

**For information**

**Legislative Council Panel on Transport  
Supplementary Information Paper on**

**Island Line Extensions, Route 7  
and South Hong Kong Island Line**

**INTRODUCTION**

At the meeting of the Legislative Council Panel on Transport held on 24 January 2003, Members were briefed on review findings on the development of the Island Line Extensions, Route 7 and the South Hong Kong Island Line (SIL) as set out in the Legislative Council Brief under Ref. ETWB(T) CR11/1016/99 and Members requested the Administration to provide the following supplementary information:

- (a) evaluation of the economic internal rate of return (EIRR) for SIL;
- (b) distribution of viaduct and tunnel sections of SIL; and
- (c) additional cost for the construction of the North Hong Kong Island Line (NIL) without the protection works.

**THE ADMINISTRATION'S RESPONSE**

**Methodology for the evaluation of EIRR**

2. The Internal Rate of Return (IRR) of a project refers to the annual discount rate which makes the total return from the project over its project life just equal to the total investment. The general formula is –

$$\sum_{i=0}^n \frac{B_i - C_i}{(1+r)^i} = 0$$

where

$r$	=	IRR
$i$	=	current year ( $i = 0$ for base year)
$B_i$	=	benefit accrued from the project in year $i$
$C_i$	=	cost incurred on the project in year $i$
$n$	=	project life (assumed at 40 years)

3. A developer or a franchisee will usually look at the financial return to the company. To them, the benefit  $B_i$  is the financial income from the project and  $C_i$  is the financial cost incurred. In other words, they look at the Financial Internal Rate of Return (FIRR) which measures whether the project is an attractive investment financially.

4. On the other hand, Government looks at the overall benefit brought to the community by the project. For transport infrastructure, the bulk of such benefit refers to the saving in travelling time for the public and congestion relief to adjacent roads. The EIRR therefore measures the overall cost effectiveness of the project to the community as a whole. For the proposed SIL, we estimate that for the year 2016, SIL will result in a total time saving of 20 million hours to the community. After monetising this time saving and including other benefits, SIL will bring forth an economic benefit less operating cost of \$1.5 billion\* to the overall community in the same year. For an assumed 40 years operating period, the total time saving and economic benefit is about 1 000 million hours and \$100 billion\* respectively. This compares to the total \$17 billion\* construction together with refurbishing and operating costs over the same 40-year period. Using the IRR equation above, we evaluate that the investment on SIL would generate an EIRR of about 16%.

(\*December 2000 prices)

