

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

**HEAD 707 - NEW TOWNS AND URBAN AREA DEVELOPMENT**  
**New Territories West Development**  
**Transport - Roads**  
**52TH - Route 5 - section between Shek Wai Kok and Chai Wan Kok**

Members are invited to recommend to Finance Committee the upgrading of **52TH** to Category A at an estimated cost of \$1,171.6 million in money-of-the-day prices.

### **PROBLEM**

We need to construct the remaining section of Route 5 between Shek Wai Kok and Chai Wan Kok to relieve traffic congestion in Tsuen Wan.

### **PROPOSAL**

2. The Director of Territory Development (DTD), with the support of the Secretary for Transport, proposes to upgrade **52TH** to Category A at an estimated cost of \$1,171.6 million in money-of-the-day (MOD) prices for the construction of the remaining section of Route 5 between Shek Wai Kok and Chai Wan Kok in Tsuen Wan.

### **PROJECT SCOPE AND NATURE**

3. The scope of works for **52TH** comprises -

/ (a) .....

- (a) construction of a 1 300-metre (m) long dual 2-lane carriageway from Cheung Pei Shan Road at Shek Wai Kok to Castle Peak Road near Tsuen Wan Police Station at Tsuen King Circuit, including a 97m long flyover across the Mass Transit Railway tracks (a 190m section through Discovery Park has been completed by the developer);
- (b) widening and upgrading of a 700m long existing section of Castle Peak Road between Tsuen Wan Police Station and Chai Wan Kok to dual 4-lane carriageway;
- (c) improvement of Chai Wan Kok Interchange including extension of a flyover (about 166m in length), a 55m long underpass and associated slip roads connecting Castle Peak Road with Tuen Mun Road;
- (d) construction of a pedestrian subway and a footbridge;
- (e) associated roadworks, drainage and sewerage works, slope works, waterworks and landscaping works;
- (f) provision of noise mitigation measures including about 615m of semi-enclosed noise barriers (5.5 m high), about 1 190 m of cantilever noise barriers (4 to 8 m high) and low noise road surfacing; and
- (g) an environmental monitoring and audit (EM&A) programme for the works mentioned in paragraphs (a) to (f) above.

The site plans are at Enclosures 1 and 2.

## JUSTIFICATION

4. Route 5 is a trunk road connecting Sha Tin and Tsuen Wan via the Shing Mun Tunnels. The section of Route 5 between Sha Tin and Shek Wai Kok, Tsuen Wan was completed in 1990. The remaining section of Route 5 to be completed under 52TH runs from Shek Wai Kok to Chai Wan Kok.

5. At present, vehicular traffic between the Shing Mun Tunnels and Tuen Mun Road/Castle Peak Road has to pass through the congested local road network within Tsuen Wan. During peak hours, road junctions in the area operate at full capacity. Traffic congestion occurs on the approaches to Castle Peak Road (Tsuen Wan Section) between Sha Tsui Road and Sai Lau Kok Road, in the Kowloon bound direction in the morning and in the Tuen Mun bound direction in the evening. The proposed roadworks will provide a direct trunk road link between the Shing Mun Tunnels and Tuen Mun Road, as well as a local link to western Tsuen Wan. They will help relieve the present traffic congestion in the area.

6. The Traffic Impact Assessment review completed in June 1999 indicated that a number of road junctions in Tsuen Wan town centre cannot cope with the growing traffic demand. In particular, the junctions at Castle Peak Road/Tai Chung Road, Sha Tsui Road/Tai Ho Road and Castle Peak/Tai Ho Road are operating at or beyond their capacities. The most critical one is the Tsuen Kam Interchange. The completion of the Tsing Yi North Coastal Road in 2002 will increase the traffic volume at the Interchange because the road will provide a more convenient link between Sha Tin and Lantau/Northwest New Territories via the Shing Mun Tunnels. We expect that the Interchange will be heavily overloaded by 2006 causing significant delay and long traffic queues on the approach roads. The projected volume/capacity (v/c) ratios<sup>1</sup> in 2006 and 2011 during the peak hours at Tsuen Kam Interchange with and without the proposed roadworks are as below -

|                            | Year |                   |
|----------------------------|------|-------------------|
|                            | 2006 | 2011              |
| With proposed roadworks    | 0.82 | 0.80 <sup>2</sup> |
| Without proposed roadworks | 1.71 | 1.88              |

