

**For discussion
on 23 February 2004**

Legislative Council Panel on Economic Services

**Replacement of Doppler Very High Frequency Omni-Directional Range
and Distance Measuring Equipment at Tung Lung Island**

Introduction

This paper consults Members on the proposal of the Civil Aviation Department to replace the existing Doppler Very High Frequency Omni-Directional Range and Distance Measuring Equipment (referred to as DVOR/DME hereunder) at Tung Lung Island. The estimated non-recurrent cost is \$33.4 million.

Replacement of DVOR/DME

Background

2. The DVOR/DME is a long-range radio navigation aid providing essential navigation information for aircraft to/from Hong Kong. Currently, five facilities located at strategic positions in Hong Kong form the DVOR/DME network to provide coverage to the Hong Kong airspace and Flight Information Region. A map showing the five facilities is at **Annex**.

Annex

3. The DVOR/DME at Tung Lung Island has been in continuous service for more than 19 years. The equipment is aging and has become increasingly costly to maintain. Despite intensive maintenance, the fault rate of the DVOR/DME averaged at 14 occurrences per year between 2001 and 2003. It is expected that the fault rate will increase in the coming years, causing more outages of the DVOR/DME. Furthermore, since 1999 the equipment supplier of DVOR/DME has ceased the production of spare parts to support the system maintenance. To ensure reliability of the equipment and to reduce maintenance cost, there is an urgent need to replace the DVOR/DME.

Proposed Replacement DVOR/DME

4. The replacement DVOR/DME will incorporate the latest technologically advance processors to achieve more stable and reliable operation of the equipment. As opposed to the current design of having the antenna feeder cables and metallic antenna counterpoise embedded in concrete slabs, the new design will feature a surface-level equipment room, thus allowing easy access for maintenance.

5. Based on the latest market information, DGCA estimates that the replacement proposal would incur a non-recurrent cost of \$33.4 million (to be amortised over 15 years), broken down as follows –

	\$ million
(a) Equipment provision and installation ¹	13.7
(b) Building modification and building services works ²	14.6
(c) Flight calibration for system commissioning	0.8
(d) Technical work services by CAD maintenance contractor	1.3
Sub-total	30.4
(e) Contingency (10%)	3.0
Total	33.4

¹ Cost covers the replacement of the DVOR/DME system, the purchasing of the metallic antenna counterpoise, uninterruptible power supplies and initial spare parts, as well as expenses incurred in testing equipment, installation, commissioning and training for staff on equipment maintenance.

² Cost covers the refurbishment of a 60-metre diameter concrete slab for antenna counterpoise installation, construction of a new equipment room, replacement of the obsolescent power supply cables to the station, and the reprovision and renovation works on building services facilities.

Recurrent cost

6. The replacement DVOR/DME will be maintained by CAD's maintenance contractor and no additional staff is required for CAD. It is estimated that the spare parts and light and power consumption will cost \$1.48 million per annum. All recurrent costs arising from the proposed replacement will be absorbed within CAD's existing provision for the maintenance of its ATC equipment and facilities.

Implementation Plan

7. We plan to implement the proposal according to the following schedule –

Activity	Target completion date
Tender invitation	July 2004
Award of contract	February 2005
Station building modifications	January 2006
Equipment delivery	February 2006
Installation and commissioning	May 2006

8. It is expected that there would be a seven-month gap between decommissioning of the existing DVOR/DME and commissioning of the replacement equipment. During this period, CAD will use the facilities at Tathong Point and Cheung Chau to provide the navigation service. This is considered to be an acceptable interim measure for the short term without degrading the service or compromising flight safety.

Impact on Fees and Charges

9. The amortised project cost of the replacement will be recovered through the Air Traffic Control (ATC) and En-route Navigation Services Charges³. Taking 2006-07, i.e. the year in which the replacement equipment will commence operation, as an example and assuming that the ATC Services Charge will be shared by over 120,000 flights, the additional cost per flight is estimated to be around \$15, an increase of 0.3% compared to the current charge level. The additional En-route Navigation Service Charge will be \$4 per overflight, or an increase of 0.4%. We believe that the increase in charges will be insignificant vis-à-vis the total operating costs of airlines. The replaced equipment will improve flight safety and ATC efficiency, thus enhancing airlines' safe operation and the development of civil aviation in Hong Kong.

