Challenge of Intelligent Transport System

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ABSTRACT : *Intelligent transport system increase rapidly where Cities face urgent transport challenges. Many are starting to tackle them by implementing new intelligent transport systems, and some have achieved impressive benefits ,This paper describes show the intelligent transport system applications have Challenges dependent on knowledge of citizen manners and geographic places. The study shows the important role for transport, particularly in big cities. In particular study compares between problem and possible solution and approach of ITS.*

Keywords: ITS, urban motor vehicle, ANN, HCI

I. Introduction

Today in the 21st century information technology (IT) plays an important role of our life activity. The IT product market ranges from toothbrushes to automated vehicle systems. Today the importance of ITS increase rapidly where Cities face urgent transport challenges. Many are starting to tackle them by implementing new intelligent transport systems, and some have achieved impressive benefits.

Intelligent transportation systems (**ITS**) are advanced applications which, without embodying intelligence as such, aim to provide innovative services relating to different modes of transport and traffic management and enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks[1]. Today the importance of ITS increase rapidly where Cities face urgent transport challenges. Many are starting to tackle them by implementing new intelligent transport systems, and some have achieved impressive benefits.

UNECE Transport Division asked about trends in urban transport sector and Summarization their answer by this point:

- Rapid growth of urban areas: cities are major engines of growth in most countries
- Very rapid increase in motorization: urban motor vehicle ownership and usage is growing even faster than the urban population
- Substantial increases in traffic congestion: ownership and usage of cars is growing much faster than the ability to provide road space and alternative means of coping with the problem
- Relative decline of public transport usage and services: the growing reliance
- Private vehicles has resulted in a substantial decline in the trips being provided by urban public transport systems in many cities
- Shift from public to private sector provision of services and facilities

Recognizing the inability of the public sector to provide adequate finance for urban transport infrastructure and in many cases, the relative inefficiency of the public sector in providing urban transport services, the public sector is increasingly relying on the private sector to provide these facilities and services.

- Shift from new road construction to intensive management of urban road
- Networks and improved public transit: there is a growing recognition that cities cannot build enough road
- capacity, especially in city centers to accommodate the growth in travel demand by means of the private vehicle
- Rapid introduction of Intelligent transport Systems: the relatively recent development of improved intelligent technologies has resulted in many
- Applications being rapidly deployed in many cities as a means of better utilizing urban transport facilities potential for better acceptance and deployment of demand management techniques.

- Transport planners and economists have been advocating for years the logic of charging road users for the use of scarce road space, primarily as a means of maximizing the use of urban roads during congested periods and secondarily as a means of securing additional funds for transport investments
- Revival of multi-modal urban public transport in which trams and trolley-buses have distinctive roles to offer the services and keep the historic face of the cities
- Conversion of public transport terminals into commercial areas, where basic public services are also to be found is a particular trend in many ancient cities in Europe, but not exclusively
- Emergence of eco-cities with a strong emphasis on modern public transport where walking and cycling is not an occasional chance, but where they are properly planned for and supported [2].

At the same way it is noted Transport systems play a critical role in supporting socio-economic activities all over the world, and especially, enhancing the activity and attractiveness of urban areas requires a drastic improvement in transport systems in order to provide users with better services, high reliability, high frequency and low emissions [2].

The ITS applications can play an important role for transport, particularly in big cities. In particular:
- Improving traffic flow
- Improving road safety
- Improving security and reducing crime
- Improve response time to incidents
- Improving traveler information
- Improving public transport
- Improving freight efficiency
- Improved traffic flow and more accurate
- Improving the environment

On the same approach IBM study was interested by importance of Regional transport as:

Emerging Markets
- Increasing urbanization (especially in the mega cities) has led to difficult blockage, which has negative economic and health effects. Financing and safety are major issues.
- Most cities are focused on developing their transport infrastructure, especially highways, railways and metro systems, while improving their traffic systems. Leading cities, including Dubai, Beijing and New Delhi, are implementing ambitious and innovative programs

Asia Pacific (mature)
- The mature Asia-Pacific cities include several global transport leaders (e.g., Tokyo, Seoul and Singapore), which have extensive public transport systems.
- Regional innovations include advanced traffic and bus management systems, integrated fare systems and traveler information. Congestion remains a key concern, with several cities/countries considering various congestion charging solutions

Western Europe
- Most European cities already have expansive roads and public transport infrastructure. Europe is also home to many pioneering leaders, including London and Stockholm. Many cities/countries are seriously considering congestion charging, including the use of next-generation GPS-based solutions, especially for trucks. Greater demand for public transport interoperability at the metropolitan, regional and national levels.

