

For Discussion
18 December 2007

Legislative Council Panel on Transport

**Replacement of Conventional Traffic Signals
with Light Emitting Diode (LED) Traffic Signals in Hong Kong**

PURPOSE

This paper sets out our proposal to replace the conventional traffic signals with LED traffic signals.

BACKGROUND

2. Conventional traffic signals employ incandescent lamps. They are not energy-efficient, and the on-going energy charge contributes a high proportion of the operation cost.

3. Employment of LED lamps in traffic signals has become a global trend. LED lamps are known for their low power consumption and high energy efficiency. Compared with conventional traffic signals, LED traffic signals can generally save two-third of electricity consumption. LED traffic signals also have a longer design life. They normally have a lifetime of over ten years, compared with the one-year lifetime for conventional traffic signals. The adoption of LED traffic signals will generate savings in both operational and maintenance costs. It will also be beneficial from an environmental point of view, since LED traffic signals consume less energy and obviate the need for frequent disposal of incandescent lamp bulbs during preventive and corrective maintenance activities.

4. Transport Department (TD) has been monitoring the development of LED traffic signals since 2000. The quality of early LED products was unsatisfactory. Nevertheless, with gradual advancement in LED technology and intensive product development, there has been significant improvement in the quality of LED signals in recent years.

Some LED products in the market have proven to be compatible with our existing traffic signal equipment. Since 2004, TD has installed LED signals at about 150 junctions on a trial basis. All installed LED signals are operating satisfactorily.

5. TD has now identified two types of LED signal products as suitable for use in Hong Kong. With the continued development in LED technology and increasing interest of suppliers, TD anticipates that more LED products may be identified as suitable for use in Hong Kong in the next few years, resulting in an even more competitive market and lower price.

PROPOSAL

6. There are currently about 1,750 signalised road junctions in the territory of Hong Kong. Taking account of the anticipated growth and nominal wastage (e.g. due to traffic accidents), we propose to procure and install about 80,000 LED modules¹ at about 1900² junctions.

7. We plan to undertake the replacement project in three phases for the following reasons:

- (a) LED technology and reliability are improving gradually;
- (b) the price of electronics product including LED is on a downward trend; and
- (c) more LED signal products are expected to be developed/improved, and be able to meet TD's requirements in the next few years, rendering the tenders in phases two and three more competitive.

¹ Three LED modules are needed for one set of traffic signals and two LED modules for one set of traffic signals for pedestrians.

² This number has taken account of the anticipated growth of signalised junctions in Hong Kong.

8. The scope of the project comprises:
- (a) Phase 1 – Replacement of the traffic signals at about 400 junctions on the Hong Kong Island;
 - (b) Phase 2 – Replacement of the traffic signals at about 670 junctions in Kowloon;
 - (c) Phase 3 – Replacement of the traffic signals at about 830 junctions in the New Territories; and
 - (d) associated circuit board modification works required at existing traffic signal controllers which are originally designed to operate with the conventional signal lamps at each phase.
9. Subject to funding approval from the Legislative Council, we plan to commence the three phases of construction in September 2008, August 2009, and August 2010, and target for completion by October 2009, January 2011, and July 2012 respectively.
10. The traffic signal controller will need to be switched off for up to 30 minutes or so for the installation of the modified circuit boards. We will seek assistance from the Police to carry out manual traffic control during those periods. From our past experience, this would not cause significant traffic disruption.

FINANCIAL IMPLICATIONS

11. The project estimate is \$140 million, comprising \$32 million, \$50 million, and \$58 million for Phase 1, Phase 2, and Phase 3 respectively. The estimates are based on an assumption of a lower price of LED in Phase 2 and a further lower price in Phase 3.

WAY FORWARD

12. We plan to seek the endorsement of Public Works Subcommittee on 20 February 2008 for the approval of the Finance Committee on 25 April 2008.

ADVICE SOUGHT

13. Members are invited to comment on the proposal.

**Transport and Housing Bureau
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