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2 May 2012

Clerk to Panel on Transport
Legislative Council Complex
1 Legislative Council Road
Central
Hong Kong
(Attn: Ms. Joanne Mak)

Dear Ms. MAK,

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road

Supplementary Information

In response to the request of the Panel on Transport of the Legislative Council made at the meeting on 25 April 2012, supplementary information prepared by the Administration on the Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road is attached at the Annex for Members' reference.

Yours sincerely,

(Kilian TUNG)
for Secretary for Transport and Housing

c.c.

Clerk to Public Works Subcommittee (Attn: Mr. Derek LO)
FSTB (Attn: Ms. Ivy CHAN)
HyD (Attn: Mr. CW Chow)

Hong Kong-Zhuhai-Macao Bridge
Hong Kong Link Road

Supplementary Information

At the meeting of the Legislative Council (LegCo) Panel on Transport on 25 April 2012, Members requested the Administration to provide supplementary information on the Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Link Road for the reference of the Public Works Subcommittee meeting to be held on 7 May 2012. The supplementary information is provided in ensuing paragraphs.

(I) Estimated Funding Required for HZMB Local Projects

2. The HZMB related local projects include the Hong Kong Link Road (HKLR), Hong Kong Boundary Crossing Facilities (HKBCF), Tuen Mun-Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB). The Finance Committee (FC) of LegCo, from 2003 till now, has approved funding of $49,389.7 million (in money-of-the-day (MOD) prices) for the site investigation and preliminary design work for the various projects, as well as detailed design and site investigation work and construction works for some of the projects (refer to Appendix for detailed information).

3. Among the said funding approved, 6.5 billion was the cost increase for the HKBCF and the reclamation works of TM-CLKL due to the one year delay caused by the judicial review case. As there was a difference of about one year compared to the original commencement timetable for the local projects, the contractor has to adjust the construction methods to compress the works timetable. There was also an increase in construction price levels during the delay. However, we stated clearly that the 6.5 billion did not include the cost increase for the HKLR (the tendering process of which was on-going) due to the delay in commencement when we applied funding for the HZMB local works in November 2011.

4. The higher-than-expected tender prices of the HKLR are a result of two main factors caused by the delay in commencement of works: the surge in construction prices in the past six months after the delay; and the fact that tenderers are more conservative in assessing risks of works than we expected. It is necessary for us to increase the approved project vote by $8,857.3 million from

$16,189.9 million to $25,047.2 million in MOD prices. If the funding application is approved, the FC will have approved 58,247 million for the HZMB local projects.

5. The projects that we have yet to apply for funding include the construction fees for the remaining works of the TM-CLKL (including construction of the southern viaduct section of 4 km long, northern sub-sea tunnel section of 5 km long and associated works) and the detailed design and construction fees for the TMWB. As regards the remaining works of the TM-CLKL, as the detailed design is underway, it is difficult to estimate the cost accurately. The TM-CLKL involves a number of complicated works, including the construction of about 5 km of sub-sea tunnel and about 4 km of viaducts as well as reclamation for the construction of the northern landfall of the sub-sea tunnel, etc. For the sub-sea tunnel, we propose to adopt the more environmentally friendly construction method using tunnel boring machine instead of the traditional immersed-tube method. This is a large-scale and complex construction method in view of the length of the tunnel. We can only have a more accurate estimate on the project costs after the completion of the detailed design. However, in response to Members' request, we have made a very rough estimate based on the information we have obtained in the investigation and preliminary design stage. We estimate that the TM-CLKL's remaining works might need about $45 billion to $50 billion in MOD prices. Nevertheless, we must reiterate that the project details and cost estimate of the TM-CLKL are yet to be finalized and they may be adjusted upon completion of the detailed design. We are continuing with the detailed design work of the TM-CLKL and will invite tenders following the established procedures. By then, we will have a more accurate estimate on the cost.

6. For the TMWB project, the HyD has been conducting extensive public consultations since October 2008, and has collected different views on the alignment from various sources. Based on the views collected, we have considered ten different alignment options. Through detailed discussions with the stakeholders, we have selected the current recommended alignment amongst the ten options. The HyD is now proceeding with the traffic impact assessment, environmental impact assessment, site investigation and preliminary design for the TMWB project. As the project is still in the preliminary design stage, we do not intend to estimate the construction cost at this moment. We will complete the preliminary design as soon as possible. The practical details of the project will be better known after entering the detailed design process.

