

**For discussion  
on 19 December 2008**

**Legislative Council Panel on Transport**

**Hong Kong – Zhuhai – Macao Bridge Main Bridge**

**PURPOSE**

This paper updates Members on the progress of the planning work for the Hong Kong – Zhuhai – Macao Bridge (HZMB) and seeks Members' support for the funding application to be made to the Public Works Subcommittee (PWSC) and the Finance Committee (FC) for the funding support for the preliminary design and site investigation for the HZMB Main Bridge<sup>1</sup>.

**BACKGROUND**

2. In January 2003, the National Development and Reform Commission (NDRC) and the Government of Hong Kong Special Administrative Region (HKSAR) jointly commissioned the Institute of Comprehensive Transportation to conduct a study entitled "Transport Linkage between Hong Kong and Pearl River West". The study confirmed the strategic significance of and urgent need for the construction of a land transport link between the HKSAR and the Pearl River West.

3. The governments of Guangdong, the HKSAR and the Macao Special Administrative Region (Macao SAR) have since 2003 formed a HZMB Advance Work Coordination Group (AWCG) to commence the preparatory work for the HZMB. In 2004, the AWCG commissioned the China Highway Planning and Design Institute (HPDI) to conduct a feasibility study on the HZMB, covering a wide range of topics including navigation clearance, hydrology, environment, traffic, economic benefits and financial viability. A total of nine AWCG meetings and numerous expert group meetings have been held to deliberate on the outcome of the various topical studies. The NDRC also formed a HZMB

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<sup>1</sup> The HZMB Main Bridge will start from the artificial islands off Gongbei and Macao to the eastern artificial island west of the HKSAR boundary. It will be a 29.6km dual 3-lane carriageway running across major navigation channels in the Pearl River Estuary with an immersed tunnel of about 6.7km.

Task Force in 2007 to push forward the project. The Task Force was led by the NDRC, with representatives from the Ministry of Transport, the Hong Kong and Macao Affairs Office, and the governments of the HKSAR, Guangdong and the Macao SAR as members. At its meeting on 7 January 2007, the Task Force recommended that the Boundary Crossing Facilities (BCF) of each government should be set up within their own respective territories (三地三檢).

4. At the 8<sup>th</sup> AWCG Meeting held on 28 February 2008, a consensus was reached on the financing arrangement and construction option for the HZMB project. Each of the three governments of the HKSAR, Guangdong and the Macao SAR will be responsible for the construction, operation and maintenance of the link roads and BCF within their respective territories and will, if necessary, contribute to the funding gap of the HZMB Main Bridge to be tendered under a Build, Operate and Transfer (BOT) franchise.

5. We last briefed the Legislative Council Panel on Transport (the Transport Panel) on 25 April and 16 May 2008 on the progress of the planning work for the HZMB, the Hong Kong Boundary Crossing Facilities (HKBCF) and the Link Road in Hong Kong. On 6 June 2008, the Finance Committee approved funding of \$86.9 million to engage consultants to undertake the investigation and preliminary design for the HKBCF, and \$46.6 million to carry out preconstruction works for the HZMB jointly with the governments of Guangdong Province and the Macao SAR.

## **LATEST DEVELOPMENT**

6. In August 2008, the three governments agreed to take up the responsibility for the construction of the HZMB Main Bridge, instead of seeking private investment to implement the project under a BOT franchise. The Mainland, Hong Kong and Macao governments will contribute RMB ¥7.0 billion, RMB ¥6.75 billion and RMB ¥1.98 billion respectively to the project cost of the Main Bridge. The total contributions from the three sides will be RMB ¥15.73 billion, which is about 42% of the project cost of the Main Bridge. The remaining 58% will be financed by loans.

7. The advantages of the financing arrangement proposed in paragraph 6 above are as follows:

- (a) since there is no need to invite tenders from private investors and conduct negotiations on the franchise, the submission of the feasibility study report to the Central People's Government (CPG) could be accelerated, resulting in much greater certainty in the programme and earlier completion of the HZMB;
- (b) there will be more time for the three governments to discuss the regulatory arrangements for cross-boundary private cars as such discussion can proceed in parallel with the construction works;
- (c) the governments will have better control over the toll levels to meet public expectations as far as possible.