### **Configuration of SIL**

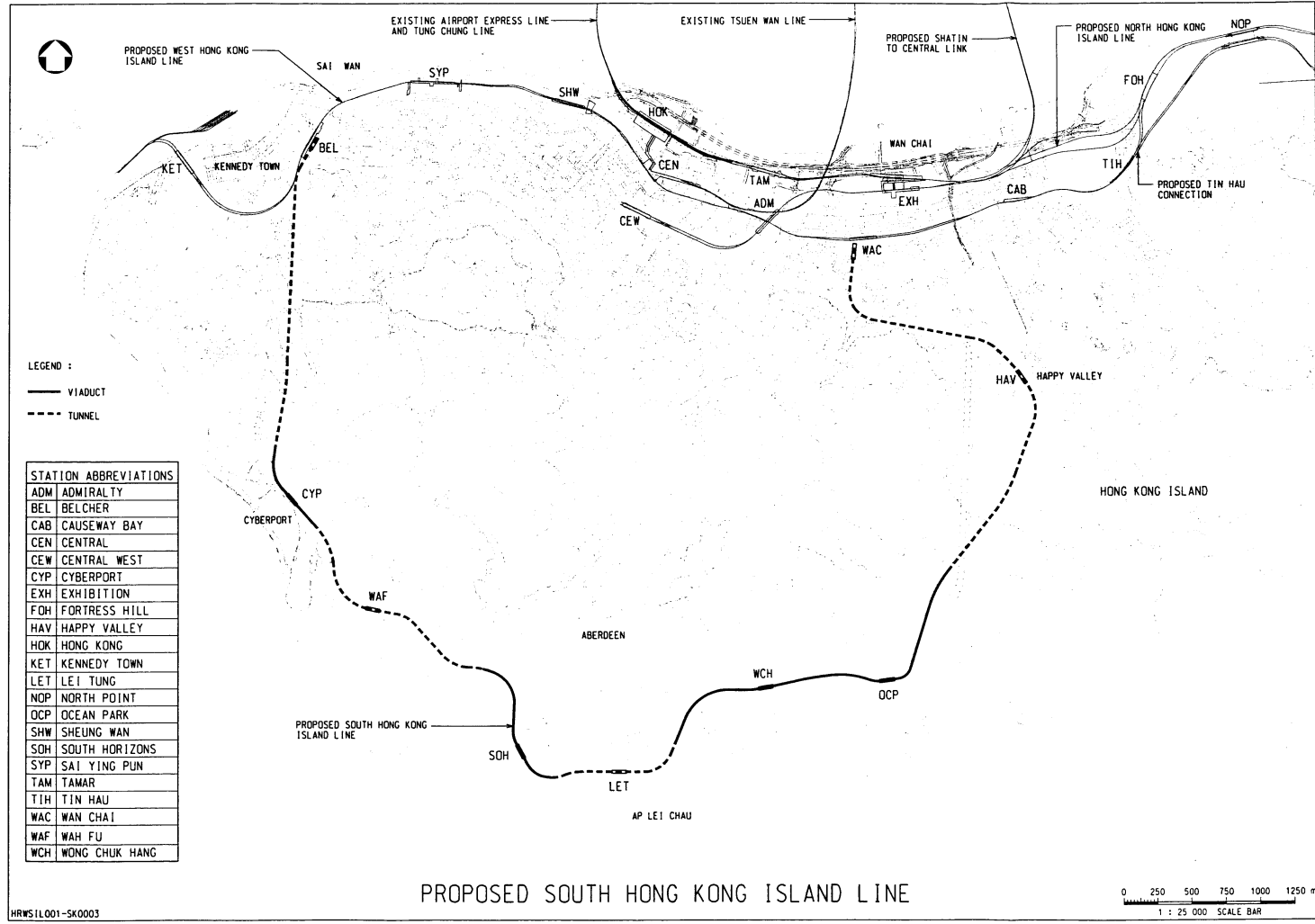
5. **Annex A** shows the viaduct and tunnel sections of SIL as stated in MTRCL's preliminary proposal on the project.

### **Protection Works for NIL**

6. It is difficult to determine the amount of additional cost to construct NIL in future (i.e. after 10 years or so) without the protection works as it depends on various factors which cannot be meaningfully ascertained at this stage, such as the development programme of the sites north of NIL, the traffic conditions at the time and the possibility of technical advancement on construction methods. More importantly, the alignment of the NIL might need to change because of changing circumstances and thus rendering the protection works useless.

7. While the absence of the protection works will cause problems to traffic and existing facilities and structures, we consider that such problem can be resolved technically and would not render future construction of NIL impossible. But we would include protection work related to the TWL Immensed Tube at a cost of \$10 million to protect the TWL's operation.

Environment, Transport and Works Bureau  
February 2003  
[ETWB(T)CR 11/1016/99]



STATION ABBREVIATIONS

ADM	ADMIRALTY
BEL	BELCHER
CAB	CAUSEWAY BAY
CEN	CENTRAL
CEW	CENTRAL WEST
CYP	CYBERPORT
EXH	EXHIBITION
FQH	FORTRESS HILL
HAV	HAPPY VALLEY
HOK	HONG KONG
KET	KENNEDY TOWN
LET	LEI TUNG
NQP	NORTH POINT
OCP	OCEAN PARK
SHW	SHEUNG WAN
SOH	SOUTH HORIZONS
SYP	SAI YING PUN
TAM	TAMAR
TTH	TIN HAU
WAC	WAN CHAI
WAF	WAH FU
WCH	WONG CHUK HANG

PROPOSED SOUTH HONG KONG ISLAND LINE