(II) Evaluation of Economic Benefits of HZMB and Split of Cost Contribution

(A) Evaluation of Economic Benefits

7. The traffic volume forecast for the HZMB is a key determinant in estimating the magnitude and distribution of the economic benefits arising from the project among the three governments and for the purpose of examining the economic viability of the project. The methodology for the forecast of traffic volume adopted for the project is a four-stage modelling approach for deriving passenger and vehicle flows which is in line with international practice. It uses a systematic method to analyze the complex characteristics of population, travel characteristics, economic growth, foreign trade and transportation network development based upon various statistics and survey data. Based on the future planning data, the predicted passenger and vehicle flows on the HZMB are worked out.

8. The four stages involved in the approach are, namely,

i. **Demand Projection:** i.e. estimating the total cross-boundary passenger trips and cargo volume between Hong Kong and the Mainland, and between Hong Kong and Macao;

ii. **Distribution Pattern Analysis:** i.e. the projection of traffic flows between zones;

iii. **Mode Choice Analysis:** i.e. deciding on the share of travel demand that will choose road transportation as compared to other modes; and

iv. **Route Choice Assignment:** i.e. the prediction of travel demand to specific route, such as the HZMB.

9. Based on the results of the traffic volume forecast with the four-stage methodology, the consultant[1] has evaluated the benefits with the HZMB from savings in transport costs, value of time saved for travellers, induced traffic volume generated between the three territories, and value of time saved for goods on road, etc. The consultant has adopted conservative ranges of traffic and passenger projections in the evaluation. The HZMB will result in a significant reduction in

[1] The three governments has commissioned a consultant to conduct a feasibility study for the HZMB.

relevant traveling time between Hong Kong and the Western Pear River Delta (PRD)[2]. As illustrated by the table below, the travelling time between Zhuhai on the one hand, and the Kwai Chung Container Port and the Hong Kong International Airport on the other, will be reduced by more than 60% and 80% respectively.

Travelling Time Comparison - With and Without HZMB

Origin – Destination	Current Distance and Travelling Time	Distance and Travelling time with HZMB	Reduction in Distance and Travelling Time
Zhuhai – Kwai Chung Container Port	about 200 kilometres about 3.5 hours	about 65 kilometres about 75 minutes	more than 60%
Zhuhai – Hong Kong International Airport	over 200 kilometres about 4 hours	about 40 kilometres about 45 minutes	more than 80%

(B) Direct Economic Benefits

10. Based on the results of the traffic volume forecast with the four-stage methodology, the benefits from savings in transport costs, value of time saved for travellers, induced traffic volume generated between the three territories, and value of time saved for goods on road, etc. have been evaluated under two scenarios, i.e. with and without the HZMB. The economic benefits are then apportioned among the three places, taking into account of the places of origin of the passengers, places of origin and destination of the freight vehicles with estimated economic benefits allocation.

11. It is estimated that the net economic benefits to the three places at discounted present value will be around RMB 40 billion over a 20-year period, with RMB 23 billion for Hong Kong, RMB 13 billion for the Mainland and RMB 4 billion for Macao.

(C) Indirect Economic Benefits

12. The PRD, with about 56 million[3] population, has huge development potential. The HZMB has significant strategic value to the local economies of the

[2] The Western PRD has defined as broadly covering Zhuhai, Jiangmen and Zhongshan.
[3] This figure excludes the population of Hong Kong and Macao.

entire PRD. It will bring substantial indirect economic benefits to Hong Kong, Macao and the PRD (especially the western region).

13. There are at present four road crossings between Hong Kong and PRD, all of which provide connection with the eastern part of the PRD[3]. As a result, most of the business activities, in particular cargo and passenger flows, between Hong Kong and the PRD concentrate on the eastern part. As the eastern PRD can be covered within a three-hour trip from Hong Kong, such geographical advantage has resulted in this part of the PRD attracting the bulk of foreign direct investment.

14. However, most cities in the eastern region[4] are now facing various competitions and challenges in economic development. According to reports, the average monthly wage of staff and workers in 2010 is reportedly at around RMB 2,467 - 4,205 in the eastern PRD, considerably higher than that of RMB 2,291 - 3,382 on the western side. Apart from the ample supply of cheaper labour resources, the western region also has relatively more abundant land yet to be fully exploited, hence significant development potential. The total land area of the eastern PRD is around 4,418 km^2, whereas the area of the western part is almost three times of the eastern part. The HZMB will provide the much needed infrastructure to connect Hong Kong to this area of great development potential.