8. The governments of Guangdong, HKSAR and the Macao SAR have endorsed the feasibility study report prepared by the HPDI and will endeavor to submit it to the CPG in December 2008 for consideration. Tender for the preliminary design and site investigation for the Main Bridge was invited on 1 December 2008. Our aim is to start the preliminary design in April 2009.

9. To explore possible options for financing the remaining 58% of the project cost of the HZMB Main Bridge, financial institutions in the Mainland, Hong Kong and Macao were invited in October 2008 to express interest in the provision of loan facilities. A total of 34 responses were received. These responses from the financial institutions revealed that the remaining 58% of the project cost can be financed via, for example, syndicated loan arrangements, although some form of government guarantee for repayment may be required. The three governments will work together in finalizing the financing arrangement for the Main Bridge.

## **REGULATORY ARRANGEMENTS FOR CROSS-BOUNDARY PRIVATE CARS**

10. We have been considering means to broaden the availability and flexibility of cross-boundary travel for private cars. Our intention is to introduce ad hoc quotas for cross-boundary private cars in a gradual and controlled manner taking into account the handling capacity of our road networks. We have already had preliminary exchanges of views on this idea with the Guangdong side. The two sides have agreed to set up an expert group

to examine the feasibility of ad hoc quotas with a view to drawing up an implementation framework. In the course of doing so, we will consider the operational (e.g. application procedures, allocation criteria, insurance etc), environmental, traffic safety and security issues. Our aim is to roll out a trial scheme at the Shenzhen Bay Port as soon as possible. The trial, if proven successful, will pave way for future implementation at the HZMB.

### **FUNDING SUPPORT FOR HZMB MAIN BRIDGE**

11. In order to commence the construction work for the HZMB Main Bridge as soon as possible and no later than 2010, our plan is to commence its preliminary design in April 2009 following the tender mentioned in paragraph 8 above.

12. We intend to submit a paper to the Public Works Subcommittee (PWSC) in January 2009 proposing to partially upgrade 3QR-“Hong Kong – Zhuhai – Macao Bridge – funding support for Main Bridge” to Category A at an estimated cost of \$233.5 million (in money-of-the-day prices) to provide the HKSAR’s share of funding support for the preliminary design and site investigation. The draft PWSC paper is at **Enclosure**. The amount of funding to be sought is in accordance with the split of the governments’ subsidy to the project cost of the Main Bridge as determined in accordance with the principle of Equalization of Benefit to Cost Ratio<sup>2</sup>, with Hong Kong contributing 50.2%, Guangdong 35.1% and Macao 14.7% of the subsidy.

### **ADVICE SOUGHT**

13. Members are invited to provide views on the project and indicate support for the application for the funding support for the preliminary design and site investigation for the HZMB Main Bridge.

Transport and Housing Bureau  
December 2008

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<sup>2</sup> Equalization of Benefit to Cost Ratio is an approach to equalize the ratio of the estimated benefit obtained to the estimated cost incurred for a joint investment from different territories with different economic status. Under this principle, the amount of contribution by the three governments to the cost of the HZMB Main Bridge should be apportioned in such a way that the Benefit to Cost Ratio of the three territories is the same.

For discussion  
on **21 January** 2009

PWSC(2008-09)**xx**

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

### **HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT**

#### **Subventions – Miscellaneous**

#### **3QR – Hong Kong–Zhuhai–Macao Bridge – funding support for Main Bridge**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of 3QR, entitled “Hong Kong-Zhuhai-Macao Bridge – funding support for preliminary design and site investigation for the Main Bridge”, to Category A at an estimated cost of \$ 233.5 million in money-of-the-day prices; and
- (b) the retention of the remainder of 3QR in Category B.

### **PROBLEM**

We need to carry out jointly with the governments of Guangdong Province and the Macao Special Administrative Region (Macao SAR) the preliminary design and site investigation for the Hong Kong–Zhuhai–Macao Bridge (HZMB) Main Bridge.

### **PROPOSAL**

2. The Director of Highways (D of Hy), with the support of the Secretary

for Transport and Housing, proposes to upgrade part of **3QR** to Category A at an estimated cost of \$ 233.5 million in money-of-the-day (MOD) prices to fund the Government of the Hong Kong Special Administrative Region (HKSAR)'s share for the engagement of consultants to undertake the preliminary design and site investigation for the HZMB Main Bridge.

