A

SEMINAR REPORT

ON

"INTELLIGENT TRANSPORT SYSTEM"

Submitted in partial fulfillment of the requirement for the award of degree
Of Civil

SUBMITTED TO: **SUBMITTED BY:**

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Acknowledgement

I would like to thank respected Mr…….. and Mr. ……..for giving me such a wonderful opportunity to expand my knowledge for my own branch and giving me guidelines to present a seminar report. It helped me a lot to realize of what we study for.

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Preface

I have made this report file on the topic **BURJ KHALIFA;** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to …………..who assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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ABSTRACT

"Future of transportation infrastructure"

There are many technologies involved in intelligent transportation system,

- Wireless communications
- Computational technologies
- Floating car data/floating cellular data
- Sensing technologies
- Inductive loop detection
- Video vehicle detection

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Intelligent transportation system i.e. ITS has wide range of applications as,

- Electronic toll collection
- Emergency vehicle notification systems
- Cordon zones with congestion pricing
- Automatic road enforcement
- Collision avoidance systems
- Dynamic Traffic Light Sequence
- Intelligent Vehicle

A broad range of diverse technologies, known collectively as intelligent transportation systems (ITS), holds the answer to many of our transportation problems. ITS is comprised of a number of technologies, including information processing, communications, control, sand electronics. Joining these technologies to our transportation system will save lives, save time, and save money.

1. Background:

Intelligent Transportation Systems help meet the transportation challenges:

A broad range of diverse technologies, known collectively as intelligent transportation systems (ITS), holds the answer to many of our transportation problems. ITS is comprised of a number of technologies, including information processing, communications, control, sand electronics. Joining these technologies to our transportation system will save lives, save time, and save money.

The future of ITS is promising. Yet, ITS itself, is anything but futuristic. Already, real systems, products and services are at work throughout the world. Still, the wide-scale development and deployment of these technologies represents a true revolution in the way we, as a nation, think about transportation. While many aspects of our lives have been made more pleasant and productive through the use of advanced technologies, we have somehow been content to endure a transportation system whose primary controlling technology is the four-way traffic signal -- a technology that has changed little since it was first invented. It has taken transportation a long time to catch on, but now the industry is sprinting to catch up.

Fulfilling the need for a national system that is both economically sound and environmentally efficient requires a new way of looking at -- and solving -- our transportation problems. The decades-old panacea of simply pouring more and more concrete neither solves our transportation problems, nor meets the broad vision of an efficient transportation system.

Traffic accidents and congestion take a heavy toll on lives, productivity, and wastes energy. ITS enables people and goods to move more safely and efficiently through a state-of-the-art, intermodal transportation system.

Interest in ITS comes from the problems caused by traffic congestion and a synergy of new information technology for simulation, real-time control, and communications networks. Traffic congestion has been increasing worldwide as a result of increased motorization, urbanization, population growth, and changes in population density. Congestion reduces efficiency of transportation infrastructure and increases travel time, air pollution, and fuel consumption.

The United States, for example, saw large increases in both motorization and urbanization starting in the 1920s that led to migration of the population from the sparsely populated rural areas and the densely packed urban areas into suburbs. The industrial economy replaced the agricultural economy, leading the population to move from rural locations into urban centers. At the same time, motorization was causing cities to expand because motorized transportation could not support the population density that the existing mass transit systems could. Suburbs provided a reasonable compromise between population density and access to a wide variety of employment, goods, and services that were available in the more densely populated urban centers. Further, suburban infrastructure could be built quickly, supporting a rapid transition from a rural/agricultural economy to an industrial/urban economy.

Recent governmental activity in the area of ITS – specifically in the United States – is further motivated by the perceived need for homeland security. Many of the proposed ITS systems also involve surveillance of the roadways, which is a priority of homeland security. Funding of many systems comes either directly through homeland security organizations or with their approval. Further, ITS can play a role in the rapid mass evacuation of people in urban centers after large casualty events such as a result of a natural disaster or threat. Much of the infrastructure and planning involved with ITS parallels the need for homeland security systems.

