Intelligent Traffic System Services for India

Amrita Yadav
Assistant Professor
School of Computer and Systems Science
Jaipur National University, Jaipur, India

_____

Abstract: **This paper describes the concept of intelligent traffic and Transportation systems which is the major highlight of our country in the present scenario. How intelligently can we control the traffic management system and how the traffic jam can be reduced is the basic highlight of the paper. I have discussed certain projects made in other countries which can be much helpful to get an overview on how the system works.**

Index Terms- **Traffic, centralized, automated, cooperative, intelligent**

_____

I.INTRODUCTION

Intelligent Traffic Systems and Services are a wide range of information which improves the transportation system. Traffic situations and all the irregularities are transferred in real-time enabling a better management of traffic flow. The road users can easily get traffic and weather updates quickly so that they can plan their movements according to the situation. Automated confrontation detection can lead to quicker responses. The public transport will be more beneficial with real-time timetables and will be easy to access route information services. Altogether, Intelligent Traffic System reduces congestion and optimize the traffic conditions and even save lives. The need for mobility is increasing heavily with globalization which can lead to brutal air and noise pollution. Smart traffic can have positive effects on these ecological problems by helping people to reach their destinations more quickly and directly. With the help of intelligent transportation and traffic systems we can move around more safely, quickly and with ease. It helps us to eventually be smart in traffic. Intelligent systems in the world of Internet of Things overlay the way for effortless travelling.

There will be no queuing up on roads where traffic jam blocks both lanes and no more annoying waiting for the bus since everyone will know exactly when the bus will be there. Also need not to search around looking for parking place since you already know where to find it. And you can even predict where the roads are busy and choose another way. This is all because the traffic is going to turn smart.

Fig.1Traffic system in India

II.INTELLIGENT TRAFFIC SYSTEM AT OTHER PLACES

Addressing traffic congestion was one of the initial motivations to look at intelligent traffic systems solutions for a better utilization of transport capacity with the exchange of real-time information on infrastructure and traffic conditions. Since then, new transport applications based on information and communications technologies (ICT) emerged and continue to come into sight, ranging from basic traffic management systems (e.g. navigation, traffic control) to monitoring applications like closed-circuit television (CCTV) security systems to more advanced applications integrating live data and feedback from a variety of information sources (e.g. parking guidance, weather information). The Centralized processing of data on the natural and infrastructure conditions of a road network makes possible to generate alerts and indicate speed and make route recommendations for a vehicle based on its location at any given time. According to Steve Phillips, Secretary General of FEHRL (Forum of European National Highway Research Laboratories) 'Road owners face growing challenges in keeping the network fit for purpose in the face of the damaging effects of increasing traffic and a changing climate'. Work in INTRO (Intelligent roads) and related FP6 projects contributed to a better understanding of the ways in which the growing aspects of infrastructure complements research in the traditional areas. For example, introducing technologies to make bridges stronger with new materials can also present opportunities to make them smarter, by adding facilities like self-monitoring .

Fig.2 Intelligent Traffic System

REACT

Realizing enhanced safety and efficiency. Started on 01/01/2005 and completed on 31/12/2006

The REACT system was demonstrated in Munich in September 2006, it senses natural conditions within the vicinity of suitably-equipped vehicles, and transmits the real-time data to a centralized server, where the data can be analyzed by prediction and decision-making models. It generates safety alerts, speed and route recommendations to individual drivers, and also relevant information for road and law enforcement authorities. REACT is able to cover roads outside the reach of conventional traffic management systems.

INTRO

Intelligent roads. Started on 01/03/2005 and completed on 29/02/2008

INTRO demonstrated the use of new and existing sensor technologies in pavements and bridges can be combined with data from moving vehicles to provide operators, maintenance authorities and road users with rapid warning of emerging problems. It uses simulator which studies and trials with probe-equipped cars and to explore factors like the effects of slippery roads and reduced visibility

MISS

Monitor Integrated Safety Systems. Started on 01/12/2004 and completed on 31/03/2007

The basic purpose of MISS was to enhance the safety and efficiency of transport operations through dynamic sensing and prediction of natural and infrastructure conditions. Its platform comprises a Unified Operative Centre equipped with fixed and mobile devices and a 'black box' for sensing and communication units installed in vehicles. Extensive field tests were conducted under operational conditions in Bologna, Italy and in other European cities.