North America
- The private car is the key mode of transport in most U.S. cities. However, the high cost of congestion (time and gallons wasted) is measured in the billions.
- Issues include significant funding challenges for new infrastructure, maintenance of existing infrastructure and achieving quality service levels. An overhaul of the gas tax is being considered with higher rates and user charges being introduced. The new administration is encouraging railways and public transport improvements while new approaches in tolling are being explored [3].

However, we have some of challenge to achievement previous benefits in this paper we will discuss the development of challenge from beginning of the millennium until 2012.

II. Challenge of intelligent transportation system

Infrastructure to 2030 telecom had proven that the changing geography of infrastructure and The growing internationalization of the economy and its impact on infrastructures where The challenges arise first of all from the fact that demand patterns for infrastructure services will change between and across countries as well as within countries. At the same time, the nature of infrastructure is likely to change as technology and user requirements evolve. Finally, financing the maintenance of existing infrastructure and deploying new ones, as well as managing change in a holistic manner across separate albeit interrelated facilities, will raise challenges of their own [4].

- At 2002 Kirikova et aI, [5] reduced the challenge his implies that there is a need of knowledge development in these areas, but most of all there is a need for people who are able to integrate knowledge from these areas. There are specialists in GIS, transport modeling and information systems development but few people who are able to integrate Knowledge from different areas. This is a major problem because knowledge and systems integration will be a key factor in order to develop ITS and he ignore some effective criteria for example IBM Institute for Business Value based on a number of factors, including the city's stage of development, physical characteristics, existing levels of transport infrastructure and citizen preferences For example, Amsterdam and Chicago are both mature cities but have very different characteristics that will shape their transport ambitions: in Amsterdam, over 50 Percent of daily trips are on foot or on bicycle, whereas in Chicago, just under 90 percent are by private car [4].
- On the other hand Dr. Tom V. Mathew, summarize the problem and solution ITS at the table which compare between problem and possible solution and approach of ITS.

Table 1 : Relationship between problems, conventional approach and ITS approach

Problem	Possible solutions	Conventional approach ITS	ITS approach
Lack of mobility and accessibility	Provide user friendly access to quality transportation services	Expand fixed route transit and Para transit service Radio and TV traffic reports	Multi-modal pre trip and en-route traveler information Personalize public transportation Enhance fare card
Traffic congestion	Increase roadway capacity Reduce demand	New roads Car pooling Flex-time program	Advanced traffic control, advanced Real time vehicle systems Real time ride matching Personalized public transport Telecommuting transportation pricing

At same way Dr. Tom V. Mathew interest with User services and their requirements where:
A number of functions are needed to accomplish the user services. These functional statements are called user services requirements. For all the user services the requirements have been specified. If any new function is added, new requirements are to be defined. Table1 shows an illustration of user service requirements for traffic control user service.
Traffic Control (TC) provides the capability to efficiently manage the movement of traffic on streets and highways. There functions are provided as follows:

1. Traffic Flow Optimization.
This will also include control of network signal systems with integration of freeway control. The specified user service requirements TC shall include a Traffic Flow Optimization function to provide the capability to optimize traffic flow.
- Traffic Flow Optimization shall employ control strategies that seek to maximize traffic-movement efficiency.

- Traffic Flow Optimization shall include a wide area optimization capability, to include several jurisdictions.
- Wide area optimization shall integrate the control of network signal systems with the control of freeways.
- Wide area optimization shall include features that provide preferential treatment for transit vehicles.

2. Traffic Surveillance, Control and Provide Information.

TC shall include a Traffic Surveillance function [6]. On the other hand Paul Alvarado discus the driving work domain is a complex environment. When designing for complex and safety critical environments there is a greater responsibility for the designer. They need to attain a deeper understanding of the work domain and activities surrounding the usage of these systems [7]. In the driving work domain the critical aspect is the driver's collective behavior with the traffic environment and includes constraints that are both physical and intentional [8]

III. Conclusion

At this survey we attempt to show the ITS applications can play an important role for transport, particularly in big cities and how at last ten years ITS have Challenges dependent on knowledge of citizen manners and geographic places.Future direction of search we not after some paper search design of ITS have some of change from city to other according of some criteria so we attempt to generate frame work to integrate dynamic requirement (a Model-Driven Requirements) [9] , and how system generate solution according to changing of requirement we can to this by some of stops
- classify our criteria
- Give weight for criteria (ANN)
- Design hidden layer for predicate manner of citizen
- Give actors OS system ability of interact with design of system by supervisor of developer
- We can use HCI for deal with multi agent of system and integrated this in design
- Ability of Validity for the design of system by create   online proto type of system
- Give feedback to the model Control, and Provide information, Analyze feedback and integrate the result as new requirement.

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