For Discussion
on 18 March 2005

Legislative Council Panel on Transport

Northwest New Territories Traffic and Infrastructure Review 2004

PURPOSE

This paper informs Members of our work plan drawn up in the light of the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review (the Review) 2004.

BACKGROUND

2. The Review aims to assess the long-term needs for transport infrastructure development in NWNT and North Lantau, taking into account the impact of the major projects now under construction or planning in the areas. These include the Hong Kong - Shenzhen Western Corridor (HK-SWC), Deep Bay Link (DBL), Lok Ma Chau Spur Line, Hong Kong Disneyland Phase I and Hong Kong – Zhuhai – Macao Bridge (HZMB). In conducting the Review, we have noted various initiatives for new tourism and logistics development in Lantau. However, since these initiatives are still at the public consultation or preliminary planning stage, we can only assess their impact on the transport infrastructure needs in NWNT and Lantau as and when more definite plans for them emerge in the future.

3. When we last updated Members on the progress of the Review vide LC Paper No. CB(1)2180/03-04(02) on 25 June 2004, Members expressed concern that an implementation timetable for the four possible packages of road projects then identified in the Review and set out in LC Paper No. CB(1)2291/02-03(04) had yet to be drawn up by the Administration. To recap, the four possible packages making up the maximal network of new roads to meet the traffic demands of NWNT and North Lantau are summarized below and indicated on the map at **Enclosure 1** –

Encl 1

Package A

A1 : Road connecting HZMB and North Lantau Highway

A2 : Lantau Road P1 between Tung Chung and Sunny Bay (Sunny Bay was formerly known as "Yam O" but has been renamed in the Lantau Concept Plan Public Consultation Document)

A3 : Tsing Yi – Lantau Link (TYLL)

A4 : Pa Tau Kwu section of Chok Ko Wan Link Road

Package B

B1 : So Kwun Wat Link Road

B2 : Sham Tseng Tunnel Link Road

Package C

C1 : Lam Tei Tunnel

C2 : So Kwun Wat Interchange

C3 : Tai Lam Chung Tunnel

C4 : Tsing Lung Bridge and interchanges at Tuen Mun Road and North Lantau Highway

C5 : "Coastal Road" from Tsing Lung Bridge and an interchange with Tsing Yi-Lantau Link

Package D

D1 : Tuen Mun Western Bypass

D2 : Tuen Mun – Chek Lap Kok Link (TM–CLKL)

4. Since then, we have re-assessed the four possible packages against the latest planning data and assumptions available. We have drawn up the relative implementation priorities of the possible road projects and a tentative implementation timeframe.

DETAILS OF THE REVIEW

Planning Horizons

5. We have forecast the future traffic demands and assessed the effectiveness of various options of highway infrastructure provision for NWNT and North Lantau for the short (around 2011), medium (around 2016) and very

long term (20 years from now and beyond) planning horizons.

Highway Packages Examined

6. Our assessment shows that widening the expressway section of Tuen Mun Road (TMR) from the present dual-3 lane to dual-4 lane will induce additional traffic to the town centre section of TMR, which cannot be widened due to physical constraints, and is likely to lead to unacceptable congestion. To effectively divert traffic away from the town centre section of TMR, we consider it necessary to construct a Tuen Mun Eastern Bypass (TMEB). We have therefore drawn up an additional package, Package E, comprising TMEB and widening of the expressway section of TMR to dual 4-lane, which may be required in the longer-term.

7. A map showing the preliminary alignments of the five packages identified is at **Enclosure 1.**

Key Assumptions

8. We have used the latest planning parameters, including growth in the population, cross-boundary traffic and container throughput, as well as major development proposals currently under planning. The key input assumptions are set out in the table below –

Key Assumptions	2003/04 (for comparison)	Short Term	Medium Term	Very Long Term
Population in NWNT (’000)	1,040	1,190	1,300	1,400
Population in North Lantau (’000)	52	92	190	200
Total Daily Cross Boundary Traffic Flows (’000)	42	99	120	150
Annual Throughput of Container Terminals (million TEU)	12.2	18.3	25.7	29

Note : TEU stands for twenty-foot equivalent unit.