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<sup>1</sup> A volume/capacity (v/c) ratio equals to or less than 1.0 means that the road has sufficient capacity to cope with the volume of vehicle traffic under consideration and the resultant traffic will flow smoothly. A v/c ratio above 1.0 indicates the onset of congestion; above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating with further increases in traffic.

<sup>2</sup> Normally the v/c ratio should increase over the years due to natural growth in traffic volume. However, the traffic model indicated that there will be a marginal decrease in traffic flows on Route Twisk via Tsuen Kam Interchange in 2011 because of the completion of Route 9 and other strategic roadworks in Northwest New Territories by 2011.

When Route 5 is in place, the projected journey time between Chai Wan Kok and Shek Wai Kok would be reduced from 12.4 minutes to 2.8 minutes.

7. The review recommended that the remaining section of Route 5 should be completed as soon as possible in order to provide traffic relief to the distributor roads in Tsuen Wan, such as Castle Peak Road, Tai Chung Road, Sha Tsui Road and Tai Ho Road. We plan to start construction in November 2000 for completion in January 2005.

## FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the project to be \$1,171.6 million in MOD prices (see paragraph 9 below), made up as follows –

|                                                | \$ million |
|------------------------------------------------|------------|
| (a) At grade roadworks                         | 120.0      |
| (b) Elevated bridge structures                 | 290.0      |
| (i) foundations                                | 100.0      |
| (ii) substructures                             | 15.0       |
| (iii) superstructures                          | 175.0      |
| (c) Underpasses                                | 77.0       |
| (d) One pedestrian subway and one footbridge   | 8.0        |
| (e) Retaining walls and slope works            | 120.0      |
| (f) Drainage and sewerage works and waterworks | 52.0       |
| (g) Landscaping works                          | 30.0       |
| (h) Noise mitigation measures                  | 110.0      |

|                                    | <b>\$ million</b> |                           |
|------------------------------------|-------------------|---------------------------|
| (i) semi-enclosed noise barriers   | 68.0              |                           |
| (ii) cantilever noise barriers     | 40.0              |                           |
| (iii) low noise road surfacing     | 2.0               |                           |
| (i) EM&A programme                 | 8.0               |                           |
| (j) Consultants' fees for -        | 95.0              |                           |
| (i) construction stage             | 12.0              |                           |
| (ii) site staff costs              | 83.0              |                           |
| (k) Contingencies                  | 90.0              |                           |
| Sub-total                          | 1,000.0           | (in December 1999 prices) |
| (l) Provision for price adjustment | 171.6             |                           |
| Total                              | 1,171.6           | (in MOD prices)           |

Owing to insufficient in-house resources, DTD proposes to employ consultants to carry out the construction supervision. A breakdown by man months of the estimate for consultants' fees is at Enclosure 3.

9. Subject to approval, we will phase expenditure as follows -

| <b>Year</b> | <b>\$ million<br/>(Dec 1999)</b> | <b>Price<br/>adjustment<br/>factor</b> | <b>\$ million<br/>(MOD)</b> |
|-------------|----------------------------------|----------------------------------------|-----------------------------|
| 2000 - 2001 | 10.0                             | 1.00000                                | 10.0                        |
| 2001 - 2002 | 170.0                            | 1.04500                                | 177.7                       |
| 2002 - 2003 | 230.0                            | 1.10770                                | 254.8                       |

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| Year        | \$ million<br>(Dec 1999) | Price<br>adjustment<br>factor | \$ million<br>(MOD) |
|-------------|--------------------------|-------------------------------|---------------------|
| 2003 - 2004 | 230.0                    | 1.17416                       | 270.1               |
| 2004 - 2005 | 240.0                    | 1.24461                       | 298.7               |
| 2005 - 2006 | 95.0                     | 1.31929                       | 125.3               |
| 2006 - 2007 | 25.0                     | 1.39845                       | 35.0                |
|             | <hr/> 1,000.0 <hr/>      |                               | <hr/> 1,171.6 <hr/> |