In the developing world, the migration of people from rural to urbanized habitats has progressed differently. Many areas of the developing world have urbanized without significant motorization and the formation of suburbs. In areas like Santiago, Chile, a high population density is supported by a multimodal system of walking, bicycle transportation, motorcycles, buses, and trains. A small portion of the population can afford automobiles, but the automobiles greatly increase the congestion in these multimodal transportation systems. They also produce a considerable amount of air pollution, pose a significant safety risk, and exacerbate feelings of inequities in the society.

Other parts of the developing world, such as China, remain largely rural but are rapidly urbanizing and industrializing. In these areas a motorized infrastructure is being developed alongside motorization of the population. Great disparity of wealth means that only a fraction of the population can motorize, and therefore the highly dense multimodal transportation system for the poor is cross-cut by the highly motorized transportation system for the rich. The urban infrastructure is being rapidly developed, providing an opportunity to build new systems that incorporate ITS at early stages.

1.1 Indian scenario:

Urban Scenario

In India out of the total population of 1027 million as on 1st March, 2001, about 742 million live in rural areas and 285 million in urban areas.

The percentage decadal growth of population in rural and urban areas during the 1990-2000 decade was 17.9 and 31.2 percent respectively.

The Ministry of Urban Development is in the process of framing a National Urban Transport Policy (NUTP) to address the various issues involved in urban transport.

The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities.

This is sought to be achieved by incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement; bringing about a more equitable allocation of road space - with people, rather than vehicles, as its main focus; investing in transport systems that encourage greater use of public transport and non-motorized modes instead of personal motor vehicles; reducing pollution levels through changes in traveling practices, better enforcement, stricter norms, technological improvements; building capacity (institutional and manpower) to plan for sustainable urban transport; and promoting the use of cleaner technologies.

According to the 2001 census, there are 35 metropolitan cities with million plus population. There are eight cities in the country with more than 3 million population, which include Delhi, Mumbai, Hyderabad, Bangalore and Kolkata. **A**mong all the States and Union territories, the National Capital Territory of Delhi is most urbanized with 93 percent urban population and will be hosting the 2010 Commonwealth Games, which is expected to give a big boost to ITS technologies and services.

Rural scenario

Out of the total 3.3 million km road network in India, approximately 80 % are in rural areas.

Upgradation of about 3,70,000 km Rural Roads is estimated at a cost of Rs.53, 000 Crore (one crore = 10 million). Cost of New Connectivity is estimated at Rs. 79,000 crore.The total envisaged cost of the project is about Rs.1,32,000 crore.

As part of the Indian Government's commitment to develop rural connectivity, the massive Prime Minister's Grameena Sadak Yojana (Prime Minister's Rural Roads Programme) was launched on 25th December, 2000 to provide all-weather access to unconnected habitations.

The PMGSY is a 100% Centrally Sponsored Scheme with 50% of the Cess on High Speed Diesel (HSD) earmarked for this Programme.

Combined with other rural infrastructure, e-governance, electrification and telecommunication programmes, ITS opportunities for rural roads in India has great potential.

Some statistics:

Under the 2005-06 budget

• Rs 450 crores special package has been set aside for the North Eastern region

• Rural infrastructure development fund: A corpus of Rs 8000 crores in 2005-06

• Telecommunications: A provision of Rs.1,200 crore for Universal Service Obligation (USO) Fund in 2005-06; 1,687 subdivisions to get support for rural household telephones; BSNL to provide public telephones in the next three years to the remaining 66,822 revenue villages.

• Rural Electrification: To cover 1.25 lakh villages in five years; focus to be on deficient States; creation of a rural electricity distribution backbone envisaged, with a 33/11 KV substation in each block and at least one distribution transformer in each village; Rs.1,100 crore provided in 2005-06.

2. Intelligent transportation technologies:

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.

2.1 WIRELESS COMMUNICATIONS:

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 WiMAX (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.

2.2 Computational technologies:

Recent advances in vehicle electronics have led to a move toward fewer, more capable computer processors on a vehicle. A typical vehicle in the early 2000s would have between 20 and 100 individual networked microcontroller/Programmable logic controller modules with non-real-time operating systems. The current trend is toward fewer, more costly microprocessor modules with hardware memory management and Real-Time Operating Systems. The new embedded system platforms allow for more sophisticated software applications to be implemented, including model-based process control, artificial intelligence, and ubiquitous computing. Perhaps the most important of these for Intelligent Transportation Systems is artificial intelligence.