REVIEW FINDINGS

Encl 2

9. **Enclosure 2** sets out the 2004 and forecast traffic conditions of the major roads in NWNT and Lantau. The "Base Network" comprises :

(a) A1 (i.e. the road connecting HZMB to North Lantau Highway)[1];

(b) part of A2 (section of Lantau Road P1 between Tung Chung and Sham Shui Kok)[1];

(c) the traffic improvement measure for the town centre section of TMR that consists of an additional interchange to connect TMR with Castle Peak Road near Sam Shing Estate to provide an alternative access for the existing road traffic to and from TMR; and

Encl 3

(d) the series of traffic management schemes detailed in **Enclosure 3.**

10. The review results show that, in the short to medium term, the Base Network can in general cope with the traffic demands and will operate within manageable levels such that no new major highway infrastructure projects will be required. Route 3 (Country Park Section) together with TMR will provide adequate combined corridor capacity for the NWNT traffic while Lantau Link will be adequate to cater for the growth in traffic between North Lantau and the main urban area.

11. For the very long term planning horizon, different combinations of highway projects have been tested and the results are set out below -

(a) Package A (section of Lantau Road P1 between Sham Shui Kok and Sunny Bay of A2, TYLL (A3) and Pau Ta Kau section of Chok Ko Wan Link Road (A4)), which provides additional capacity for the Lantau–urban bound traffic, will be required only in the longer term beyond 2023;

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[1] A1 (i.e. Road connecting HZMB and North Lantau Highway) and Part of A2 (section of Lautau Road P1 between Tung Chung and Sham Shui Kok) will be taken forward separately in conjunction with the HZMB project and other developments in Tung Chung respectively. As such, they are included in the "Base Network".

(b) Package B was originally conceived as a complementary package to Package C to relieve a short section of TMR to serve additional traffic demand from NWNT to the urban area. However, this complementary function can be achieved by TYLL in Package A. Package B will therefore be no longer required; and

(c) Packages C, D and E are alternative solutions for meeting the forecast traffic demands between NWNT and Lantau/Urban areas. While each of the packages has its own advantages/disadvantages, as discussed in paragraphs 13 to 15 below, they may be considered as alternative initial building blocks upon which additional projects can subsequently be added to accommodate the very long term traffic demands in the region. Using these three packages as the initial building blocks, three implementation options – Options 1 to 3 (**Enclosures 4 to 6**) – have been developed and are summarized in paragraph 12 below.

Encl 4-6

12. The following table sets out the respective components, the anticipated windows of implementation and the estimated costs of the three options -

	Projects[1]	**Anticipated Implementation Window**	**Project Cost**[2] **($billion)**	**Total Cost ($billion)**
Option 1	Package C (except C5)	2017 – 2022	13.5	36.3
	A2[3]	2017 – 2022	2.3	
	A3	2023 and beyond	17.7	
	A4	2023 and beyond	1.8	
	C5	2023 and beyond	1.0	
Option 2	Package D	2017 – 2022	16.4	38.2
	A2[3]	2023 and beyond	2.3	
	A3	2023 and beyond	17.7	
	A4	2023 and beyond	1.8	
Option 3	Package E[4]	2017 – 2022	7.5	36.8
	C4	2017 – 2022	6.5	
	A2[3]	2017 – 2022	2.3	
	A3	2023 and beyond	17.7	
	A4	2023 and beyond	1.8	
	C5	2023 and beyond	1.0	

Note:

1. The compositions and locations of various Packages are shown in Enclosure 1.
2. "Project Cost" includes both the capital and land costs of the project.
3. Section between Sham Shui Kok and Sunny Bay.
4. All of the options shown above have assumed the re-constructed and improved expressway section of TMR with its present dual 3-lane configuration. As such, the project cost of Package E is for the widening of TMR to dual-4 lane in the very long term plus the cost for TMEB.

Preliminary Comparison of Options

13. Option 1 (**Enclosure 4**) will provide an additional two to three traffic lanes in the north-south corridor between NWNT and the main urban area, and will hence provide adequate reserve capacity to cater for further traffic growth in NWNT as well as traffic from HK-SWC. As indicated in Enclosure 4, this option will result in a more balanced distribution of traffic with relatively lower volume to capacity (v/c) ratios[2] when compared with Options 2 and 3 in the very long-term scenario. The estimated total project cost for this option is the lowest amongst the three options.

14. Option 2 (**Enclosure 5**) will provide a more direct link between NWNT and Northwest Lantau. Its attractiveness will increase if significant growth occurs in Northwest Lantau such as that arising from a busy new container port (if it goes ahead), a significant increase in airport related traffic, a new Logistics Park and a very high volume of traffic from HZMB. On the other hand, this option will provide the least relief to the NWNT–Urban traffic, with Ting Kau Bridge and much of TMR operating at a v/c ratio of 1.2.