10. We have derived the MOD estimate on the basis of the Government's latest forecast trend of labour and construction prices for the period 2000 to 2007. We will tender the proposed works under a standard re-measurement contract, because the works involve extensive earthworks and foundation works, the quantities of which may vary according to actual ground conditions. The contract will provide for price adjustments as the construction period will exceed 21 months.

11. We estimate the annually recurrent expenditure to be \$17.2 million.

## **PUBLIC CONSULTATION**

12. We consulted the Traffic and Transport Committee of the Tsuen Wan District Board on 10 March 1993 and 23 July 1993 on the preliminary layout of the proposed road scheme. Members supported the scheme.

13. On 27 March 1995, we consulted the Environmental Affairs Committee of the Tsuen Wan District Board on the proposed environmental impact mitigation measures. Members supported the road scheme on traffic grounds, but expressed reservations with regard to the noise impact during construction and upon completion of the project.

14. We gazetted the road scheme under the Roads (Works, Use and Compensation) Ordinance on 28 April 1995 and received 12 objections from two distinct groups. The first group, consisting of the Mass Transit Railway Corporation, various land owners and local residents, all objected to Government's resumption of their land and wished to safeguard their individual interests. They were also concerned about the environmental and traffic impacts of the project. The second group consisted of members of the Tang Clan who objected to the road scheme on the grounds that the project may have some 'fung shui' impact on an ancestral grave in the area. We explained to the objectors that the proposed works were required because of traffic needs. We also explained the recommended environmental mitigation measures under the project and traffic management measures to be carried out during the construction stage. However, we did not succeed in persuading any of the objectors to withdraw their objections. On 17 June 1997, the then Governor in Council overruled the objections in the public interest and authorized the road scheme with modifications. The modifications, originating from the objectors' comments, involve the provision of a footway on the top of a section of the retaining wall near the Tang Clan ancestral grave and conversion of part of a footway to a carriageway at the junction of Sha Tsui Road and Castle Peak Road.

15. We issued an information paper to Members of the Transport Panel of the Legislative Council on 16 May 2000.

## **ENVIRONMENTAL IMPLICATIONS**

16. The whole Route 5 project is an exempted designated project under Section 9(2)d and Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO). The environmental impacts during construction and operation were assessed in an EIA study completed in February 1995 and now lodged in the EIAO Register. The study concluded that the environmental impacts of the project, including construction impacts and operational noise and air quality impacts, could be controlled to within the established standards and guidelines. We will implement the recommended mitigation measures to control operational noise to a practicable minimum by incorporating them into the works contract. These measures include the provision of low noise road surfacing along the full length of the road, construction of cantilever noise barriers (about 1 190m long ranging from 4m to 8m in height) and semi-enclosed noise barriers (about 615m long and 5.5m high). Modelling of air quality impacts indicated that identified sensitive receivers along the proposed route will not be subjected to air quality impacts which exceed the Air Quality Objectives, established under the

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Air Pollution Control Ordinance, for hourly Nitrogen Dioxide and daily Respirable Suspended Particulate during the life of the project<sup>3</sup>.

17. In April 1995, the Advisory Council on the Environment endorsed the EIA with the conditions that complaint hotlines should be provided during the construction period to handle complaints from nearby residents, and that there should be independent monitoring of the environmental impacts. In August 1999, we completed an Environmental Review (ER), taking into account the latest information available and the comments received during the public consultations. The ER concluded that the findings of the EIA report are still valid. To further reduce the predicted traffic noise impact on sensitive receivers, we have increased the recommended height of the noise barriers at TWTL 382 and Muk Min Ha Tsuen to the present level. To ensure compliance with the EIA recommendations, we will implement an EM&A programme. We will also incorporate into the works contract standard measures to control pollution arising during construction. These measures will include frequent watering of the site and the provision of wheel-washing facilities to reduce emission of fugitive dust, the use of silenced construction plant to reduce noise generation and other procedures as recommended in Environmental Protection Department's Recommended Pollution Control Clauses. We have included the costs of implementing the environmental mitigation measures (\$110 million) and an EM&A programme (\$8 million) (both in December 1999 prices) in the overall project estimate.

