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Panel on Transport

Meeting on 16 June 2017

Background brief on Hong Kong-Zhuhai-Macao Bridge and the staffing arrangements of its Hong Kong projects

Purpose

This paper provides background information on the Hong Kong-Zhuhai-Macao Bridge ("HZMB") and its related local infrastructure projects; and the staffing arrangements of the HZMB Hong Kong Project Management Office ("HKPMO"). It also summarizes the major views and concerns expressed by Legislative Council ("LegCo") Members on the staffing arrangements in past discussions.

Background

Hong Kong-Zhuhai-Macao Bridge and its related Hong Kong projects

2. HZMB is a cross-boundary cross-sea mega transport infrastructure project co-built by Guangdong, Hong Kong and Macao. The entire HZMB project consists of two parts:

- (a) the HZMB Main Bridge (i.e. a 22.9 km-long bridge and 6.7 km-long subsea tunnel) situated in Mainland waters which is being taken forward by the HZMB Authority;¹ and
- (b) the link roads and boundary crossing facilities under the responsibility of the three governments.

¹ As advised by the Administration in December 2013, the HZMB Authority had 96 staff members, including one Director, three Deputy Directors and one Chief Engineer, and about 90 technical and general assistants; as each of the three governments had nominated one Deputy Director respectively, all the three sides were directly involved in the construction and management of HZMB, whilst other staff members (including the Director) were from the Mainland.

3. The key HZMB-related Hong Kong projects include the Hong Kong Boundary Crossing Facilities ("HKBCF"), Hong Kong Link Road ("HKLR") and Tuen Mun-Chek Lap Kok Link ("TM-CLKL").² The layout plan of the HZMB Main Bridge and the Hong Kong projects is shown in **Appendix I**.

4. According to the Administration, the construction of HZMB will significantly reduce transportation costs and time for travelers and goods on roads. It has very important strategic value in terms of further enhancement of the economic development between Hong Kong, the Mainland and Macao. With the connection by HZMB, the Western Pearl River Delta will fall within a reachable three-hour commuting radius of Hong Kong.

5. The construction of the HZMB Main Bridge commenced in 2009. The three governments jointly oversee the construction, operation, maintenance and management of the Main Bridge. The construction cost of the Main Bridge is financed by the three governments.³ The three governments are also responsible for the construction, operation and maintenance of their own boundary crossing facilities in their respective territories.

Revised completion dates

6. The HZMB project was originally set for commissioning in end 2016. However, according to the Administration, the HZMB project is huge and complicated, and there have been many technical challenges during both the design and construction stages. In end 2015, the HZMB Authority and the three governments concluded that it would not be feasible for the HZMB project, including the Main Bridge project, to be completed for commissioning in 2016.

7. Subsequently, the Secretary for Transport and Housing ("STH")

² HKBCF is built on reclaimed land of about 130 hectares at the north-eastern waters off the Hong Kong International Airport. HKLR connects the HZMB Main Bridge from the Guangdong-Hong Kong boundary to HKBCF. TM-CLKL comprises two road sections: the Northern Connection of about 5.5 km long (including a subsea tunnel of about 5 km long) linking Tuen Mun Area 40 and HKBCF, and the Southern Connection of about 3.5 km long linking HKBCF and the road network of North Lantau.

³ The Mainland Government will contribute RMB 7 billion yuan, the Hong Kong Special Administrative Region ("SAR") Government RMB 6.75 billion yuan and the Macao SAR Government RMB 1.98 billion yuan. The total contribution of the three sides will be RMB 15.73 billion yuan (accounting for about 42% of the total project cost), with the remaining cost to be financed by bank loans. For Hong Kong side's contribution, the approved project estimates by LegCo of the funding support for the HZMB Main Bridge is HKD \$9.28 billion in total. On 9 February 2017, the Secretary for Transport and Housing announced that the Main Bridge would involve cost overrun but the exact amount, to be shared among the three governments, was to be determined.

advised the Panel on Transport ("the Panel") at the policy briefing held on 15 January 2016 that, in the face of construction difficulties and challenges such as the unstable supply of materials, shortage of labour, restriction in airport height, constraints in environmental protection requirement and the slower-than-expected consolidation performance of reclamation works, etc., the Highways Department ("HyD") assessed that the completion date of the HKBCF and HKLR projects would be deferred to end 2017.

8. At the policy briefing of the Panel held on 20 January 2017, STH further reported that with the consolidated assessment by the Joint Works Committee comprising the three governments, the HZMB Main Bridge was expected to be completed in December 2017, and the three sides strived to complete the entire HZMB project by end 2017 for early simultaneous commissioning subject to factors such as the implementation of cross-boundary transport arrangements. At the Panel meeting on 24 February 2017, the Administration reported that according to the latest works progress, HyD assessed that the Hong Kong projects were targeted to achieve readiness for commissioning by end 2017.