15. Option 3 (**Enclosure 6**) will improve the capacity of TMR by providing one extra traffic lane. However, this option will not be able to cater for a further increase in traffic beyond the very long-term assumptions adopted in the Review. In particular, the town centre and Siu Lam sections of TMR will be congested with v/c ratios increasing beyond 1.2. Other highway infrastructure projects, such as Package C or D, will be required eventually.

[2] A v/c ratio is normally used to reflect traffic situation during peak hours. A v/c ratio below 1 is considered acceptable. A v/c ratio above 1.0 indicates the onset of mild congestion and a v/c ratio between 1.0 and 1.2 would indicate a manageable degree of congestion. A v/c ratio above 1.2 indicates the onset of more serious congestion.

16. The main determinants of the optimum highway network options are the location, and the extent and pace of various major development proposals in the area. However, as at present, there are uncertainties in various input assumptions, such as the nature and extent of the various development proposals including the Strategic Growth Areas in NWNT, the Logistics Park in Lantau, the further expansion of the Airport, the location, scale and pace of development of the new container terminal, and the traffic volumes from the new boundary crossing of HZMB. The feasibility and timing, and hence the traffic impact of some of these development proposals have yet to be ascertained. Variation in their scale and speed will inevitably affect the relative priorities, timing and choice of the proposed options for the various highway infrastructure projects. Our current assessment is that there is no immediate need to make a final decision on which option to pursue. It would be prudent to carry out further investigations and engineering feasibility studies of the various highway projects while keeping in view the position of the various major development proposals before deciding on the optimal option of highway infrastructure provision that should be pursued. The preparatory work should be carried out now such that we can implement the optimal option at the earliest opportunity once the future development picture becomes clearer.

THE WAY FORWARD

17. In the light of the findings of the Review, we have drawn up the relative priorities and a broad implementation timeframe for the necessary highway infrastructure to meet the traffic needs of NWNT and North Lantau. However, as planning of the major developments in the region is still underway, we will continue to monitor closely the pace of such developments and make corresponding adjustments to the implementation programme and relative priorities of the highway projects.

18. We will implement the traffic improvement measures listed in Enclosure 3 to increase the capacity of the Town Centre Section of TMR. Meanwhile, to speed up the process, we will carry out further investigation and engineering feasibility studies on the various projects to ascertain their technical feasibility, costs and environmental impacts for subsequent evaluation and determination of the optimal option. As a first step, we will start the studies on the following highway projects –

(a) TYLL;

(b) TMEB;

(c) TM–CLKL; and

(d) options for linking Tuen Mun to Lantau.

