

# The importance and necessity of lack of delay in exchange of information and data of intelligent transportation systems

Ali Mohebi  
Islamic Azad University  
Tehran, Iran  
Email: Ali\_1370\_moh@yahoo.com  
Tel Number: +98-919-5619674

Farnaz Kheibari  
Islamic Azad University  
Tehran, Iran  
Email: Farnaz.kheibari@gmail.com  
Tel Number: +98-912-6657642

Mehdi Yar Mohammadi  
Islamic Azad University  
Tehran, Iran  
Email: Yarmohamadi677@gmail.com  
Tel Number: +98-912-1870617

Esmail Alizadeh  
Islamic Azad University  
Tehran, Iran  
Email: Sm.alizadeh1@gmail.com  
Tel Number: +98-912-2947696

**Abstract**—The existence of a series of problems in transportation management of public and personal vehicles causes to consider intelligent transportation systems. Hence, here we investigate to introduce and the performance of intelligent transportation system ITS which is among new technologies in information technology and at last the importance and necessity of lack of delay in data and information transfer.

**Keywords**—*intelligent transportation system; traffic management; vehicle communications*

## I. INTRODUCTION

Nowadays according to population growth of humans in metropolises and capital of each country and purchase ability of personal vehicles by public from several decades ago to now causes increase of vehicles in urban and also suburban transportation navy and on the other hand the result of this event is the creation of air pollution, traffic density, accidents, wasting time of passengers and lack of control of vehicle traffic flow. Also by increasing trend of vehicle, urban and road construction such as widen streets and highways, their lining and maintenance will be performed and annually it takes a lot of expenses. Accordingly, attention to special managerial system for transportation will be felt, but we can use new technologies such as intelligent transportation system or ITS to manage transportation and best decisions will be made for noted problem solving.

## II. ATTENTION PLACE TO INTELLIGENT TRANSPORTATION SYSTEMS

Since population growth and urban and suburban trips cause pollution, accidents, wasting time, high consumption of fuel, traffic and vehicle crowd, the existence of crossing problems and on time arriving of necessary vehicle such as fire stations, emergency, police, red crescent ,etc to their destinations are considerable. For facilitating in traffic trend, more roads and highways will be made. Hence instead of high expenses in road construction, safety, lining, their repairs and maintenance in consecutive years, we can overcome on traffic facilitating and traffic control by applying intelligent transportation systems with less expenditures.

## III. THE ROLE OF MANAGEMENT SYSTEM OF TRANSPORTATION IN LIFE AND SOCIETY

Implementation of such systems can have a crucial role in declining accidents, fuel consumption, air pollution, city crowd, increasing road safety and lives. Also we cannot ignore its role in academic, scientific and knowledge-based communities, because it forces interested engineers and students for doing studies and presenting solutions and modern methods for better management of transportation and eventual problem solving of such systems. Implementation and performance of intelligent transportation systems in long-term causes return of present additional expenses in traditional transportation systems to government and treasury.

#### IV. INTELLIGENT TRANSPORTATION SYSTEM (ITS)

It is said to a collection of components and special facilities such as hardware, software, telecommunications technologies, urban engineering and traffic rules that interacts each other and it performs to achieve main purpose as transportation management.

#### V. THE APPLICATIONS OF INTELLIGENT TRANSPORTATION SYSTEM (ITS)

This system consists of information system of passengers, system and vehicle, system of traffic management and payment system of transportation. In the following, we mention the applications for sample that used in each system:

- Information system of passengers: Noticing the time of vehicle transition in stations, weather conditions, present traffics in passages, accidents, routing and navigation map.
- Vehicle system: Vehicle with vehicle communication devices, communication devices of vehicle with roadside sensors, alarm system of vehicle speed, receive and send system and braking alarm of front vehicle.
- System of traffic management: cameras, traffic lights, warning panels, traffic control center.
- System of transportation payment: Getting toll in highways, traffic designs in some district and passages of cities, even and odd daily plan.

#### VI. MECHANISM INTELLIGENT TRANSPORTATION SYSTEM (ITS)

The main and operational core of this system is included into technology of control, information and data. In general state, we can say that intelligent transportation system is made of three important parts:

- A. *Intelligent road: installed equipment in substructure part with defined standards in roads for exchanging data and information in road to drivers or vehicles.*
- B. *Intelligent vehicle: Necessary installable instruments and equipment on vehicles that are necessary for the performance of ITS.*
- C. *Communication infrastructure: It is said to a situation that makes the relationship between intelligent road and vehicles.*

In this system, data and information will be received by these three parts and also will be sent to center for processing their management of communication substructure.