### **PROJECT SCOPE AND NATURE**

3. The scope of 3QR (the Project) comprises a capital grant as the HKSAR Government's share of funding support to make the HZMB Main Bridge project financially viable. The provision of the HKSAR Government's share of the funding support will fund part of the project cost of the HZMB Main Bridge for-

- (a) construction of a 29.6 kilometres (km) dual three-lane carriageway in the form of bridge-cum-tunnel structure comprising a tunnel of about 6.7 km;
- (b) forming of two artificial islands for the tunnel landings west of the HKSAR boundary;
- (c) associated works include civil and structural, environmental mitigation, drainage, electrical and mechanical (E&M); and
- (d) operation of the management body of the HZMB Main Bridge until the commissioning of the HZMB. A management body of the HZMB Main Bridge will be set up under the command of the three governments for implementing the Main Bridge.

A plan showing the indicative alignment of the HZMB Main Bridge is at  
———— the **Enclosure**.

4. The HZMB Main Bridge runs from the artificial islands off Gongbei of Zhuhai and Macao to the eastern artificial island just west of the HKSAR boundary. The HZMB Main Bridge and other associated works are therefore all within the Mainland waters. The part of the Project we now propose to upgrade

to Category A is the provision of the part of the funding support for-

- (a) preliminary design;
- (b) site investigation and site supervision;
- (c) initial operation of the management body of the HZMB Main Bridge including set up, running cost and staff cost, etc for the period from its establishment to the commencement of the detailed design of the HZMB Main Bridge; and
- (d) miscellaneous items, including setting up of the information management system and relevant studies such as further geotechnical assessment, impact test on vehicular parapet, wind tunnel test for long span bridges and risk assessment for construction etc.

5. We plan to commence the preliminary design of the HZMB Main Bridge in April 2009. We intend to commence the construction work of the HZMB Main Bridge as soon as possible, and no later than 2010.

## **JUSTIFICATION**

6. The governments of Guangdong, the HKSAR and the Macao SAR have since 2003 formed an HZMB Advance Work Coordination Group (AWCG) to commence the preparatory work for the HZMB. In 2004, the AWCG commissioned the China Highway Planning and Design Institute (HPDI) to conduct a feasibility study on the HZMB. The National Development and Reform Commission (NDRC) also formed an HZMB Task Force in 2007 to push forward the project. The Task Force was led by the NDRC, with representatives from the Ministry of Transport, the Hong Kong and Macao Affairs Office, and the governments of the HKSAR, Guangdong and the Macao SAR as members. At its meeting on 7 January 2007, the Task Force recommended that the Boundary Crossing Facilities (BCF) of each government should be set up within their respective territories.

7. At the 8<sup>th</sup> AWCG Meeting held on 28 February 2008, a consensus was

reached on the financing arrangement and construction option for the HZMB project. Each of the three governments of the HKSAR, Guangdong and the Macao SAR will be responsible for the construction, operation and maintenance of the link roads and BCF within their respective territories and will, if necessary, contribute to the funding gap of the HZMB Main Bridge to be tendered under a Build, Operate and Transfer (BOT) franchise.

8. In August 2008, the three governments agreed to take up the responsibility for the construction of the HZMB Main Bridge, instead of seeking private investment to implement the project under a BOT franchise. The Mainland, Hong Kong and Macao governments will contribute RMB ¥7.0 billion, RMB ¥6.75 billion and RMB ¥1.98 billion respectively to the project cost of the Main Bridge. The total contributions from the three sides will be RMB ¥15.73 billion, which is about 42% of the project cost of the Main Bridge. The remaining 58% will be financed by loans.

9. The HZMB Main Bridge will necessitate the Hong Kong Boundary Crossing Facilities (HKBCF) and the Hong Kong Link Road (HKLR), which will create about 11,000 jobs during the construction stage.

10. The governments of the HKSAR, Guangdong and the Macao SAR have endorsed the feasibility study report prepared by the HPDI and will endeavor to submit it to the Central People's Government in December 2008 for consideration. Tender for the preliminary design and site investigation for the Main Bridge was invited on 1 December 2008. Our aim is to start the preliminary design in April 2009.

11. As part of the project cost, the cost of the preliminary design and site investigation, and the initial operation of the management body of the HZMB Main Bridge will be shared by the three governments according to the agreed principle of Equalization of Benefit to Cost Ratio<sup>1</sup>. The management body of the HZMB Main Bridge will be set up in 2009 for the implementation of the HZMB Main Bridge. After completion of the preliminary design, tendering process for the detailed design will be started immediately.

