ISSUES AND CHALLENGES OF INTELLIGENT TRANSPORTATION SYSTEMS TO ROAD USERS IN MALAYSIA

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ABSTRACT

The research aim to discuss the issues and challenges of Intelligent Transportation Systems (ITS) to road users in Malaysia. ITS bring significant improvement in transportation system performance, including reduced congestion, increased safety and traveller convenience. The goal of intelligent transportation systems is to improve the effectiveness, efficiency, and safety of the transportation system. Effective deployment of ITS technologies depends in part on the knowledge of which technologies will most effectively address the issues of congestion and safety. Thus, it is important to understand the benefits of both existing and emerging technologies. This paper identifies the issues and challenges ITS to road users in Malaysia. Actually, ITS give many impact to road users and also to transportation system in Malaysia. In conclusion, Intelligent Transportation System (ITS) is a broad range of diverse technologies, including information processing, communications, control and electronics, which, when applied to the transportation system, can save time, money and lives. Besides that, ITS can be used to manage congestion in Malaysia, enhance safety and help road users to solve their problem such as congestion.

Keywords
Intelligent Transportation Systems (ITS), congestion, safety, benefits, challenges

1.0 INTRODUCTION

The term intelligent transportation system (ITS) describes the process of aiding control, monitoring and communications technology to transportation infrastructure and vehicles to improve safety, reduce energy consumption, and to reduce vehicle wear, and transportation time. Development and application of ITS technology is also driven by the need for homeland security, and many of the proposed ITS systems also involve surveillance of the roadways. Intelligent Transportation Systems (ITS) technologies advance transportation safety and mobility and enhance productivity by integrating advanced communications technologies into transportation infrastructure and into vehicles. ITS encompasses a broad range of wireless and traditional communications-based information and electronic technologies. Objective of this research is to investigate the issues and challenges of ITS based on issues of congestion and also about safety of the road users in Malaysia. Malaysia's rapid development since independence in 1957, has made Malaysia as one of the successful developing country. Transport is the heart of the development, especially to support economic development in where improvements in infrastructure and their country had resulted Malaysia to become a nation that have multiple "mobile society" or society ever moving. This can be seen from the hectic hours early in the morning that cause extreme traffic congestion, or when it's the festive season, when people flocked the city to return home. Malaysian society has now changed lifestyle which has its own vehicle and less dependent on the public transportation system. Because they feel these are more comfortable to move around using their own vehicles without having to wait or rely on public transportation. Modern lifestyle demand the usage of private vehicles. This situation has caused extreme traffic congestion. When congestion happen in Malaysia we need to use the best way method to solve it. Interest in ITS comes from the problems caused by traffic congestion and a synergy of a 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. Congestion reduces efficiency of transportation infrastructure and increases travel time, air pollution, and fuel consumption. The issues is about congestion and safety. Actually, ITS bring many benefit to our country. When our country use this systems it can reduced congestion and enhanced safety. The implementation of ITS also have many challenges in our country. This systems had been used since the beginning of 2005 in Malaysia. When this system used in Malaysia the cases of accident can reduce the rate of death from year to year and can control our road condition. Intelligent transport systems may be categorised several ways, referring either to the physical location of the system, the timing of the effects of the system, the means by which the system enhances safety, or the transport domain to which it is applied. One of the broadest and most common classifications with regards to the positioning of the system and whether system is in-vehicle, infrastructure-based or cooperative. In-vehicle actually these refer to technologies based within the vehicle. These typically involve sensors, information processors and on-board units or displays that provide additional information to the user, automate or intervene with some part of the driving task, or provide warnings to the user about potential hazards. Infrastructure-based is also may serve one of two general functions is to provide drivers with additional information via roadside messages, or to better manage and control traffic flow. In both instances, various types of sensors are used to gather information from the road environment and road side signs or signals are used to influence traffic behaviour. Cooperative is cooperative systems involve communication between vehicles and the infrastructure or between vehicles. This communication may be one way, where the vehicle receives information from the infrastructure but does not transmit information in return, or two-way where the vehicle both sends and receive information to another vehicle or infrastructure-based system. Intelligent Transport Systems (ITS) are not just future technology. ITS has been a feature of transportation for many years. The capabilities of traffic management systems have been developing for more than half a century. Equipment to assist drivers has been developed ever since the car was invented.