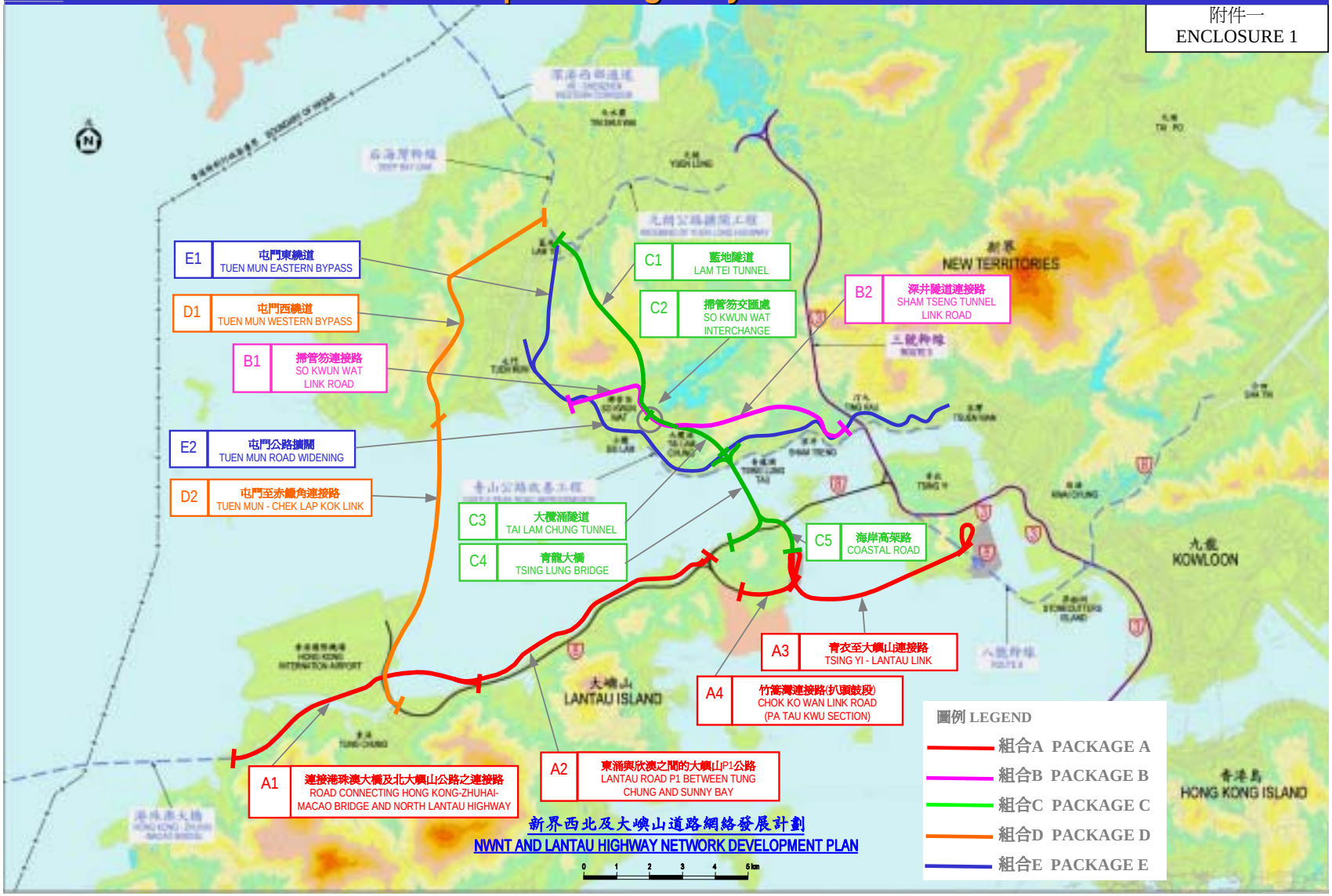
ADVICE SOUGHT

19. Members are requested to note the contents of the paper.

Environment, Transport and Works Bureau
March 2005

擬議公路發展組合
Proposed Highway Network

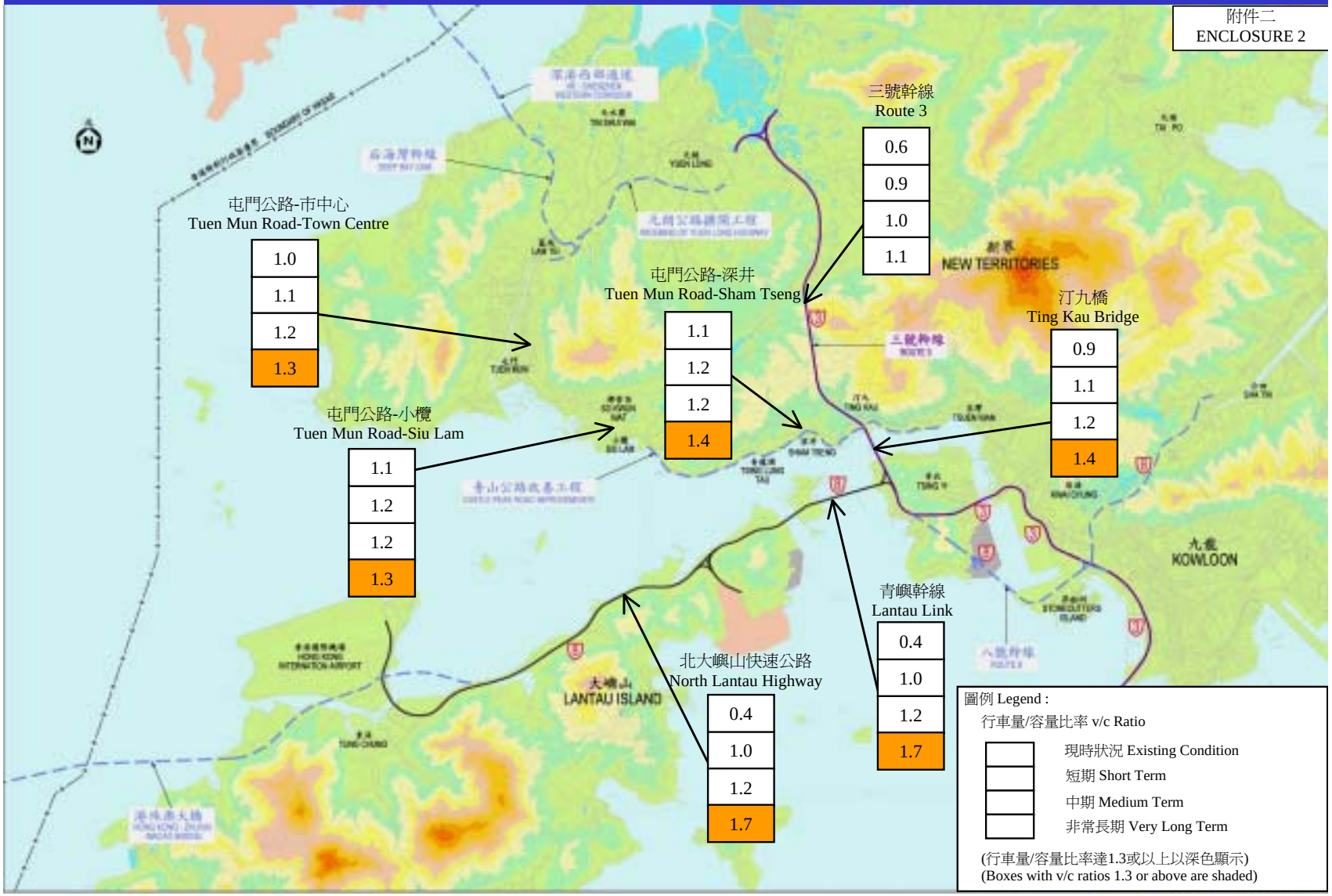
附件一
ENCLOSURE 1



新界西北及大嶼山道路網絡發展計劃
NWNT AND LANTAU HIGHWAY NETWORK DEVELOPMENT PLAN

基本公路網的交通狀況
Traffic Condition Under Base Network

附件二
ENCLOSURE 2



Enclosure 3

Short to Medium Term Measures to Improve the Traffic Conditions of Tuen Mun Road (TMR)

Improvements to the Town Centre Section (TCS) of TMR

(1) Lengthening of Bus Bays alongside TCS of TMR

Scope

The works, completed in February 2005, involved lengthening the existing bus bay on TMR southbound near Tseng Choi Street.

Traffic Benefits

2. The bus bay near Tseng Choi Street could accommodate at most three buses each time in the past before the improvement works. Due to the limited capacity of this bus bay, buses very often had to queue up when loading/unloading passengers, thus blocking traffic along TMR – TCS. Lengthening this bus bay by 13 metres has increased its capacity, which in turn has reduced obstruction to the main road traffic.

(2) Improvement of Merging Lane from Tuen Hi Road into TMR – TCS

Scope

3. The improvement works will lengthen the merging length and improve the road markings to facilitate a better traffic merging arrangement from Tuen Hi Road to TMR northbound. Works are scheduled to commence in mid 2005 for completion by end 2005.