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<sup>1</sup> Equalization of Benefit to Cost Ratio is an approach to equalize the ratio of the estimated benefit obtained to the estimated cost incurred for a joint investment from different territories with different economic status. Under this principle, the amount of contribution by the three governments to the cost of the HZMB Main Bridge should be apportioned in such a way that the Benefit to Cost Ratio of the three territories is the same.



## REGULATORY ARRANGEMENTS FOR CROSS-BOUNDARY PRIVATE CARS

12. We have been considering means to broaden the availability and flexibility of cross-boundary travel for private cars. Our intention is to introduce ad hoc quotas for cross-boundary private cars in a gradual and controlled manner taking into account the handling capacity of our road networks. We have already had preliminary exchanges of views on this idea with the Guangdong side. The two sides have agreed to set up an expert group to examine the feasibility of ad hoc quotas with a view to drawing up an implementation framework. In the course of doing so, we will consider the operational (e.g. application procedures, allocation criteria, insurance etc), environmental, traffic safety and security issues. Our aim is to roll out a trial scheme at the Shenzhen Bay Port as soon as possible. The trial, if proven successful, will pave way for future implementation at the HZMB.

## FINANCIAL IMPLICATIONS

13. We estimate the HKSAR's share of capital cost of the preliminary design and site investigation for the HZMB Main Bridge to be \$ 233.5 million in MOD prices (see paragraph 14 below), made up as follows –

	<b>\$ million</b>
(a) Consultants' fees	153.8
(i) Preliminary design for the HZMB Main Bridge (including bridge and tunnel structures, artificial islands, ship impact protection works, E&M equipment, bridge appearance, construction sequence and methodology etc.)	103.0

(ii) Miscellaneous	47.5	
(including setting up of the information management system and relevant studies such as further geotechnical assessment, impact test on vehicular parapet, wind tunnel test for long span bridges and risk assessment for construction)		
(iii) Supervision of site investigation	3.3	
(b) Site investigation		33.2
(c) Initial operation of the management body of the HZMB Main Bridge (including set up, running cost and staff cost etc for the period from its establishment to the commencement of the detailed design of the HZMB Main Bridge)	6.0	
(d) Contingencies		19.3
	Sub-total	<u>212.3</u>
(e) Provision for Renminbi fluctuation	21.2	
	Total:	<u>233.5</u> (in MOD prices)

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

Year	\$ million (MOD)
2009 – 2010	111.8
2010 – 2011	121.7
	<hr/>
	233.5
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15. We have made a provision to cater for fluctuation of Renminbi exchange rate. We consider that the \$21.2 million provision should be sufficient for the purpose. The contract for the preliminary design consultancy will be awarded on a lump-sum basis without provision for price adjustment.

16. The proposed preliminary design and site investigation for the HZMB Main Bridge will have no recurrent financial implication.

## **PUBLIC CONSULTATION**

17. We briefed the Members of the Legislative Council Panel on Transport (the Panel) on the progress of the HZMB project on 29 September and 24 October 2003. On 25 June 2004, we briefed the Panel on the commissioning of HPDI by the AWCG to conduct the feasibility study for the HZMB. We also informed the Panel of the setting up of a Project Office in Guangzhou to monitor the conduct of the feasibility study for the HZMB. On 27 May 2005, we informed Members of the Panel of the latest developments of the HZMB, and consulted them on the proposed **796TH** “Hong Kong-Zhuhai-Macao Bridge - conceptual design and advance technical studies” (see paragraph 28 below).

18. On 13 October 2003, we briefed the Advisory Council on the Environment (ACE) on the HZMB project, and the choice of location for the landing point and alignments of the HZMB. The ACE supported our proposal to conduct further studies on the proposed landing points and alignments. We consulted the ACE again on 18 April 2005 and the representatives of the World Wide Fund, Friends of the Earth, Green Power, the Conservancy Association, Green Lantau Association, the Living Islands Movements and Save our Shorelines in April 2005 on the landing point of the HZMB.

19. On 25 April and 16 May 2008, we updated Members of the Panel on the progress of the planning work for the HZMB, the HKBCF and the HKLR and sought their support for the funding applications for the investigation and preliminary design for the HKBCF as well as preconstruction works for the HZMB. The Finance Committee approved the funding applications at its meeting on 6 June 2008.