9. As regards TM-CLKL, HyD announced in a press release on 31 October 2016 that due to technical difficulties, the TM-CLKL project could not be completed according to the original plan (i.e. the completion date of the Southern Connection to tie in with that of HZMB, and the Northern Connection in end 2018).⁴ Notwithstanding that, the commissioning of HZMB would not be affected as the traffic between HKBCF and Lantau Island could route through the existing roads on the airport island.

10. Later on 17 March 2017, HyD further announced that based on a preliminary assessment on the latest situation, subject to the technical difficulties being timely overcome and no other unforeseen conditions to arise, all construction works of the Southern Connection were targeted for completion in the first half of 2019 the earliest and that for Northern Connection in 2020.⁵

11. HyD pointed out that of the TM-CLKL project, the works of the Northern Connection Subsea Tunnel Section are the largest and most complicated. The southern landfall of the subsea tunnel would be constructed at the eastern portion of HKBCF artificial island. In view of the actual site conditions, the tunnel alignment below the seawall of the artificial island had to be lowered by about 10 metres to avoid passing through the

⁴ https://www.hyd.gov.hk/en/publications_and_publicity/publicity/press_releases/2016/20161031/20161031.html

⁵ https://www.hyd.gov.hk/en/publications_and_publicity/publicity/press_releases/2017/20170317/20170317.html

stone columns thereat, so as to ensure the safe operation of the tunnel boring machines. Due to this alignment change, the design and construction of the approximately 700-metre-long tunnel section on the artificial island should be amended. In this connection, HyD kept following up with the contractor who was requested to submit a technically feasible and cost-effective design amendment scheme, and expeditiously catch up with the work progress. At this stage, the project contingency is sufficient to cover the additional costs currently anticipated, including the construction cost for a reasonable design amendment scheme.⁶

Recent incidents relating to reclamation works of the Hong Kong projects

12. HKBCF is being built on reclaimed land (i.e. artificial island), which involves the construction of seawalls. Reclamation and construction of seawalls along the eastern shore of the airport island are also required for the construction of associated infrastructures/facilities including HKLR. To reduce the environmental impact of the necessary reclamation, HyD decided to adopt non-dredge reclamation method to reduce sand-filling, release of marine suspended solids, and frequency of marine traffics.

13. In September 2015, there were media reports on the movements of HKBCF artificial island. In response to media enquiries, HyD affirmed in a press release that various amounts of movement had been recorded on the artificial island starting from 2014.⁷ It advised that the consultant had considered and anticipated that some settlement and lateral movement of the reclaimed land would occur during the construction stage, while the movement of the reclaimed land during construction was generally normal. The contractor had carried out remedial measures at its own cost to ensure that the reclaimed land was structurally safe.

14. In February 2017, some media reports revealed irregular extensions of the seawalls in the HKLR reclamation site over two years ago. At the Panel meeting on 24 February 2017, HyD explained that extensions at two locations of the seawalls were discovered in October and November 2014. Yet, settlement and lateral extension of the reclaimed land formed by non-dredge method were common and anticipated during construction. The contractor had carried out strengthening measures at the affected locations at its own cost with no adverse impact on the works programme. At the same time, the contractor enlarged the temporary rock-filled platform, which was built according to the contractor's works design for implementation of the

⁶ On 7 June 2015, the Finance Committee approved the upgrading of part of 825TH, as 857TH, entitled "Tuen Mun-Chek Lap Kok Link – construction works", to Category A at an estimated cost of \$44,798.4 million in money-of-the-day prices.

⁷ https://www.hyd.gov.hk/en/publications_and_publicity/publicity/press_releases/2015/20150925_3/20150925_3.html

non-dredge reclamation method and would be removed after completion of the works, to strengthen stability of the seawalls.

Staffing arrangements for the Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office

15. HKPMO is a dedicated office for overseeing the planning and implementation of HZMB and related highway infrastructure projects. There are four directorate posts (i.e. one Principal Government Engineer ("PGE") post (D3), and three Chief Engineer ("CE") posts (D1)) in HKPMO.

16. The Finance Committee ("FC") approved on 14 May 2004, vide EC(2004-05)4, the creation of two supernumerary posts (i.e. one PGE and one CE), and the redeployment of one permanent CE post in HyD for a period of six years from 1 July 2004 to 30 June 2010 for establishing HKPMO. On 14 May 2010, FC approved vide EC(2010-11)2 the retention of the two supernumerary posts and the extension of the redeployed permanent post for a period of four years from 1 July 2010 to 30 June 2014. Besides, on 13 February 2009, FC approved vide EC(2008-09)16 the creation of one supernumerary CE post to lead a new division in HKPMO to undertake the planning and implementation of HKBCF for a period of five years from 1 April 2009 to 31 March 2014.