2.3 Floating car data/floating cellular data:

Virtually every car contains one or more mobile phones. These mobile phones routinely transmit their location information to the network – even when no voice connection is established. This allows them to be used as anonymous traffic probes. As the car moves, so does the signal of the mobile phone. By measuring and analyzing triangulation network data – in an anonymous format – the data is converted into accurate traffic flow information. With more congestion, there are more cars, more phones, and thus, more probes. In metropolitan areas, the distance between antennas is shorter and, thus, accuracy increases. No infrastructure needs to be built along the road; only the mobile phone network is leveraged. Floating car data technology provides great advantages over existing methods of traffic measurement:

- much less expensive than sensors or cameras
- more coverage: all locations and streets
- faster to set up (no work zones) and less maintenance
- works in all weather conditions, including heavy rain

2.4 Sensing technologies:

Technological advances in telecommunications and information technology coupled with state-of-the-art microchip, RFID, and inexpensive intelligent beacon sensing technologies have enhanced the technical capabilities that will facilitate motorist safety benefits for Intelligent transportation systems globally. Sensing systems for ITS are vehicle and infrastructure based networked systems, e.g., Intelligent vehicle technologies. Infrastructure sensors are indestructible (such as in-road reflectors) devices that are installed or embedded on the road, or surrounding the road (buildings, posts, and signs for example) as required and may be manually disseminated during preventive road construction maintenance or by sensor injection machinery for rapid deployment of the embedded radio frequency powered (or RFID) in-ground road sensors. Vehicle-sensing systems include deployment of infrastructure-to-vehicle and vehicle-to-infrastructure electronic beacons for identification communications and may also employ the benefits of CCTV automatic number plate recognition technology at desired intervals in order to increase sustained monitoring of suspect vehicles operating in critical zones.

2.5 INDUCTIVE LOOP DETECTION:

Inductive loops can be placed in a roadbed to detect vehicles as they pass over the loop by measuring the vehicle's magnetic field. The simplest detectors simply count the number of vehicles during a unit of time (typically 60 seconds in the United States) that pass over the loop, while more sophisticated sensors estimate the speed, length, and weight of vehicles and the distance between them. Loops can be placed in a single lane or across multiple lanes, and they work with very slow or stopped vehicles as well as vehicles moving at high-speed.

2.6 VIDEO VEHICLE DETECTION:

Traffic flow measurement and automatic incident detection using video cameras is another form of vehicle detection. Since video detection systems such as those used in automatic number plate recognition do not involve installing any components directly into the road surface or roadbed, this type of system is known as a "non-intrusive" method of traffic detection. Video from black-and-white or color cameras is fed into processors that analyze the changing characteristics of the video image as vehicles pass. The cameras are typically mounted on poles or structures above or adjacent to the roadway. Most video detection systems require some initial configuration to "teach" the processor the baseline background image. This usually involves inputting known measurements such as the distance between lane lines or the height of the camera above the roadway. A single video detection processor can detect traffic simultaneously from one to eight cameras, depending on the brand and model. The typical output from a video detection system is lane-by-lane vehicle speeds, counts, and lane occupancy readings. Some systems provide additional outputs including gap, headway, stopped-vehicle detection, and wrong-way vehicle alarms.

3. Intelligent transportation applications:

3.1 ELECTRONIC TOLL COLLECTION

Electronic toll collection at "*Costanera Norte*" Freeway, downtown Santiago, Chile

Main article: Electronic toll collection

Electronic toll collection (ETC) makes it possible for vehicles to drive through toll gates at traffic speed, reducing congestion at toll plazas and automating toll collection. Originally ETC systems were used to automate toll collection, but more recent innovations have used ETC to enforce congestion pricing through cordon zones in city centers and ETC lanes.

Until recent years, most ETC systems were based on using radio devices in vehicles that would use proprietary protocols to identify a vehicle as it passed under a gantry over the roadway. More recently there has been a move to standardize ETC protocols around the Dedicated Short Range Communications protocol that has been promoted for vehicle safety by the Intelligent Transportation Society of America, ERTICO and ITS Japan.