Traffic Benefits

4. Tuen Hi Road is a service road parallel to TMR with a short merging lane to TMR northbound. As a result of the difficulties in merging into TMR, traffic queues often develop along Tuen Hi Road, especially during peak hours, thus blocking vehicles from TMR entering this service road for

loading/unloading activities. This blockage further leads to tailing back of vehicles to TMR – TCS, thus causing congestion. The proposed improvement works will improve both the local traffic and road safety conditions.

(3) Widening of TMR at Tsing Tin Road Interchange Section

Scope

5. The improvement works will widen TMR at Tsing Tin Road Interchange Section to a dual 3-lane carriageway. The feasibility study of the works is underway. The improvement works are scheduled to start tentatively in early 2007 for completion in mid 2008.

Traffic Benefits

6. The existing TMR at the Tsing Tin Road Interchange Section is a dual 2-lane carriageway with a v/c ratio of about 1.04. This is one of the most critical sections in the TMR – TCS. It is forecast that after the commissioning of the Hong Kong – Shenzhen Western Corridor (HK-SWC) and Deep Bay Link (DBL), the v/c ratio at this section will increase to 1.18. After widening this section of TMR to a dual 3-lane carriageway, the v/c ratio at this section is expected to be reduced to below 1. A layout plan of the proposed works is at **Annex** to this Enclosure.