III.COOPERATIVE SYSTEM

By closing the loop and using the vehicles themselves to send data back to traffic control centers can bring large improvements in the efficiency of management and the safety of road users. As said by Vincent Blervaque, Director of Development and Deployment at ERTICO – ITS Europe, "It can allow much fuller coverage of the road systems than is possible today". The need now is for large-scale testing and demonstration, backed by hard facts to show the authorities and the public that how will they be benefitted. Most of the national highways in European countries are already equipped with dynamic traffic management and control, through surveillance cameras, sensors and electronic message signs which aim to regulate flows by informing drivers about expected travel times to various destinations and displaying traffic jam or accident warnings. The improved availability of information from every vehicle is perfect with the technology in which the data can be managed, will effectively increasing the quality and reliability of personalized information available to drivers about their immediate environment and impending situations. They would be able to receive more complete information about traffic hazards and jamming which will be displayed in their vehicles. New interfaces also enable to exchange requests and recommendations, while communication would allow safer interaction with home and office through the Internet.

IV.APPLICATIONS

Energy efficient

Intelligent traffic system also optimizes the energy-efficiency of the vehicles themselves. Electronic components account for 20-30 % of total production costs for all categories of car, and according to the reports this figure could possibly reach more than 50% in the coming years. In conventional petrol- or diesel-powered vehicles, electronics improves fuel economy by managing the fuel injection, thermal systems and battery charge/discharge cycles. Moreover, hybrid vehicles, having regenerative braking and start-stop systems, have a substantially higher semiconductor content than regular passenger cars. Fully electric vehicles can also rely heavily on computerized systems to extend their autonomy and prolong battery life by monitoring and managing the complex packs of lithium-ion cells. Especially, the rising variety of functionality seen as essential to comfort and safety presents the problem of added power train compromising an already limited driving range. New intelligent systems will be needed for integrated control of the many sub-systems involved.

Automated Transport Systems (ATS)

Automated metros, trains and airport shuttles have been in service for a number of years. New kinds of ATS are now being developed by researchers throughout the world.

Trip advisors

This is another important direction for research in the promotion of door-to-door journeys, which combine different forms of transport, taking into account traffic congestion, environmental impact, cost, time, comfort and accessibility, based on data provided via RTTI services.

Integrated travel planners

It can also be called as **demand-responsive transport** (DRT), which is now being developed in various cities and regions. DRT employs small/medium-sized vehicles operating flexibly in shared-ride mode between pick-up and drop-off points of passengers' choice. With the support of cooperative systems, trip planners could provide real-time schedule of data for bus stops or rail stations, so that DRT could be fully synchronized with the fixed line services.

Fig.3 Smart Traffic System

V. CONCLUSION

The role of intelligent system is to play an important part in securing the future of mobility against increasing economic, environmental and societal pressures, this traffic system can play a major role. Higher priority will be placed on policies for the prevention and avoidance of congestion, which include measures such as access control and road charging. It will enable connected vehicle-infrastructure communication systems to deliver real-time and context-sensitive information to enhance safety and improve the efficiency of road usage so as to reduce environmental impact. New generations of traffic management systems will integrate data from vehicles, to provide dynamic control of traffic flows.

REFERENCES

[1]. W. Lin and J. Zeng. Experimental study of real-time bus arrival time prediction with gps data. *Transportation Research Record*, (1666):101–109, 1999.

[2]. http://publications.europa.eu/others/agents/index_en.htm.

[3]. http://www.pluggd.in/indian-trafficentrepreneurial-lessons-297/.

[4]. V. Jain, A. Sharma, and L. Subramanian. Road traffic congestion in the developing world. In *ACM DEV*, 2011.

[5]. A. Quinn and R. Nakibuule. Traffic flow monitoring in crowded cities. In *AAAI Spring Symposium on Artificial Intelligence for Development*, 2010.

[6]. W. McShane, R. P Roesss, and E. Prassas. Traffic engineering. In *Prentice-Hall, Inc*, 1998.

[7]. B. Coifman and M. Cassidy. Vehicle reidentification and travel time measurement on congested freeways. *Transportation Research Part A: Policy and Practice*, 36(10):899–917, 2002.

[8]. I.Magrini G. Manes A. Manes B. Barbagli, L. Bencini. An end to end wsn based system for real-time traffic monitoring. In *EWSN*, February 2011.