20. We consulted the Panel on 19 December 2008 regarding our plan to submit the funding support application for the preliminary design and site investigation of the HZMB Main Bridge. Members showed their support for the funding application. [\[To be confirmed\]](#)

## **ENVIRONMENTAL IMPLICATIONS**

21. The proposed preliminary design and site investigation works will not give rise to significant adverse environmental impacts, and will only generate very little construction waste. The consultants will fully consider measures to minimize the generation of construction waste and to reuse/recycle construction waste as much as possible in the future implementation of the construction projects.

22. The HZMB Main Bridge project site is outside the HKSAR boundary and hence the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) will not apply.

23. An environmental assessment for the HZMB project has been carried out. Key environmental issues including air quality, water quality, noise, ecological impacts and visual impact along the proposed alignment of the HZMB Main Bridge in the Pearl River Estuary were reviewed and assessed to meet the requirements under Mainland laws.

## **HERITAGE IMPLICATIONS**

24. The proposed preliminary design and site investigation works for the HZMB Main Bridge will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological

interests and Government historic sites within the HKSAR boundary identified by the Antiquities and Monuments Office.

## LAND ACQUISITION

25. The proposed preliminary design and site investigation works for the HZMB Main Bridge do not require any land acquisition within the HKSAR boundary.

## BACKGROUND INFORMATION

26. In January 2003, D of Hy included an item under **Subhead 6100TX** “Highway works, studies and investigations for items in Category D of the Public Works Programme” to fund HKSAR’s share of the cost for the Institute of Comprehensive Transportation (ICT) to conduct a study entitled “Transport Linkage between Hong Kong and Pearl River West” at a cost of \$800,000. The ICT completed the study in July 2003.

27. In March 2004, we included an item under **Subhead 6100TX** at an estimated cost of \$11.0 million in MOD prices to fund HKSAR’s share of the cost for the HPDI to conduct the feasibility study for the HZMB. In April 2005, we increased the Approved Project Estimate (APE) of this item by \$900,000 to \$11.9 million to provide fund for HKSAR’s share of the cost for the HPDI to carry out some additional topical studies for the feasibility study. In September 2006, we further increased the APE of this item by \$2.3 million to \$14.2 million to conduct supplementary studies for completing the feasibility study of the HZMB. Upon substantial completion of the supplementary studies, HPDI completed the HZMB feasibility study report, which was endorsed by the AWCG in November 2008.

28. In June 2005, we upgraded **796TH** to Category A at an estimated cost of \$26.8 million in MOD prices to provide fund for HKSAR’s share of the cost for the conceptual design and advance technical studies for the HZMB. These include the environmental impact assessment for the Main Bridge, further site investigation works, the collection of design data on wind speed and sea wave, the compilation of design guidelines, construction specifications, maintenance and operation requirements, and acceptance standards as well as the cost estimation for construction works in oceanic condition. The advance technical studies are

in good progress and provide useful information for the future preliminary design and tender preparation works.

29. In June 2008, we upgraded **835TH** to Category A at an estimated cost of \$46.6 million in MOD prices to provide fund for HKSAR's share of the cost for some preconstruction works for the HZMB, which includes physical modelling studies and design refinement for the HZMB. The studies and design refinement works are in good progress for future preliminary design.

30. We included **3QR** in Category B in December 2008.

31. The proposed preliminary design and site investigation for the HZMB Main Bridge will not directly involve any tree removal or planting proposals in the HKSAR.

32. The proposed preliminary design and site investigation works for the HZMB Main Bridge will be carried out in the Mainland. However, suitable consultants in Hong Kong may also submit tenders in the form of joint venture with Mainland consultancy firms for the preliminary design and site investigation works for the HZMB Main Bridge. This should create some jobs in Hong Kong.

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Transport and Housing Bureau  
January 2009

**圖例**  
LEGEND

大橋主體  
MAIN BRIDGE

— 擬建橋樑  
PROPOSED BRIDGE

- - - 擬建隧道  
PROPOSED TUNNEL



圖則名稱 drawing title

工務計劃項目第XXX號 - 港珠澳大橋 - 主橋撥款資助  
PWP ITEM NO. XXX - HONG KONG-ZHUHAI-MACAO BRIDGE - FUNDING SUPPORT FOR MAIN BRIDGE

設計 designed W H YIP 25/11/08	繪圖 drawn K L LEUNG 25/11/08	圖則編號 drawing no. HZM6835TH-SK0006	比例 scale 不按比例 N.T.S.
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