(4) Modification of Directional Signs

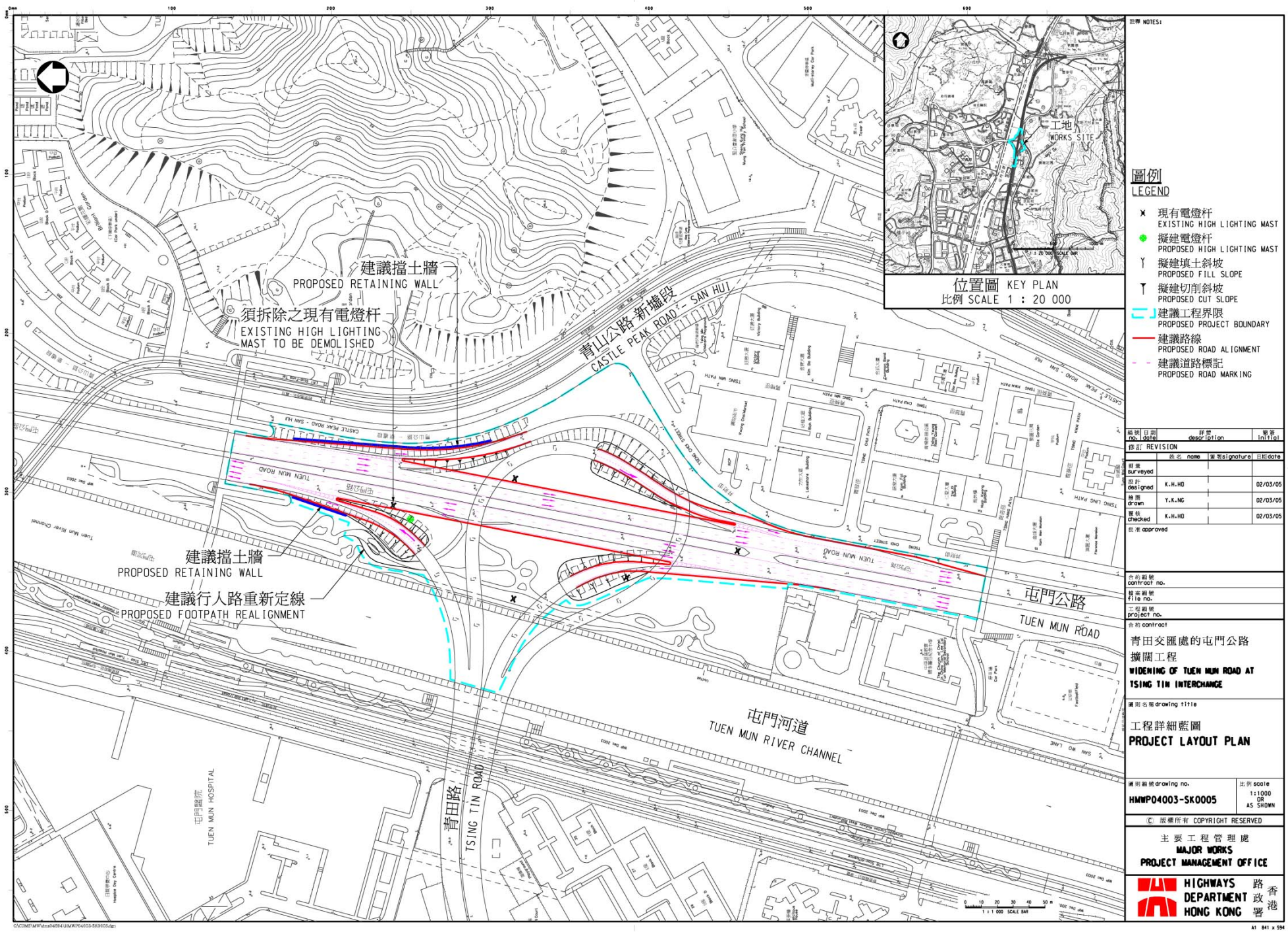
Scope

7. We will modify some of the existing directional signs in the Tuen Mun district and to provide additional directional signs within the town centre to encourage motorists in the Tuen Mun New Town to use parallel routes in lieu of TMR – TCS for their journeys to Tsuen Wan and Kowloon. The modification works are scheduled to be completed by the end of 2005.

Traffic Benefits

8. Ming Kum Road, Tsing Wun Road and Wong Chu Road are parallel routes to TMR – TCS. Diversion of traffic from TMR – TCS heading

Tsuen Wan and Kowloon to these parallel routes, which join TMR near Sam Shing Estate, will reduce traffic loading at TMR – TCS.