While communication frequencies and standards do differ around the world, there has been a broad push toward vehicle infrastructure integration around the 5.9 GHz frequency (802.11.x WAVE).

Via its National Electronic Tolling Committee representing all jurisdictions and toll road operators, ITS Australia also facilitated interoperability of toll tags in Australia for the multi-lane free flow tolls roads.

Other systems that have been used include barcode stickers, license plate recognition, infrared communication systems, and Radio Frequency Identification Tags (see M6 Toll tag).

3.2 EMERGENCY VEHICLE NOTIFICATION SYSTEMS

The in-vehicle eCall is an emergency call generated either manually by the vehicle occupants or automatically via activation of in-vehicle sensors after an accident. When activated, the in-vehicle eCall device will establish an emergency call carrying both voice and data directly to the nearest emergency point (normally the nearest E1-1-2 Public-safety answering point, PSAP). The voice call enables the vehicle occupant to communicate with the trained eCall operator. At the same time, a minimum set of data will be sent to the eCall operator receiving the voice call.

The minimum set of data contains information about the incident, including time, precise location, the direction the vehicle was traveling, and vehicle identification. The pan-European eCall aims to be operative for all new type-approved vehicles as a standard option. Depending on the manufacturer of the eCall system, it could be mobile phone based (Bluetooth connection to an in-vehicle interface), an integrated eCall device, or a functionality of a broader system like navigation, Telematics device, or tolling device. eCall is expected to be offered, at earliest, by the end of 2010, pending standardization by the European Telecommunications Standards Institute and commitment from large EU member states such as France and the United Kingdom.

Congestion pricing gantry at North Bridge Road, Singapore.

3.3 CORDON ZONES WITH CONGESTION PRICING

Cordon zones have been implemented in Singapore, Stockholm, and London, where a congestion charge or fee is collected from vehicles entering a congested city center. This fee or toll is charged automatically using electronic toll collection or automatic number plate recognition, since stopping the users at conventional toll booths would cause long queues, long delays, and even gridlock. The main objective of this charge is to reduce traffic congestion within the cordon area.

3.4 AUTOMATIC ROAD ENFORCEMENT

Automatic speed enforcement gantry or "*Lombada Eletrônica*" with ground sensors at Brasilia, D.F.

A traffic enforcement camera system, consisting of a camera and a vehicle-monitoring device, is used to detect and identify vehicles disobeying a speed limit or some other road legal requirement and automatically ticket offenders based on the license plate number. Traffic tickets are sent by mail. Applications include:

- Speed cameras that identify vehicles traveling over the legal speed limit. Many such devices use radar to detect a vehicle's speed or electromagnetic loops buried in each lane of the road.
- Red light cameras that detect vehicles that cross a stop line or designated stopping place while a red traffic light is showing.
- Bus lane cameras that identify vehicles traveling in lanes reserved for buses. In some jurisdictions, bus lanes can also be used by taxis or vehicles engaged in car pooling.
- Level crossing cameras that identify vehicles crossing railways at grade illegally.
- Double white line cameras that identify vehicles crossing these lines.
- High-occupancy vehicle lane cameras for that identify vehicles violating HOV requirements.
- Turn cameras at intersections where specific turns are prohibited on red. This type of camera is mostly used in cities or heavy populated areas.

3.5 Collision Avoidance Systems

Japan has installed sensors on its highways to notify motorists that a car is stalled ahead.

3.6 Dynamic Traffic Light Sequence

Intelligent RFID traffic control has been developed for dynamic traffic light sequence. It has circumvented or avoided the problems that usually arise with systems such as those, which use image processing and beam interruption techniques. RFID technology with appropriate algorithm and data base were applied to a multi vehicle, multi lane and multi road junction area to provide an efficient time management scheme. A dynamic time schedule was worked out for the passage of each column. The simulation has shown that, the dynamic sequence algorithm has the ability to intelligently adjust itself even with the presence of some extreme cases. The real time operation of the system able to emulate the judgment of a traffic policeman on duty, by considering the number of vehicles in each column and the routing proprieties.

