For information

Legislative Council Panel on Transport

Progress Update on the Intelligent Transport Systems

INTRODUCTION

This paper reports on the progress of the development and implementation of Intelligent Transport Systems in Hong Kong since March 2003.

BACKGROUND

2. According to the recommendations of the Intelligent Transport Systems (ITS) Strategy Review Study conducted by the Transport Department (TD) in 2000/01, a centralised Transport Information System and a more comprehensive Traffic Management Framework should be established to enhance traffic flow and safety of our road network. We updated Members on the progress in implementing the core projects recommended by the ITS Strategy Review in May 2002 and March 2003. Since then, the Administration has pressed ahead with the various initiatives.

3. In the wake of the serious traffic congestion on 9 May 2005, the Secretary for the Environment, Transport and Works appointed a Task Force to review and recommend measures to enhance emergency transport coordination. The Task Force has completed the review and made 56 recommendations. Those recommendations relating to ITS are listed in the **Annex**.

4. We have since reviewed our ITS strategy. The latest update on the various projects and our cooperation with the private sector on value-added services are set out in the ensuing paragraphs.

TRANSPORT INFORMATION SYSTEM

5. The Transport Information System (TIS) is a centralised data warehouse for the collection, processing and dissemination of comprehensive transport information. It will provide two key services, namely, an Intelligent Road Network (IRN) and Public Transport Information Service (PTIS).

6. IRN will provide up-to-date information on traffic directions, turning movements at road junctions and stopping restrictions, etc. Upon completion of the IRN, value-added service providers in the private sector, including telecommunication companies, fleet and freight operators, logistic and IT organisations, can make use of the information for the development of ITS applications such as car navigation, fleet management systems and personalised information services to the public.

7. PTIS is intended to be a service on the Internet providing transport and traffic information to public transport users and motorists for pre-trip planning. It will allow public transport passengers to search for their optimum routes based on distance, cost and number of interchanges. Motorists can search for their optimum driving routes on the digitised map based on options such as distance and toll.

8. The Administration awarded the contract for the implementation of the TIS in May 2003, and the project was originally scheduled for completion in December 2004. However, TD experienced difficulties with the contractor, which resulted in serious delay in implementation. The contract was eventually terminated in early February 2005.

9. TD is now arranging for the tendering of the new TIS contract. As recommended by the Task Force, a Geographical Information System platform is vital for the collection and dissemination of real-time traffic information and incident management. We thus plan to put in place the IRN as soon as possible. We aim to award the new contract in early 2006 for completion in late 2007.

10. In recent years, public transport operators, academic institutions and private sector have developed a number of products that provide services similar to PTIS. We are liaising with them to explore partnership opportunities and the best arrangements to implement PTIS in a timely and cost-effective manner.

TRAFFIC MANAGEMENT FRAMEWORK

11. Traffic Management Framework includes the Area Traffic Control (ATC) systems, traffic control and surveillance (TCS) facilities on strategic roads, a Journey Time Indication System (JTIS), and related traffic control centres.

ATC Systems

12. An ATC system is a computerised system that integrates the control and operation of traffic signals within a district having regard to changes in the traffic conditions. Through better management of the signalised junctions, the ATC system can maximise the use of road capacities and reduce journey time, delay and number of stops.

13. ATC systems are now in operation in the urban areas and the new towns of Tsuen Wan, Kwai Tsing, Sha Tin and Ma On Shan. We have been implementing a number of projects to expand the ATC system to other new towns and to replace the existing systems that will become obsolete soon.

14. The expansion of the ATC system to Tai Po and North Districts is scheduled for completion in October 2005. By then, more than 75% of the signalised junctions in Hong Kong will be controlled by ATC systems.

15. We have secured funding approval in June 2005 to expand the ATC system to Tuen Mun and Yuen Long. The construction works will commence in January 2006 and complete in October 2008. More than 90% of the signalised junctions will be covered by the ATC systems upon the completion of this project.