建議擋土牆
PROPOSED RETAINING WALL
須拆除之現有電燈杆
EXISTING HIGH LIGHTING MAST TO BE DEMOLISHED
青山公路 新墟段
CASTLE PEAK ROAD - SAN HUI
建議擋土牆
PROPOSED RETAINING WALL
建議行人路重新定線
PROPOSED FOOTPATH REALIGNMENT
屯門公路
TUEN MUN ROAD
屯門河道
TUEN MUN RIVER CHANNEL
青田路
TSING TIN ROAD
屯門醫院
TUEN MUN HOSPITAL
工地
WORKS SITE
位置圖 KEY PLAN
比例 SCALE 1 : 20 000
圖例
LEGEND
現有電燈杆
EXISTING HIGH LIGHTING MAST
擬建電燈杆
PROPOSED HIGH LIGHTING MAST
擬建填土斜坡
PROPOSED FILL SLOPE
擬建切削斜坡
PROPOSED CUT SLOPE
建議工程界限
PROPOSED PROJECT BOUNDARY
建議路線
PROPOSED ROAD ALIGNMENT
建議道路標記
PROPOSED ROAD MARKING
修訂 REVISION
青田交匯處的屯門公路
擴闊工程
WIDENING OF TUEN MUN ROAD AT TSING TIN INTERCHANGE
工程詳細藍圖
PROJECT LAYOUT PLAN
HMWP04003-SK0005
1:1000
AS SHOWN
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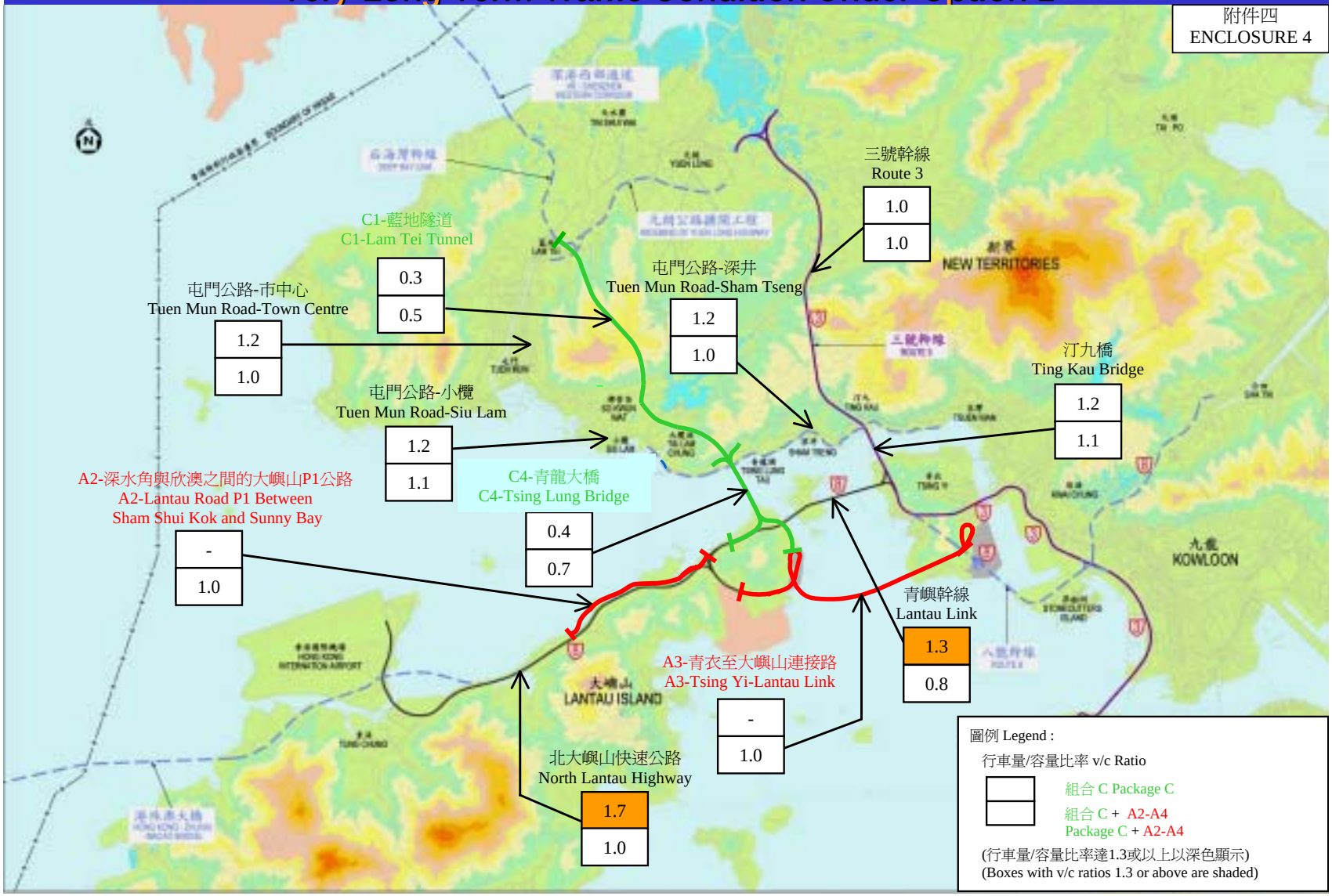
主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE
HIGHWAYS DEPARTMENT HONG KONG
路政署 香港