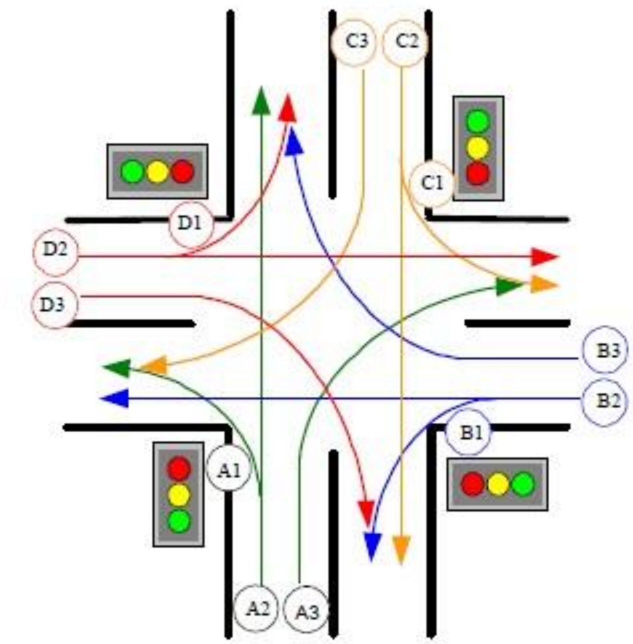
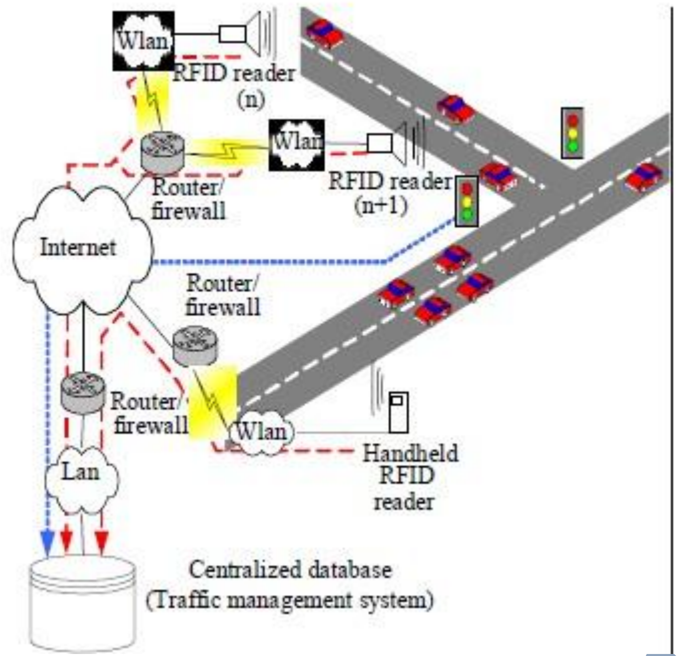


Fig. 2: Multilane traffic sequence flow

Dynamic Traffic Light Sequence Algorithm Using RFID

The operation of standard traffic lights which are currently deployed in many junctions, are based on predetermined timing schemes, which are fixed during the installation and remain until further resetting. The timing is no more than a default setup to control what may be considered as normal traffic. Although every road junction by necessity requires different traffic light timing setup, many existing systems operate with an over-simplified sequence. This has instigated various ideas and scenarios to solve the traffic problem. To design an intelligent and efficient traffic control system, a number of parameters that represent the status of the road conditions must be identified and taken into consideration. Most of the present intelligent traffic lights are sensor based with a certain algorithm that controls the switching operation of the system[1,2]. This approach considers the traffic to be moving smoothly and hence does not require any management or monitoring of traffic conditions. When some unpredictable situation develops, or when congestion occurs, there is no proper way of dealing with such development. A more elaborate approach has been introduced to overcome these problems. It employs real-time traffic flow monitoring with image tracking systems[3,4].



Although this method can give a quantitative description of traffic flow[5], it involves several limitations. The processing in real time on a large scale may present prohibitive requirements. Some common problems involved in image processing system include False Acceptance Rate (FAR) and False Rejection Rate (FRR). Normally, in case of jam-packed traffic, the computer vision results in erroneous detection[3].The sensor based traffic light control on the other hand may require sensors that operate with a line of sight detection, which may present difficulty in detecting vehicles that pass through blind spots detection range.

