

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 - HIGHWAYS

Transport - Roads

746TH - Reconstruction and improvement of Tuen Mun Road

Members are invited to recommend to Finance Committee -

- (a) the upgrading of part of **746TH**, entitled “Reconstruction and improvement of Tuen Mun Road – investigation and preliminary design”, to Category A at an estimated cost of \$37.8 million in money-of-the-day prices; and
- (b) the retention of the remainder of **746TH** in Category B.

PROBLEM

Most at-grade sections of the Tuen Mun Road (TMR) are approaching the end of their serviceable life and are now in a state beyond economical repair. The lack of hard shoulders and the substandard lane widths of TMR have also adversely affected traffic flows along this busy highway.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport, proposes to upgrade part of **746TH** to Category A at an estimated cost of \$37.8 million in money-of-the-day (MOD) prices to engage consultants to undertake investigation and preliminary design work for the reconstruction and improvement at TMR.

PROJECT SCOPE AND NATURE

3. The scope of works for the project **746TH** includes -

- (a) reconstruction of the at-grade sections of TMR;
- (b) enlargement of the traffic lanes to standard width, provision of standard 3.3 metre-wide hard shoulders, construction of emergency lay-bys in areas where the provision of a standard hard shoulder is not feasible, and replacement of existing metal crash barriers with concrete profile barriers;
- (c) improvement of the merging/diverging arrangement at the interchanges at Sham Tseng and Siu Lam;
- (d) upgrading of the traffic control and surveillance system (TCSS); and
- (e) associated civil, structural and slope upgrading works, as well as works on environmental mitigation, drainage, road lighting, water mains, traffic aids and electrical and mechanical installation.

4. The part of the project we now propose to upgrade to Category A comprises -

- (a) investigation and preliminary design of the works described in paragraph 3 above, and
- (b) associated ground investigations.

A site plan is at Enclosure 1.

5. We plan to start investigation and preliminary design work for the project in December 2001 for completion in March 2003. We will then proceed with the detailed design of the project in November 2003 for completion in March 2005. We intend to commence construction works in 2005 for completion in 2010. The reconstruction and improvement works are estimated to cost some \$2.6 billion.

JUSTIFICATION

6. TMR is a 15.5-kilometre long dual 3-lane highway connecting Tsuen Wan and Tuen Mun. This highway, forming part of Route 2, comprises mainly at-grade road sections with approximately 1.6 kilometres on bridge structures. The Kowloon-bound and the Tuen Mun-bound carriageways of TMR were completed in 1978 and 1983 respectively. Most at-grade road sections are now approaching the end of their 20-year design life¹ and are beyond economical repair.

7. We have been carrying out improvement works to the Kowloon-bound carriageway of TMR at four intermittent uphill sections, namely Sam Shing Hui section, So Kwun Wat section, Tai Lam section and Ting Kau section under **520TH** – “Improvements to Tuen Mun Road”². We intend to reconstruct and improve the other sections of the Kowloon-bound and the entire Tuen Mun-bound carriageways under this proposal.

8. The annual maintenance cost per unit area for TMR is almost twice that for the adjacent Yuen Long Highway and San Tin Highway. Maintenance works for TMR have become more frequent. There were 74 lane closures on the TMR for resurfacing works during the past year as compared with 33 and 17 on the Yuen Long Highway and San Tin Highway respectively. The recently completed Strategic Highway Project Review indicates that the capacity of TMR will effectively be reduced owing to the dilapidation of the carriageway, necessitating frequent ad-hoc repairs. Reconstruction of the at-grade sections of the highway is required to curb escalating maintenance costs and to minimise unscheduled repairs which can cause serious traffic disruption.

¹ The design life of at-grade road sections is 20 years. The design life of highway bridge structures is 120 years. We propose reconstruction of all at-grade sections of the road under this project.

² Improvement works are being carried out under **520TH** at an estimated cost of \$1,324.6 million in MOD prices. The works for the concerned four sections include the construction of a climbing lane and a standard hard shoulder, and the upgrading of lane widths to expressway standard, with a total length of eight kilometres. We expect to complete the improvement works in May 2001.

9. The existing traffic lanes of the TMR are 3.3 to 3.5 metres wide, and are below the current standard of 3.65 metres for expressways. There is no hard shoulder on most sections of the road to cater for broken down vehicles, maintenance works, etc or to provide unobstructed passage for emergency vehicles. Widening of the lane widths to the current standard and provision of hard shoulders are necessary to improve traffic flow and to enhance road safety. We also propose to replace the existing metal crash barriers along TMR with concrete profile barriers for safety reasons.

10. The current slip roads at the existing TMR interchanges at Sham Tseng and Siu Lam are too short and abrupt to meet the latest traffic engineering standards. Lengthening the roads will improve traffic merging between the slip roads and the TMR. Motorists will be able to enter and exit the TMR via the interchanges more smoothly and safely.

11. The existing TCSS consists of CCTV cameras and emergency telephones only. A study on the provision, management and operation of TCSS facilities for the strategic road network completed by the Transport Department in September 1999 recommended the provision of a complete TCSS, which includes CCTV cameras, fibre optic communication cabling, speed enforcement cameras, variable message signs and lane control signals, for all new and existing highways in the strategic road network. As the TMR is part of strategic Route 2 in the Northwest New Territories, we propose to upgrade the TCSS along the road to enhance traffic and incident management capabilities.