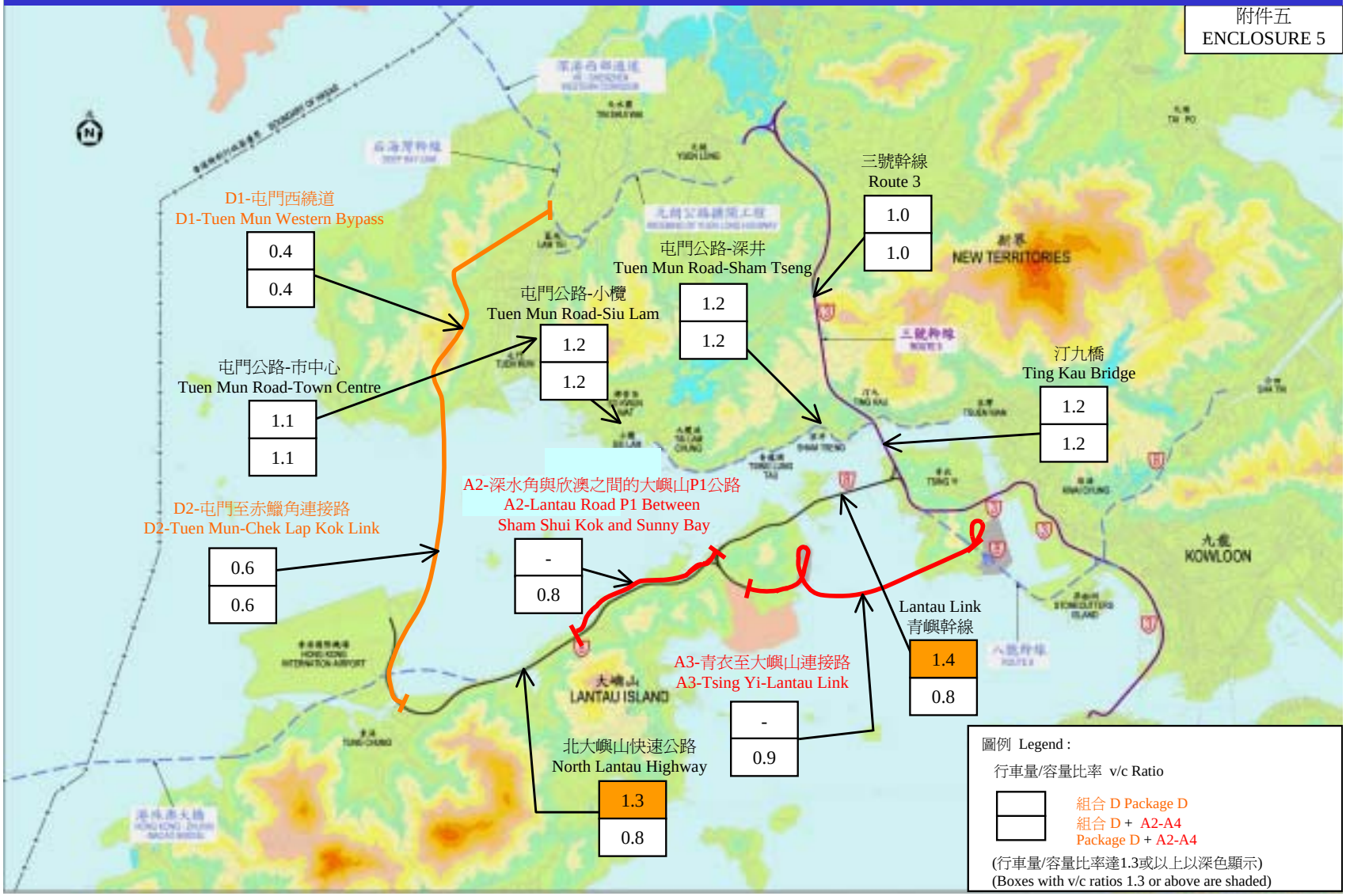
方案一的非常長期交通狀況
Very Long Term Traffic Condition Under Option 1

附件四
ENCLOSURE 4



方案二的非常長期交通狀況
Very Long Term Traffic Condition Under Option 2

附件五
ENCLOSURE 5



方案三的非常長期交通狀況
Very Long Term Traffic Condition Under Option 3

附件六
ENCLOSURE 6