17. On 10 January 2014, FC further approved vide EC(2013-14)9 the retention/extension of redeployment of the above four directorate posts in HKPMO with effect from 1 April or 1 July 2014 for up to 31 December 2017 (i.e. for three years and nine months or three years and six months accordingly). An organization chart of HKPMO provided by the Administration to the Establishment Subcommittee ("ESC") in December 2013 is in **Appendix II**.

Major views and concerns of Members

18. The Panel and ESC last examined the staffing proposal of the HZMB project, which was approved by FC on 10 January 2014, at the meetings on 15 November and 4 December 2013 respectively. Members in general supported the staffing proposal to retain experienced staff to take forward HZMB and its related Hong Kong projects.

19. Some members enquired if it was necessary for retaining all three CE posts after commissioning of the HZMB Main Bridge, which was then targeted for end 2016, or might consider extending only one post to handle the associated contract finalization work. There was also a view suggesting the retention of all the four directorate posts till 2018, so as to tie in with the progress of TM-CLKL back then as it had been expected to complete in

phases up to late 2018.

20. In response, the Administration advised that given the complexity of the HZMB local projects, much coordination and maintenance work had to be carried out particularly in the first year after the commissioning of HZMB. As such, the Administration considered it appropriate to retain/extend the relevant CE posts in HKPMO up to one year after the commissioning of HZMB. On the other hand, the Administration considered it more appropriate to review the continued need of the four directorate posts in HKPMO in the second half of 2016 when a more realistic forecast on the staffing requirement could be made, taking into account the latest works progress of the projects and number of claims made.

21. Members expressed concern about the works progress of the HZMB project, and asked about the measures taken or to be taken to control project costs and avoid delay. Some members asked if the incumbents of the four engineer posts would be held responsible for any delay in the works.

22. The Administration advised that in line with established civil service mechanism, staff of HyD was subject to regular performance appraisal. Should further delay in the construction works of the HZMB projects happen, the Administration had to consider whether the delay was caused by controllable or uncontrollable factors so as to make a fair appraisal for the officers concerned.

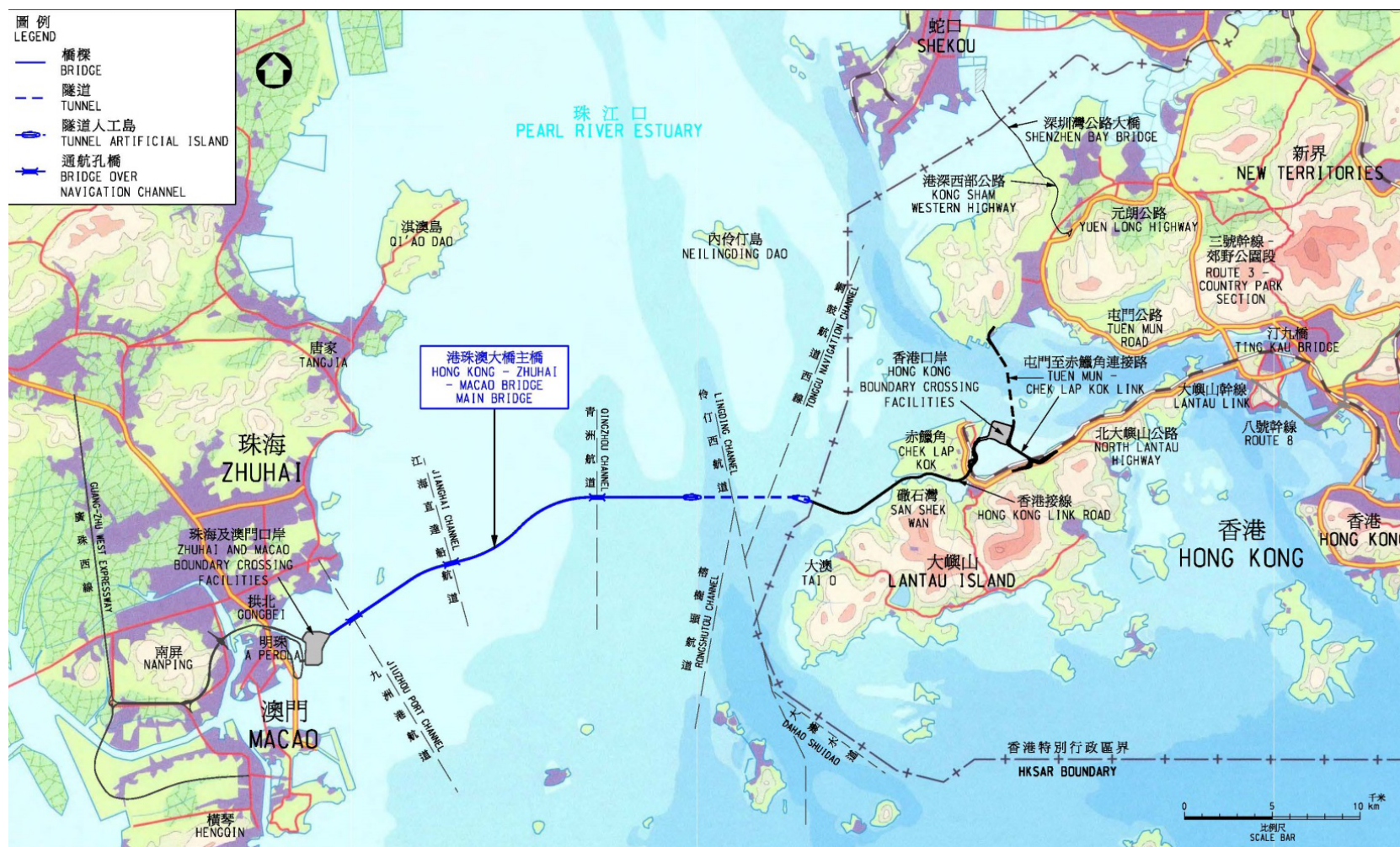
Relevant questions raised at Council meetings