18. At the planning and design stages, we have considered optimising the road levels to reduce the generation of construction and demolition material (C&DM) as much as possible. We estimate that about 75 300 cubic metres (m<sup>3</sup>) of C&DM will be generated by the project, of which 14 100m<sup>3</sup> C&D waste will be disposed of at landfills. Although the remaining 61 200m<sup>3</sup> public fill will be reused as filling material in the project, about 88 800m<sup>3</sup> of filling material will need to be imported from elsewhere.

19. Under the terms of the contract, we will require the contractor to submit a waste management plan for approval with appropriate mitigation measures, including the allocation of an area for waste segregation. We will ensure that the day-to-day operations on site comply with the approved waste

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<sup>3</sup> The peak hour concentrations for Nitrogen Dioxide would range from 146 to 286 µg/m<sup>3</sup> and the daily average respirable suspended particulate would range from 96 to 135 µg/m<sup>3</sup>, which are below the air quality objectives of 300 and 180 µg/m<sup>3</sup> respectively.

management plan. We will also require the contractor to reuse the excavated material on site as filling material as far as possible to minimise the disposal of public fill to public filling areas. To further minimise the generation of C&DM, we will encourage the contractor to use non-timber formwork, hoarding and other temporary works. We will require the contractor to separate public fill from C&D waste for disposal at appropriate locations and to sort the C&D waste by category on site to facilitate reuse/re-cycling in order to reduce the generation of such waste. We will control the disposal of public fill and C&D waste to designated public filling areas and landfills respectively through a trip ticket system. We will record the disposal, reuse and re-cycling of C&DM for monitoring purposes.

20. The proposed works will cause limited ecological impacts including loss of introduced or cultivated plant species, and some loss of trees and scrub vegetation. To mitigate the landscape and visual impacts of the project, we will provide the maximum practicable amount of compensatory woodland planting on all disturbed and new slopes, and screen planting along the roadside areas. In this respect, we will plant about 41 000 trees and shrubs and use hydroseeding to protect formed slopes as appropriate. We will also minimize the visual impacts of the roadside slopes by integrating the geometry of the new slopes and the colour of the associated features into their surrounding landscape setting. Regarding the highway structures and the noise mitigation structures, we will provide visual interest and maintain visual continuity by coordinating the architectural design and treatment for all different forms of structures into a unified, coherent and visually pleasing appearance. We have included a sum of \$30 million (in December 1999 Prices) for the landscaping works in the overall project estimate.

## LAND ACQUISITION

21. We will clear about 18.9 hectares of government land and resume about 30 square metres (m<sup>2</sup>) of agricultural land and about 1 100m<sup>2</sup> of building land. The land acquisition and clearance will affect 59 households involving 151 persons and 121 structures. The Director of Housing will offer eligible clearerees accommodation in public housing in accordance with the existing housing policy. We will charge the cost of land acquisition and clearance, estimated at \$196 million, to Head **701** - Land Acquisition.

/ **BACKGROUND** .....

**BACKGROUND INFORMATION**

22. In April 1990, we completed the first phase of Route 5 connecting Sha Tin and Shek Wai Kok in Tsuen Wan (including Shing Mun Tunnels) under **288TH** “Route 5 – section between Wo Yi Hop and Shek Wai Kok” at an estimated cost of \$286.1 million in MOD prices and **173TH** “Route 5 – Sha Tin to Tsuen Wan, Shing Mun Section” at an estimated cost of \$809 million in September 1990 prices.