Consultation

10. The Aviation Advisory Board was consulted on 9 February 2004 and supported the proposal.

Way Forward

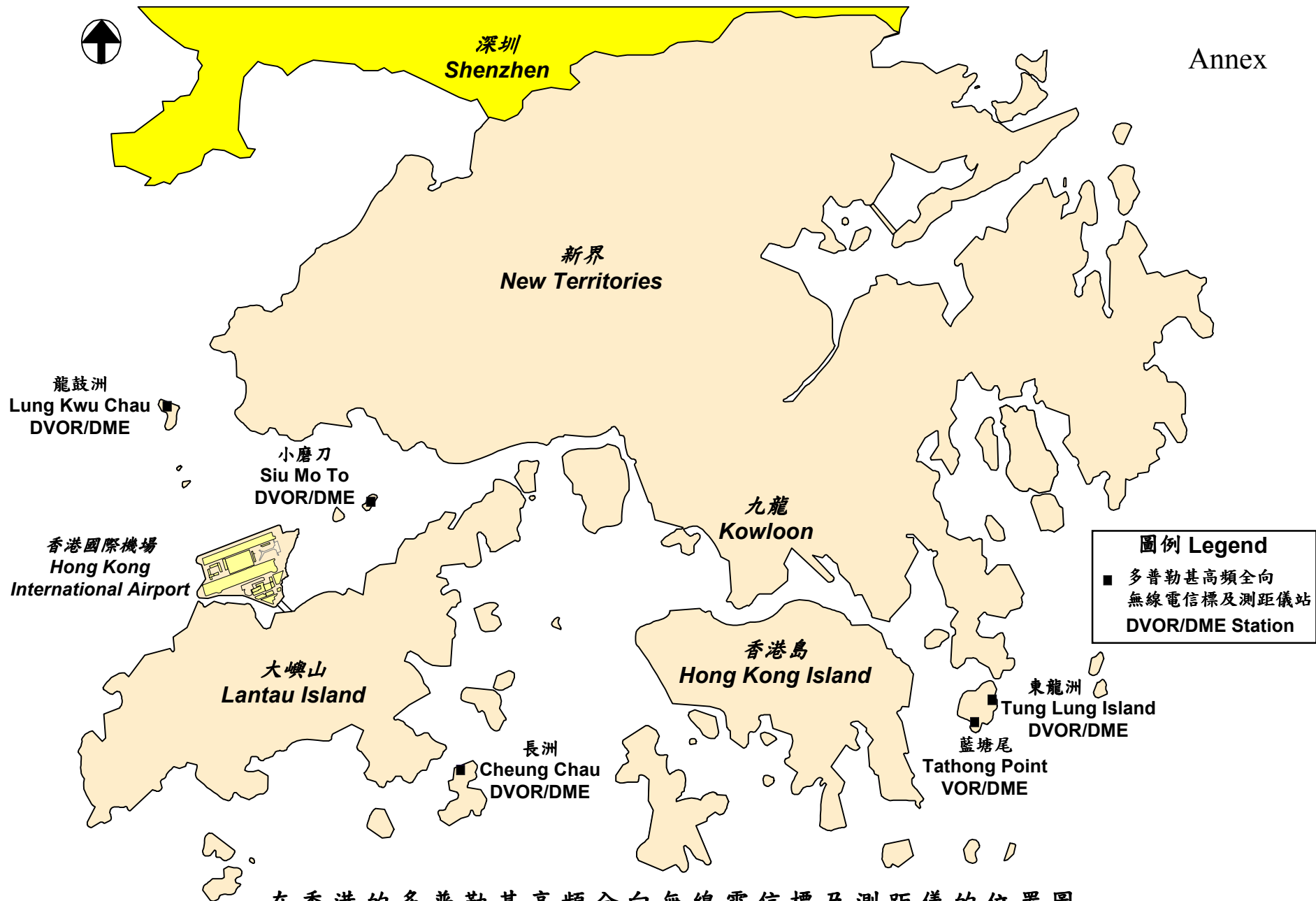
11. We plan to seek the approval of the Finance Committee on 30 April 2004 for the non-recurrent funding of the proposal.

Views Sought

12. We welcome Members' views on the proposal.

Civil Aviation Department
February 2004

³ ATC services are provided by CAD on a cost-recovery basis. ATC Services Charge (for aircraft landing at the Hong Kong International Airport (HKIA)) are recovered through the Airport Authority and En-route Navigation Services Charge (for overflying aircraft without landing at HKIA) are recovered from aircraft operators.



在香港的多普勒甚高頻全向無線電信標及測距儀的位置圖
**Location Map for Doppler Very High Frequency Omni-Directional Range
 and Distance Measuring Equipment (DVOR/DME) in Hong Kong**