CONCLUSION:

The RFID technology may lead to a revolution in traffic management, when it is properly deployed as an intelligent system with suitable algorithm. One of its main features is the ability to communicate operation commands from head-quarters or any other subsidiary command station to any location in the system via existing infrastructure such as GSM or Internet. This system can enhance the transportation system of the country, by efficient management. The dynamic management scheme operates in real-time and emulates the judgment of a traffic policeman on duty. The efficiency of the system may save many man-hours usually lost in traffic problems. Accidents may also be prevented and lives can be saved as well as property. Priority emergency tags can be deployed on ambulance, fire, police and other emergency vehicles. The system saves valuable details in the records of the database, which can provides ample and valuable information to planners and investigators. However, the integration of the databases among the local authorities is a challenge that requires decisions at national level. Data sharing and secure hierarchical access to various levels of databases and protocols must be designed to integrate new information with existing systems. The issues of integration and collaboration may be a subject for future work. The legal issues and privacy laws relating to the monitoring of drivers all the time may cause a major public concern. Such study would need to address subjects relating to civil rights and personal freedom issues as well as social acceptance.

3.7 Intelligent Vehicles:

The Intelligent vehicle initiative

Where the metropolitan, Commercial vehicle and Rural program areas are focused primarily on the ITS infrastructure, the intelligent vehicle initiative aims to accelerate the development and availability of advanced safety and information systems applied to all types of vehicles. The goal is to integrate driver assistance and motorist information function so that vehicles operate more safely and effectively.

The intelligent vehicle initiative covers applications for passenger vehicles, commercial trucks, buses and specialized vehicles such as snowplows. Other special application to emergency response, law enforcement and highway maintenance vehicle are also included.

Many of these applications are based on ongoing and recently completed research on crash avoidance, in vehicle safety and automated highway systems. Continuing research on human factor, and advanced driver warning and vehicle control systems are a major thrust of the intelligent vehicle initiative.

This initiative seeks to bring together public and private stakeholders to ensure that in-vehicle systems are technologically, socially, institutionally and economically viable.

Partnership with the motor vehicle industry and its suppliers, states, government organizations, academic institutions and other interested parties are being aggressively pursued.

- ***THE BENEFITS***

  ✵In-vehicle devices addressing lane-change, rear end and roadway-departure crashes are estimated to offset crashes per year.
  ✵In Urban areas, crashes could be prevented annually by advanced lane-keeping and collision-avoidance technologies.
  ✵Enhancements in night time and bad weather vision applications may significantly improve driver's ability to stay in lanes and distinguish hazards in the road.

4. ITS World Congress and Exhibition 2009:

The World Congress and Exhibition on Intelligent Transport Systems and Services, takes place in Stockholm, Sweden in September 2009. The 16th annual event, which rotates between Europe, the Americas and the Asia-Pacific region, comes to Sweden for the first time and takes place at Stockholm International Fairs (Stockholmsmässan), from 21st - 25th September 2009. The theme of this prestigious event is 'ITS in Daily Life', exploring how ITS can improve everyday mobility with strong emphasis on co-modality.

ITS World Congresses gather some 5,000 participants from around the world looking to share experiences and build networks. As a decision-maker, manufacturer, supplier or consultant within the private or public sector, the World Congress is an opportunity for you to learn more about what ITS can do to improve the efficiency of your operations. What's more, it is an excellent opportunity to show the general public how ITS can help them in their daily lives. There will also be an opportunity for the public to visit the Exhibition and demonstration sites on the last day of the World Congress in Stockholm. The ITS World Congress 2009 in Stockholm will provide an
excellent opportunity to exhibit international ITS solutions, both private and public, to a committed and influential international audience. With the theme "ITS in Daily Life", the Congress will explore how ITS can improve our everyday mobility with a

strong emphasis on co-modality and ITS solutions for all transport modes. This multi-modal theme will also be reflected in the Exhibition where various commercial exhibitors, public administrations and ITS related organisations will showcase their technologies and services that are changing the face of transport today.