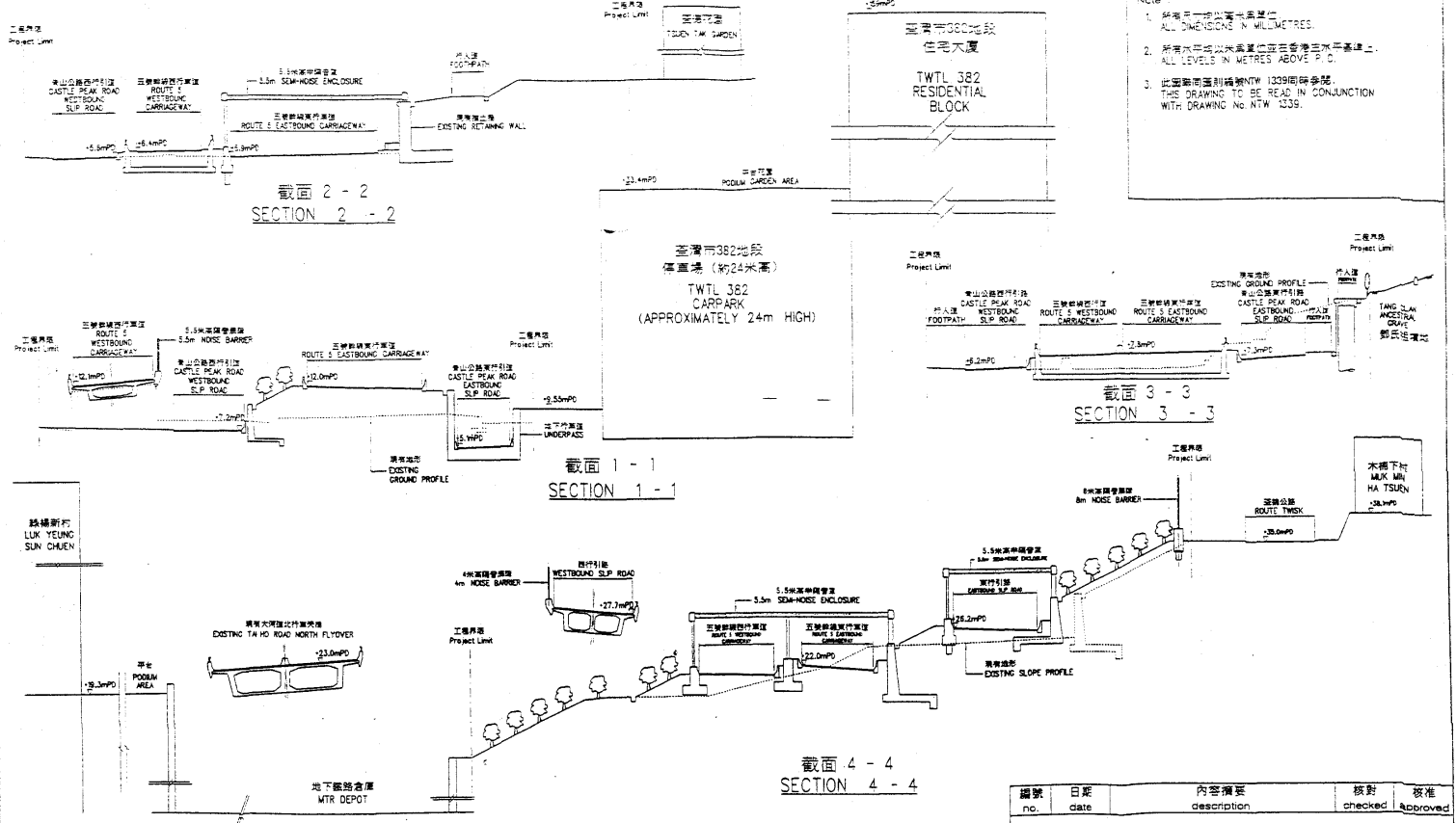
23. We upgraded **52TH** to Category B in April 1991 for the remaining phase of Route 5. We started the preliminary design of the project in early 1992. The progress of the preliminary design was however hindered by strong objections from the Tang Clan to the proposed road layout. As a result of the lengthy negotiations with the Tang Clan, and the need to look into alternative road alignments, we could not complete the preliminary design until early 1995. To resolve the objections from the Tang Clan under the Roads (Works, Use and Compensation) Ordinance, a further 26 months was needed to complete the necessary statutory procedures.