15. The absence of a direct road link from Hong Kong to Zhuhai has been perceived as one of the reasons that Hong Kong investment in the western PRD has been relatively low compared to that on the east bank. Investing in this less developed region, upon commissioning of the HZMB, should benefit Hong Kong investors, as costs of labour and land resources are cheaper. Hong Kong will also gain from the development of tourism to be brought about by the improved convenience of travelling between Hong Kong and Pearl River West and the increasing spending power of its residents over the coming years as the economy takes off. This close business relationship is beneficial to our external trade and logistics industries, not to mention the ancillary/supporting industries such as finance, transport, warehouse and even insurance etc. We expect similar vigorous economic interactions with the western PRD after the HZMB has been built.

16. Hong Kong will also benefit from an increase of travellers flying in or out of Hong Kong as the HZMB will encourage more visitors to fly to the Hong Kong International Airport and travel to the Mainland via Hong Kong, or vice versa. The proposed HKBCF off the waters at the northeast of the Hong Kong International

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[4] The Western PRD has defined as broadly covering Shenzhen, Huizhou and Dongguan.

Airport will provide a convenient interface between the land and air modes of traffic for the travellers. The HZMB also connects the domestic flight network of Zhuhai airport to the well-established international network of the Hong Kong International Airport, thereby creating synergy for the two airports.

(D) Split of Cost Contribution

17. As already reported to the LegCo Panel on Transport in May 2008 (LegCo document CB(1)1520/07-08(01)), the Hong Kong, Zhuhai and Macao governments agreed to share the construction cost by the ratio of direct benefits received for each government. Though the HZMB brings substantial indirect benefits to the three places, the consultant has only taken into account the direct benefits and not the indirect benefits when calculating the benefit ratio. This is because indirect benefits are not taken into account in general in the calculation of economic benefits for public works projects. After assessing the benefits of the three places, it was concluded that the construction costs should be shared among Hong Kong, Zhuhai and Macao in the same ratio of the benefits (i.e. 57.8 : 32.6 : 9.6). Taking into account the fact that each place has to fund the costs of its own connecting roads individually, the three places agreed that the share of costs of the works of the HZMB Main Bridge (excluding the capital injection form the Central Government) should be adjusted to a ratio of 50.2 (Hong Kong) : 35.1 (Mainland) : 14.7 (Macao). The Central Government also agreed to inject capital when formally sharing the construction cost of the works of the Main Bridge. Taking into account the capital injection of the Central Government, the actual share of cost of the Hong Kong Special Administrative Region Government is RMB 6.75 billion, whereas the mainland government is RMB 7 billion and the Macao government is RMB 1.98 billion.

Transport and Housing Bureau
May 2012

Appendix

Funding approved for the HZMB local works

For the HZMB Main Bridge and related local projects, the FC, up to now, has approved funding of about $49,389.7 million in MOD prices, as follows:

(a) funding of $30,433.9 million (in MOD prices) for the construction of the HZMB HKBCF (approved by the FC in May 2009) (FCR(2011-12)48);

(b) funding of $16,189.9 million (in MOD prices) for the detailed design and construction of the HZMB Hong Kong Link Road (HKLR) (approved by the FC in May 2009) (FCR(2011-12)48);

(c) funding of $ 1,909.6 million (in MOD prices) for engagement of consultants to undertake the detailed design and associated site investigation for the TM-CLKL and to construct the advance TM-CLKL southern landfall reclamation works (approved by the FC in May 2009) (FCR(2011-12)48);

(d) funding of $621.9 million (in MOD prices) for engagement of consultants to undertake detailed design and site investigation of the HZMB HKBCF (approved by the FC in May 2009) (FCR(2009-10)14);

(e) funding of $86.9 million (in MOD prices) for engagement of consultants to undertake site investigation and preliminary design of the HKBCF (approved by the FC in June 2008) (FCR(2008-09)19);

(f) funding of $88.6 million (in MOD prices) for engagement of consultants to undertake site investigation and preliminary design of the TM-CLKL and TMWB (approved by the FC in January 2008) (FCR(2007-08)42); and

(g) funding of $58.9 million (in MOD prices) for investigation and preliminary design of the HZMB Hong Kong Section and North Lantau Highway Connection (now called HKLR) (approved by the FC in December 2003) (FCR(2003-04)45).