16. The renewal of the ATC system for Hong Kong Island has been progressing well and is scheduled for completion in June 2006. Our next target is to renew the Kowloon, Tsuen Wan and Sha Tin systems and to expand the ATC system to Tseung Kwan O. Subject to availability of funds, we aim to complete this project in 2010.

TCS Facilities on Strategic Roads

17. TCS facilities on strategic roads include Closed-circuit Television (CCTV) cameras, incident detectors, Variable Message Signs (VMS) and lane control signals. They enable TD to monitor traffic conditions, detect traffic incidents, provide motorists with important traffic information and divert traffic to improve traffic management.

18. The TCS facilities on the approach roads to Disneyland in Penny's Bay were completed in July 2005. We schedule to install such facilities on other major expressways including Hong Kong-Shenzhen Western Corridor, Deep Bay Link, Route 8 and Fanling/Tolo Highways between 2006 and 2009.

19. Apart from the areas covered by the ATC systems, we have also installed CCTV cameras on the strategic road network along Tuen Mun Road, West Kowloon Highway, North Lantau Highway, and the approach roads to the land boundary crossings, Kwai Chung Container Port and Tuen Mun River Trade Terminals. In 2004, new cameras along Tolo Highway between Ma Liu Shui and Tai Po came into operation. We will install additional CCTV cameras along Island Eastern Corridor, Yuen Long Highway, Tung Chung Road, Road T3 in Sha Tin and Route 9 Extension in Tsuen Wan by 2007 for better traffic management.

20. In response to the recommendations of the Task Force, we have conducted a review on the existing CCTV system and has identified the "blind spots", especially those along traffic sensitive and public transport sensitive routes. We plan to install about 70-80 additional cameras to enhance the coverage of the CCTV system at strategic locations. Separately, we will examine the feasibility of deploying mobile CCTVs to enhance information collection during traffic incidents. We also plan to install more VMS at strategic locations to facilitate dissemination of information.

JTIS

21. JTIS is designed to advise motorists of the estimated journey time for travelling from Hong Kong Island to Kowloon via the three cross-harbour tunnels. This system operates through tracking the position and general speed of a fleet of buses equipped with Global Positioning System, supplemented by video images captured by cameras at strategic locations. In 2003, we installed digital journey time indicators at Gloucester Road eastbound (near Revenue Tower), Canal Road Flyover northbound (near the exit of Aberdeen Tunnel) and Island Eastern Corridor westbound (near City Garden) to allow motorists to make an informed choice on the route to be taken based on the latest traffic situation. They are operating satisfactorily.

22. Apart from the digital indicators, TD has recently launched a Traffic Speed Map on the Internet for the approach roads on Hong Kong Island to the three cross-harbour tunnels, so that commuters can better plan their route before embarking on the journey.

23. We plan to expand the JTIS system to the Kowloon approaches to the Cross-Harbour Tunnel, e.g. Gascoigne Road, Chatham Road North, Princess Margaret Road, etc, to provide more information to motorists.

Traffic Control Centre (TCC) and Traffic Management and Information Centre (TMIC)

24. The Traffic Control Centre (TCC) at TD's Headquarters was commissioned in August 2003. The TCC accommodates the Emergency Transport Coordination Centre (ETCC) and the ATC and CCTV systems for the New Territories. The ATC systems for Hong Kong Island and Kowloon are accommodated in other Government offices.

25. We originally proposed to set up a TMIC that would have direct control of all the ATC systems and TCS facilities and would provide real-time traffic information to the media and the public via the TIS. Taking advantage of the latest communication technology and in light of TD's experience in operating the TCC, we have revised our plan for the TMIC project. Instead of accommodating all the traffic control facilities in a single TMIC, our current plan is to have two separate centres, viz. an enhanced ETCC and an Area Traffic Control Centre (ATCC), with distinct functions.

