future. Recent change in public opinion has been caused by the physical signs of climate change-melting glaciers, rising sea levels, more severe storm and drought events, and hotter average global temperatures annually. Transportation is a major contributor of carbon dioxide and other greenhouse gas emissions from human activity, accounting for approximately 14% of total anthropogenic emissions globally and about 27% in the USA. Fortunately, transportation technologies and strategies are emerging that can help meet the climate
challenge. These include automotive and fuels technologies, intelligent transportation systems (ITS), and mobility management strategies that can reduce the demand for private vehicles. This session will explore the role of each of these key strategies and the interplay among them.

3. Passenger car unit (PUC) :-

It is a common practice to consider the passenger car as the standard vehicle unit to convert other vehicle classes. This unit called as passenger car unit.

SR.NO.	VEHICLE CLASS	EQUIVALENCY FACTOR
1.	Passenger car , tempo , auto-rickshaw , agricultural tractor	1.0
2.	Bus , truck , agricultural tractor-trailer unit	3.0
3.	Motor cycle , scooter and pedal cycle	0.5

4.	Cycle rickshaw	1.5
5.	Horse drawn vehicles	4.0
6.	Small bullock cart and hand cart	6.0
7.	Large bullock cart	8.0

Table No 1 :- Tentative Equivalency Factor Suggested By The IRC

4.Traffic density calculation of navale bridge with respect to equivalency factor

SR NO	VEHICLE CLASS	EQUIVALENCY FACTOR	TOTAL VEHICAL COUNT	TOTAL VEHICAL CALCULATION WITH REPECT TO EQUIVALENCY FACTOR
1.	HEAVY VEHICLE	3	800	2400
2.	CARS	1	1275	1275
3.	THREE WHEELERS	1.5	789	1184
4.	TWO WHEELER	0.5	15031	7515

Table No 2 :- Calculation Of Traffic Density With Respect To Equivalency Factor

5. Conclusion

- The use of ITS in some developed countries like America , Japan and England as given them high progress in the field of transportation and helped them in their economic progress
- The traffic congestions , rate of road accidents , wastage of fuel will decreased to a large extent
- This gives the people of the country a more economic mean of transportation with advance information of transit

- Hence with much more interest and advanced research in the field of ITS , it can be implemented in our country and can prove to be the solution of the traffic problems including traffic congestion , air pollution and traffic accidents

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