2.0 ISSUES AND CHALLENGES

2.1 Reduce Congestion

Congestion always happen in Malaysia and we need to solve it. One solution to the growing congestion problem is to build more transportation infrastructure. It required high cost to build new infrastructure in built-up areas. So developing countries around the world are looking for other alternatives to deal with this problem. One such alternative is a set of practices called Intelligent Transportation Systems (ITS). ITS is commonly understood to denote systems that combine recent advances in information and communication technologies to better manage the transport system. ITS comprises a wide range of tools for managing transportation networks as well as for providing services to travelers. One of the basic features of ITS is the collection of data and conversion of the data into information that can be used to fulfill a user need. Through ITS, transportation authorities, operators, and individual travelers are able to make more coordinated and intelligent decisions based on timely information. ITS has been widely implemented around the world, especially in high-income, developed countries. It has been used to reduce congestion by improving traffic flows on transportation networks, managing the demand, and diverting the demand for car travel to other modes of travel.

Another way to reduce congestion on the nation's interstates and highways is to improve the connectivity of local roads to offer multiple routes, rather than forcing local traffic onto the interstates and other major highways. When local decisions have a major impact on nationally important transportation corridors, Congress can help ensure that state and local governments are making decisions that preserve the federal investment, alleviate vehicular congestion, and extend the capacity of the nation's interstates and highways. Fortunately, for each of these elements, Intelligent Transport Systems (ITS) tools are available which can contribute to the objectives of realisation of additional capacity or reducing congestion. Many of the rural roadways typically experience non-recurrent congestion (congestion caused by incidents) challenges, while recreational attractions such as national parks, national monuments, or ski areas, have recurring congestion challenges at gate entrances and visitor site-specific locations. ITS may help to improve traffic flow in these areas. ITS also can help managing highways.

2.2 Increase Safety

Safety is very important to road user in Malaysia. One of the major goals of ITS is to improve safety and security. Many of these services are highly related to emergency response while other services provide hazardous conditions or site-specific safety related information, as discussed in this section. This type of information could assist in evacuation and disaster management plans, where timely information is critical. Also included are services such as remote surveillance and monitoring. These services could be implemented at park-and-ride lots, rest areas, etc. Information from these services can be used to implement roadway control strategies, such as emergency road closings or variable speed limits. Actually, safety or security very important for road user in Malaysia. Fortunately, for each of these elements, Intelligent Transport Systems (ITS) tools are available which can contribute to the objectives of realisation of additional capacity or improved safety.

2.3 Enhanced Vehicle Safety

Intelligent Transportation Systems (ITS) are state-of-the-art approaches based on information, communication and satellite technologies in mitigating traffic congestion, enhancing safety, and improving quality of environment (Shah and Lee, 2007). The term ITS refer to integrated applications, employing combinations of information, communications, computing, sensor and control technologies, which aim to improve transport safety and mobility and reduce vehicle emissions. Many such technologies have been developed to enhance vehicle safety to prevent crashes, reduce trauma during a crash or to reduce trauma following a crash. Intelligent Transport Systems (ITS) have significant potential to enhance traffic safety (Regan et al, 2001).

ITS technologies may provide vehicles with different types and levels of "intelligence" to complement the driver. Information systems expand the driver's knowledge of routes and locations. Warning systems, such as collision avoidance technologies, enhance the driver's ability to sense the surrounding environment. Driver assistance and automation technologies stimulate the driver's sensor motor system to operate a vehicle temporarily during emergencies or for prolonged periods. These technologies are being developed and marketed to increase driver safety, performance, and convenience (Bertozzi et al, 2002). In recent years, the intelligent vehicle system has emerged and became a popular topic among transportation researchers. However, the research of safety in vehicle is an important subset of intelligent vehicle system research. Meantime, active warning system is one of the designs on active safety system. The safety warning systems, mostly active warning systems for preventing traffic accidents have been attracting much public attention (Jian-Da and Tuo-Rung, 2008).

Nowadays, the focus of road safety has shifted from collision protection to prevention. Many new accident avoidance techniques have been proposed, ranging from lane detection mechanisms, traffic analysis vision systems, vehicular networks, and tiredness estimation systems (Reddy, 2007).