26. The enhanced ETCC is transformed from the existing TCC. It will specialise in handling emergency transport incidents, including disseminating incident information. The ATCC will accommodate and control the day-to-day operation of all the traffic control facilities in the territory. The facilities of the two centres will be interconnected to maximise their respective functions. The two-centre arrangement also enables one centre to serve as a back-up for the other, if and when the operation of either one is disabled due to emergencies or disasters, e.g. fire, sabotage, etc.

VALUE-ADDED ITS SERVICES

27. Real-time information on traffic conditions assists motorists in making pre-trip planning so that they can avoid travelling to congested areas, thereby enhancing the utilisation of the road network and facilitating smooth vehicular movement.

28. At present, the traffic images captured by CCTV cameras at strategic locations are provided to television stations for broadcast and are uploaded onto the Internet for free access by road users. We have increased the number of CCTV images available on TD's homepage from 43 in 1999 to 117 in 2004. We are also discussing with telecommunication service providers arrangements to broadcast real-time traffic information captured by the CCTV system to mobile phone users.

29. To improve information dissemination to commuters on the road, TD has launched a PDA version of its new homepage to allow public to browse special traffic news, transport services and tunnel traffic conditions on PDAs. TD is also examining the arrangements to provide real-time special traffic news in WAP format to mobile phones users.

OTHER ITS SYSTEMS/TECHNOLOGIES

30. Apart from the systems and technologies mentioned in the paragraphs above, the Task Force on Emergency Transport Coordination has also recommended the use of other advanced technologies to enhance inter-departmental communication and our incident management capabilities. Those technologies include –

(a) a computer-aided dispatch system for logging the conditions of the incident and the status of equipment and manpower dispatch;

(b) an expert-system-based incident management system for monitoring the incident and assisting to select and implement pre-programmed diversion plans; and

(c) Automatic Incident Detection technologies for detecting incidents effectively .

31. We will examine the operational, technical, legal and financial issues, as well as the availability and applicability of such technologies and their interface with the existing systems in the departments. Subject to the outcome of the study and availability of resources, we will develop an integrated incident management system for the collection, sharing and dissemination of traffic information.

ADVICE SOUGHT

32. Members are invited to note the contents of the paper.

Environment, Transport and Works Bureau
August 2005

Annex

Recommendations of the Task Force on Emergency Transport Coordination relating to Intelligent Transport Systems (ITS)

1. Explore the feasibility of using loop detectors underneath the roadway to collect real-time traffic data.

2. Improve the coverage of the Closed-Circuit Television (CCTV) system, especially along traffic sensitive or public transport sensitive routes.

3. Examine the feasibility of deploying mobile CCTVs to make the data collection process more effective.

4. Explore the feasibility of deploying a fleet of probe vehicles, probably buses and other public transport vehicles installed with Global Positioning System (GPS), to measure the network travel time and speed.

5. Examine the possibility of developing a system based on Geographical Information System (GIS) to display real-time traffic information in the form of a Traffic Speed or Queue Map for early detection of incidents and formulation of diversion and signal control plans and to inform the public of the traffic conditions of different roads.

6. Develop a shared real-time computer-aided dispatch system.

7. Explore the feasibility of developing a computerised expert-system-based incident management system to monitor incidents and help select and implement pre-programmed signal control strategies or diversion plans based on contingency scenarios and lessons learnt from past incidents.

8. Adjust the traffic signals through the Area Traffic Control system for effective queue management and dissipation.

9. Upgrade the facilities of the Emergency Transport Coordination Centre. In particular, procure computer systems with enhanced inter-departmental connectivity and geographical information system for monitoring the traffic conditions.

10. Update the ITS strategy and implement the recommendations as soon as possible.

11. Harness advanced technologies such as new CCTV system, Automatic Incident Detection technology, GPS and Traffic Control and Surveillance System to strengthen emergency handling capabilities subject to availability of resources.

12. Install Variable Message Signs (VMS) at strategic locations and junctions. Mobile VMS may also be deployed on the roads when fixed VMS are not available.