The Congress will focus on the benefits of ITS for transport and traffic managers, drivers, and travelers. It will explore how ITS addresses societal challenges and the environment, how to accelerate ITS deployment and investment in ITS infrastructure. Stakeholders from around the globe will be able to exchange knowledge and generate further development, as well as exhibit their innovative ITS solutions. The Exhibition will also be opened to the general public on the last day to show them how ITS can help them in their daily life.

4.1 Some issues of discussion and study

1. Future transport – a multimodal challenge: ITS solutions ensuring environmentally friendly transport:

There is an increasing understanding globally that mobility and transport must be delivered with long-term responsibility for the environment and climate. The world financial crisis is an extra dimension increasing the pressure for measures to be efficient and effective. Transport development so far has tended to be for each mode of transport to act for itself in competition with other modes, seeking to gain market share and a more prominent place in the national and the international markets. It is now legitimate to question this and ask whether competition among the modes should not end so that freight shipment or passenger trips can be brought into focus from a customer perspective with the long-term responsibility for the environment and climate. ITS is a key tool for such a change and it is paramount that the ITS solutions which emerge offer an overall multimodal transport benefit and that incentives for implementation are created both nationally and internationally. This Round Table will discuss what demands political leaders are likely to place on transport when defining the playing field for multimodal ITS solutions. The Round Table will also review what is needed for industry; what long-term incentives might be needed; whether rules will be needed to ensure success; and how to respond to current demands and future expectations

2. ITS for energy efficiency and climate change mitigation:

Across the world the green aspect of transport is becoming more and more a feature of public debate. ITS potentially has both direct and indirect positive impacts on the demand for transport, energy consumption and environmental externalities. It also has an important role to play in the deployment of alternative fuels and propulsion systems and promoting co-modal transport. However, significant results and quantitative data are still missing. At present, only a few systems specifically address environmental aspects. Tangible results are needed to support the wider deployment of these «**Green ITS**» services. This session will address current actions at an international political and strategic level to meet environmental requirements with ITS, including possible actions under the European Green Cars Initiative proposed as part of the European Economic Recovery Plan, the concept of Green Corridors as well as the Japanese and US initiatives on transport technologies.

3.Urban mobility:

Intelligent transport systems can improve traffic flow, safety and public transit in cities. They also enable informed choices by users. Deployment has been limited given the scale of urban mobility needs, including reduction of emissions and other environmental concerns. Moreover, some older traffic management and information systems are often not capable of integrating real-time information on congestion or traffic incidents. This session will review emerging urban mobility technologies and address the economic benefit of changes in the navigation, telematics and traffic control industries. It will also elaborate on how intelligent transportation technologies can support the needs for increased mobility as well as benefit the environment.

4.Driver distraction:

Driving along intricate networks of roadways with numerous inputs such as road signs, commercial advertisements, unpredictable pedestrians and other distractions has become a challenge for even the best drivers. Vehicle infotainment and communications systems present an array of functionalities that also potentially distract drivers. Older drivers are especially challenged by these operating conditions. While the driver may be cognitively limited in order to deal with these challenges, it may be possible to use technology to make the vehicle and infrastructure smarter. This includes reference to human factor concepts of safety and security, cognitive distraction, overdependence on such systems, and misunderstanding system functionalities. This session will focus on using ITS and human factors engineering principles to deal with driver distraction. The benefits and shortcomings of using these technologies as well as the political implications of potential deployment will be discussed.

5.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.

6.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.

7.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.

8.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.

9.World Bank and ITS infrastructure planning, implementation and evaluation in developing countries:

To plan, implement and evaluate ITS in developed countries is a challenging proposition, but these undertakings are even more daunting in developing countries, which present their own special set of issues. For example, there is often a lack of funds for ITS infrastructure investment and a lack of training of personnel to install, operate and maintain the equipment. Electronics equipment installed in the field is subject to theft by desperately poor people who sell the materials for scrap. Vehicles often have to share the road with

pedestrians, bicyclists, rickshaws, and animals. But the news isn't all bad. Developing countries have the 'latecomers' advantage' over developed countries because they can learn from the best practices and mistakes of those who have come before. Here the value of evaluation becomes clear as developing countries benefit from the objective
assessments of the past. In this session, speakers from developing countries from around the world will relate their experiences in planning for and deploying ITS infrastructure.

5. Reference:

www.google.com

www.wikipedia.org

www.studymafia.org