24. In January 1998, we upgraded part of **52TH** to Category A as **716TH** “Route 5 - section between Shek Wai Kok and Chai Wan Kok : site investigation and consultants’ fees” at an estimated cost of \$85 million in MOD prices for engaging consultants to carry out the site investigation and the detailed design of the project. The consultants have completed the site investigation, detailed design and preparation of tender documents for the proposed works.

25. To minimise traffic disruption during construction, we will carry out temporary traffic diversion arrangements as and when necessary.

26. We estimate that the project will provide some 520 jobs totalling 26 520 man months comprising 21 professional/managerial staff, 64 technical/ancillary staff and 435 labourers.





NOTE

1. 所有尺寸均以毫米為單位  
ALL DIMENSIONS IN MILLIMETRES.
2. 所有水平高度均以香港三水平基準上  
ALL LEVELS IN METRES ABOVE P.D.
3. 此圖與圖則編號NTW 1339圖則參照  
THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. NTW 1339.

二〇〇〇至二〇〇一年度工程小組委員會文件 PWSC SUBMISSION 2000 - 2001

| 編號<br>no.        | 日期<br>date    | 內容摘要<br>description                                             | 核對<br>checked | 核准<br>approved |
|------------------|---------------|-----------------------------------------------------------------|---------------|----------------|
| 修訂 REVISION      |               |                                                                 |               |                |
| 項目編號 item no.    | 52TH          | 辦事處 office<br>新界西拓展處<br>NEW TERRITORIES WEST DEVELOPMENT OFFICE |               |                |
| 比例 scale         | 1 : 400       |                                                                 |               |                |
| 圖則編號 drawing no. | NTW 1340      | 拓展署<br>TERRITORY DEVELOPMENT DEPARTMENT                         |               |                |
| 繪圖 drawn         | W. W. YU      |                                                                 |               |                |
| 核對 checked       | C. S. CHOI    |                                                                 |               |                |
| 核准 approved      | C. J. CHIVERS |                                                                 |               |                |

五號幹線 - 石圍角至柴灣角段  
ROUTE 5 - SECTION BETWEEN SHEK WAI KOK AND CHAI WAN KOK

**52TH - Route 5 - section between Shek Wai Kok and Chai Wan Kok****Breakdown of estimate for consultants' fees**

| Consultants' staff costs       |                                          |              | Estimated man months | Average MPS* salary point | Multiplier factor | Estimated fee (\$ million) |
|--------------------------------|------------------------------------------|--------------|----------------------|---------------------------|-------------------|----------------------------|
| (a)                            | Consultants' fees for construction stage |              |                      |                           |                   |                            |
| (i)                            | contract administration                  | Professional | 60                   | 40                        | 2.4               | 9.0                        |
|                                |                                          | Technical    | 20                   | 16                        | 2.4               | 1.0                        |
| (ii)                           | preparation of as-built drawings         | Professional | 6                    | 40                        | 2.4               | 0.9                        |
|                                |                                          | Technical    | 22                   | 16                        | 2.4               | 1.1                        |
| (b)                            | Resident site staff costs                | Professional | 360                  | 40                        | 1.7               | 38.4                       |
|                                |                                          | Technical    | 1250                 | 16                        | 1.7               | 44.6                       |
| Total consultants' staff costs |                                          |              |                      |                           |                   | 95.0                       |

\* MPS = Master Pay Scale

**Notes**

1. A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier factor of 1.7 is applied to the average MPS point in the case of resident site staff supplied by the consultants. (At 1.4.99, MPS pt. 40 = \$62,780 p.m. and MPS pt. 16 = \$21,010 p.m.)
2. The figures given above are based on estimates prepared by the Director of Territory Development. The consultancy works for this project have been included as part of an existing consultancy agreement for the design and construction of Route 5 – section between Shek Wai Kok and Chai Wan Kok.