#### VII. WAY OF WORKING OF INTELLIGENT SYSTEM (ITS)

Different sensors are used in this system. One of sensors is acoustic sensor that acts as pulse wave form and recognizes and counts presence or absence of a material. It will be measured after sending pulse on its road surface and if there is difference between sent pulse, it shows the presence of vehicle or machine. These acoustic pulses that are higher than hearing domain of a human is changed to electrical energy and will be sent to processor. Acoustic sensors are affected based on change of environment temperature and weather situation and it may mistake in performance although in recent years, problems have been solved with production of new and advanced sensors and sensors will be responded in each weather situation with the least disorder, but again we consider it as a problem that may affect. Another type of these sensors is Doppler sensor in which a sensor is sender and other sensor is receiver. In these sensors, pulse width of made signal is measured and we can measure the speed of vehicle by it. When installed sensors are collected their data, they will be sent to control center of transportation through wireless or optical fiber or other communication equipment and in this center, necessary thoughts will be made by liable for traffic control based on traffic engineering and transportation management.

#### VIII. THE EFFECTS OF LACK OF INTELLIGENT TRANSPORTATION SYSTEMS

By lack of this system, control organs and transportation management such as municipalities, traffic police, transportation companies ,etc cannot collaborate each other and having any control and management on arterial roads and important highways and it causes noted problems such as traffic, fuel consumption, accidents, air pollution, chaos , etc in metropolises.

#### IX. PROPOSITIONS & SOLUTIONS INTELLIGENT TRANSPORTATION SYSTEM (ITS)

For implementing and performing this intelligent technology in transportation managerial system, social, economic and cultural situations of that country should be considered, because ITS architectures are implemented based on this conditions and we cannot perform and implement ITS architecture of each country in other countries. Accordingly, we can perform important proceedings (such as scientific educations, presenting briefing plans of profit and loss rate of this plan, making substructures, attract the opinion of managers

and governmental officials and investors of this part, presenting national and special architectures of each country, making an organization and independent institution for this work, planning ,etc) to receive main purpose that is help to improving traffic management.

## X. CONCLUSION

In this study, according to population growth and increasing vehicles in urban and suburban passages and making density and traffic problems such as accidents, wasting energy and time of passengers and drivers, intelligent system is introduced to do traffic management by it and to some extent solve problems. Also applications, effects, performance, prepositions and way of working ITS and introducing sensors, this type of system is mentioned to understand if information will be published on time and without delay, optimized and suitable system acts, otherwise if information is exchanged with delay or a problem as noise makes disorder in exchanging information, correct performance of system is not possible. We can conclude that exchanging information has direct effect on ITS or intelligent transportation system.

## ACKNOWLEDGMENT

With special thanks to Dr. Mohammad Hossein Ahmadzadegan , professor of Islamic azad university for his efforts and guidance.

## REFERENCES

[1] Bhupendra Singh1, Ankit Gupta, “Recent trends in intelligent transportation systems”, Journal of Transport Literature, Apr 2015.

[2] Garima Mathur, “ Review Of Intelligent Transport System Architecture And ITS Applicabilty In Traffic Monitoring And Control, Using Sensor Networks”, International Journal of Science, Technology & Management, March 2015.

[3] Elyes Ben Hamida, Hassan Noura and Wassim Znaidi, "Security of Cooperative Intelligent Transport Systems: Standards, Threats Analysis and Cryptographic Countermeasures", Electronics, 2015.

[4] Alberto Fernández-Isabel, Rubén Fuentes-Fernández, "Analysis of Intelligent Transportation Systems Using Model-Driven Simulations", Sensors, 2015.

[5] Isabel Wilmink, Tanja Vonk, "Applying Intelligent Transport Systems to manage noise impacts", Proceedings 10th European Congress and Exposition on Noise Control Engineering, EuroNoise, 2015.

[6] Javad Shakeri, Meysam Dirin, “Applying wireless sensor network in intelligent transportation systems”, civil and environment research journal, 2014.

[7] Sina Pur Heydar, “ A survey on applying intelligent transportation systems in management of urban traffic”, Second international conference of electronic municipality, 2010.

[8] J.Mir Katouli, H.Mosa Zade, B.Ata, M.Kiaei, “ Improving the quality of urban transportation by using communication substructures in electronic city”, The first Congress of Urban Management and City Council, 2015.

[9] Z.Nori, Z.Kamoussi, B.Rafiei Mehr, “ The survey of technology place of vehicle communications in intelligent transportation systems”, Journal of promoting the development of industrial technology, 2012.

[10] Babak Mirbaha, Reza Asadolahi, “ Explaining performance process of intelligent transportation systems in traffic management of suburban directions”, Tenth international conference of traffic and transportation engineering, 2012.

[11] Seyed Mohammad Hosein Dehnad, “ The survey of effects and applying intelligent transportation systems in declining energy consumption”, The first International Conference on Emerging Trends in Energy Conservation, 2012.

[12] A.Kiyan Pour, S.Azizi, “Proposed a new classification for network routing between the vehicle”, National Conference on Science Engineering new ideas, 2015.

[13] M.Hokm Abadi, H.Ashraf, “ Intelligent transportation design based on strategic”, Articles Collections Saha electronic engineering company, 2012.