12. We need to proceed with the investigation and preliminary design for the project to establish land requirements and assess environmental, marine, drainage and traffic impacts on the areas concerned. Such information is essential to define the scope of the project and provide input for subsequent detailed design. We will also carry out associated ground investigations to collect the necessary site data. As we do not have the necessary in-house resources, we propose to employ consultants to undertake the investigation and preliminary design and to supervise the associated ground investigation works.

FINANCIAL IMPLICATIONS

13. We estimate the cost of this proposal to be \$37.8 million in MOD prices, made up as follows -

		\$ million	
(a)	Consultants' fees	18.1	
	(i) investigation and preliminary design	16.4	
	(ii) supervision of ground investigations	1.5	
	(iii) Electrical and Mechanical Services Trading Fund (EMSTF) charges ³	0.2	
(b)	Ground investigations	16.9	
(c)	Contingencies	3.5	
	Sub-total	38.5	(at September 2000 prices)
(d)	Provision for price adjustment	(0.7)	
	Total	37.8	(in MOD prices)

³ Upon its establishment from 1 August 1996 under the Trading Funds Ordinance, the EMSTF charges government departments for design and technical consultancy services for electrical and mechanical (E&M) installation. The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the project. The figure above is based on estimates prepared by the Director of Highways. The actual cost is subject to further negotiation with the EMSD.

A breakdown by man-months of the estimate for consultants' fees is at Enclosure 2.

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

Year	\$ million (Sept 2000)	Price Adjustment Factor	\$ million (MOD)
2001 – 2002	1.0	0.98000	1.0
2002 – 2003	31.5	0.97976	30.9
2003 – 2004	6.0	0.98759	5.9
	38.5		37.8

15. We have derived the MOD estimate on the basis of the Government's forecast of trend labour and construction prices for the period 2001 to 2004. We will award the consultancy on a lump sum basis with provision for adjustment due to inflation as the duration of the consultancy will exceed 12 months. The consultants will supervise the ground investigation works under a contract to be awarded through normal competitive tendering procedures.

16. The proposed investigation and preliminary design will not give rise to any annual recurrent expenditure.

PUBLIC CONSULTATION

17. We briefed the Traffic and Transport Committee of the Tuen Mun District Council on the project on 9 March 2001. Whilst Members supported this project, they were concerned about the ability of the TMR to cope with the extra traffic from the slip roads of Route 10, traffic impact during construction and the need to include measures to enhance the capacity of the TMR. These concerns will be studied in the investigation consultancy. We will consult the Tsuen Wan, Tuen Mun and Yuen Long District Councils at an appropriate time before the completion of the investigation consultancy.

18. The LegCo Panel on Transport discussed the project on 7 May 2001. Members gave useful comments on various areas including traffic management measures during construction, landscaping, environmental impact and design standard which we will take into account during the investigation and preliminary design stage. The Panel agreed that the funding proposal could be put forward to this Subcommittee for consideration.

ENVIRONMENTAL IMPLICATIONS

19. We completed a Preliminary Environmental Review (PER) for the project in May 1999. The PER concluded and the Director of Environmental Protection agreed that an Environmental Impact Assessment would not be necessary. We shall include in relevant contracts standard pollution control clauses for dust, noise and site run-off nuisance during construction. The current proposed consultancy on the investigation and preliminary design of the reconstruction and improvement of TMR will not have any adverse environmental implications.

20. The proposed consultancy and site investigation works will only generate a negligible amount of construction and demolition materials. We will require the consultant to fully consider measures to minimize the generation of such materials during construction stage and to reuse/recycle them as much as possible.

LAND ACQUISITION

21. The proposed investigation and preliminary design work does not require any land acquisition.

BACKGROUND INFORMATION

22. We upgraded **746TH** to Category B in September 2000.

23. We will need to implement traffic diversions for the above works. To minimise disruption to traffic, we will investigate the need to maintain three traffic lanes in each direction during weekday peak hours. For the safety of road users, we will consider reducing the speed limit on the diverted carriageway and study the extent of speed reduction required in more detail with other temporary traffic arrangements as part of the investigation consultancy. We will also

investigate, taking into account the programme of other projects in the vicinity, the practicality of phasing the works along all 15.5 kilometres of highway so as to limit the extent of road affected at any one time. Traffic management measures and public transport services arrangements, particularly in emergency situations, will be given careful consideration.

24. We estimate that the proposed ground investigation and preliminary design works would create about 60 jobs or 410 man-months, comprising 25 professional/technical staff and 35 labourers.

Transport Bureau
May 2001

746TH – Reconstruction and improvement of Tuen Mun Road

Breakdown of estimates for consultants' fees (at September 2000 prices)

		Estimated man- months	Average MPS* salary point	Multiplier factor	Estimated fee (\$million)
Consultants' staff costs					
(a) Review of the findings of previous studies, and examination of alignments and design options	Professional	10	38	2.4	1.4
	Technical	20	14	2.4	0.9
(b) Impact assessments	Professional	24	38	2.4	3.3
	Technical	36	14	2.4	1.6
(c) Determination of land requirement	Professional	4	38	2.4	0.6
	Technical	4	14	2.4	0.2
(d) Preliminary design	Professional	40	38	2.4	5.5
	Technical	64	14	2.4	2.9
(e) Supervision of ground investigations	Professional	10	38	1.7	1.0
	Technical	14	14	1.7	0.5
(f) EMSTF charges					0.2
Total consultants' staff costs					18.1

* 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. (At 1.4.2000, MPS pt. 38 = \$57,525 p.m. and MPS pt. 14 = \$19,055 p.m.) A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants.
2. The figures given above are based on estimates prepared by the Director of Highways. We will only know the actual man months and actual fees when we have selected the consultants through the usual competitive lump sum fee bid system.