2.4 Ongoing Operation and Maintenance

ITS projects require not only initial capital costs for purchasing and installing the system. They also require ongoing costs for operation and maintenance. ITS applications involve a rapid evolution of advanced technologies, which affects the planning process in two-fold: on the one hand, it makes ITS performance more unpredictable than other traditional transportation strategies on the other hand, it is difficult to estimate the cost and benefit accurately for the whole ITS project. Actually, ITS very difficult to built it and need long time to run and accomplish it. Therefore, ongoing operation and maintenance becomes a very critical issue in the ITS planning process. Moreover, ITS applications usually involve various stakeholders, and each of them plays a different role. These stakeholders will be sensitive to the allocation of costs and benefits over the ITS technology's life cycle. No one wants to invest in an ITS system that will soon be obsolete. Similarly, no one wants to miss the opportunity to achieve great improvement from ITS technologies. How to share the risk and responsibility of the ongoing operation and maintenance between stakeholders becomes another essential issue. Because of its importance, it is not surprising that co-operators and partners in an ITS project will have disputes over the role of operation and maintenance, as happened between Fairfax County and VDOT in the TSP Project. Agencies should anticipate this challenge and prepare the costs associated with it in the planning process.

2.5 Human Resources

As a high technology, ITS is often not well understood and accepted by public officials and transportation planners. There is also sometimes a lack of technical expertise in local transportation agencies, especially small and rural ones, which may hinder the development of ITS in the long run. In the Real-Time Transit Information System Project, for example the City of Alexandria has expanded and leveraged its staff expertise through collaborating with other local agencies. Efficient institutional arrangements and cooperation may help make up for the lack of technical capacity within the agency.

2.6 Institutional and organizational barriers

Even though the technology now exists to deploy an integrated Metropolitan ITS, there are several institutional and organizational barriers that must be overcome before implementation can become reality. These are non-technological barriers that involve formal and informal relationships among people, governments, and private enterprise. They may present the most important and complex challenges. Organizational and managerial challenges include interagency coordination, intra agency support and coordination, developing new public private partnerships, and managing necessary operational tests. ITS has several ways to overcome these challenges and successfully deploy ITS in a metropolitan area. The creation of a regional management structure, including clear definition of agency roles and responsibilities, is key to the success of the ITS implementation. Actually, there are several possible structures. An Executive Committee, comprised of representatives from all participating jurisdictions/agencies, is common to most efforts. Depending upon the scope of the ITS deployment effort, a full-time Project Manager may be required. This individual is assigned responsibility for appropriate and timely communication, workload plans, flexible contracts between public and private partners, and evaluation of final results. An appropriate committee structure, one that creates separate committees for each of several technological and managerial areas required, will help to clearly identify appropriate lines of authority and facilitate coordination.

3.0 CONCLUSION

In conclusion, Intelligent Transport System (ITS) actually is an umbrella-term that incorporates virtually any system within the field of transportation that utilizes the latest developments from information technology, computer science, telecommunications and systems control. Besides that, ITS as an application of high technology and communication technologies to current freeway, traffic and transit systems in order to alleviate traffic congestion, improve travel flow, improve air quality and provide more efficient and safer transportation system. ITS give many benefits to road user, systems transportation and can solve many problem such as congestion, safety of the road, reduce rate of accident in Malaysia. This systems is still new in Malaysia and this systems more helping our systems transportation country more better, effective and efficient. In Malaysia have many problem about systems transportation which are not effective and efficient. On top of that, this system used in Malaysia to improve all problem in systems transportation.

Furthermore, as the country towards a developed nation, Malaysia must use this intelligent transportation system. This system is a solution to problems of congestion and traffic management. Therefore, development of navigation systems and information designed to address and fix the problem. In Malaysia, intelligent transportation systems, better known as ITS (Intelligent Transportation Systems) have started to progress. ITS consists of several categories according to use, for traffic management, information travel, commercial vehicle operations and public transport as well as control vehicle. Many of these systems can be implemented at minimal cost relative to the resulting benefits and have a tremendous impact on congestion and safety. ITS operations done to control costs, improve safety and maximizing infrastructure. Use of ITS can also reduce impact vehicle to the environment and to increase the use of transport public. Thus, many of the private sector, supported by the government has begun to take this technology from abroad for domestic consumption. It is estimated that Intelligent Transport Systems (ITS), particularly in-vehicle systems, have significant potential to enhance the safety of drivers and other road users. In addition, the scope of "ITS" is therefore a range of services provided within a number of application areas that can be loosely grouped together under the title "Intelligent Transport Systems".

Actually, Intelligent Transport Systems are those systems where vehicles interact with the environment, and with each other, to provide an enhanced driving or travelling experience, and where intelligent infrastructure involving ICT improves the safety and capacity of road systems. Intelligent Transport Systems do not have to be only about vehicles and roads. Air transport, marine transport, and rail transport systems can, and frequently are, increasingly "intelligent". Indeed, air and rail transport systems have used advanced system and electronics design as part of their operation and infrastructure for decades. Marine navigation systems for all but small vessels have also used electronics and radio for location finding, obstacle avoidance and collision avoidance, for a long time.

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