23. From 2014-2015 to 2016-2017 legislative sessions, a total of 14 questions relating to HZMB and its related local infrastructure projects were raised at the Council meetings. The hyperlinks to the questions and the Administration's responses, together with other relevant papers, are in **Appendix III**.

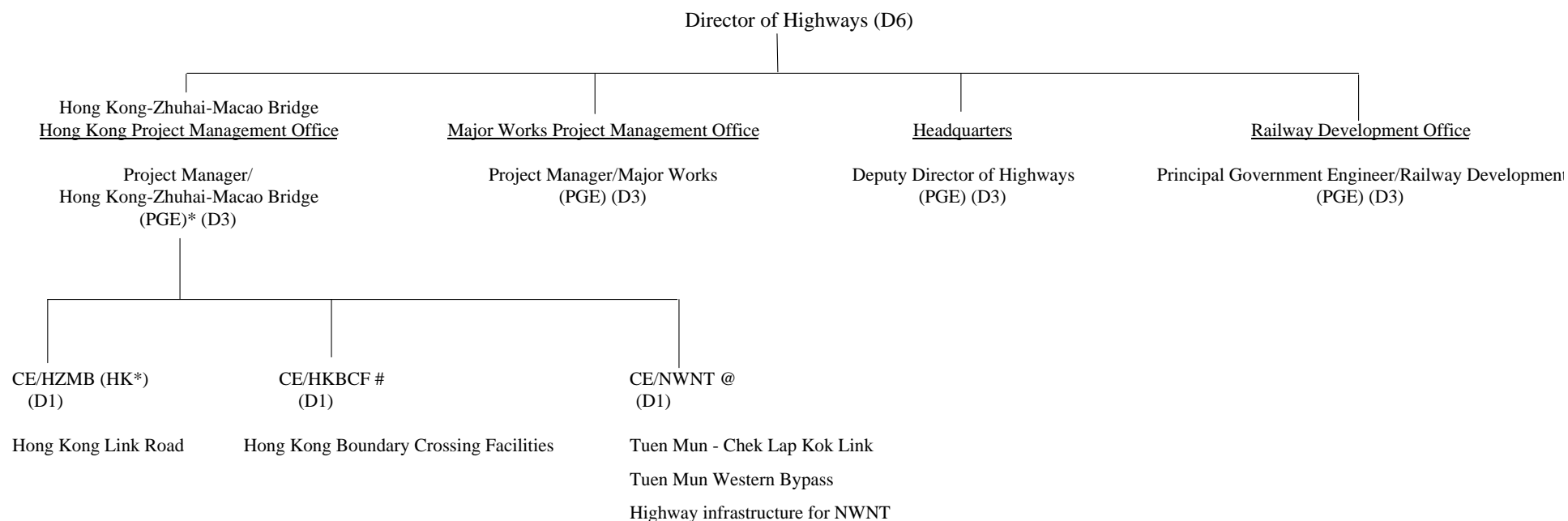
Latest development

24. The Administration plans to seek support for its application to retain/extend the redeployment of the four directorate posts in HKPMO of HyD at the Panel meeting to be held on 16 June 2017.

Legislative Council Panel on Transport

Latest Progress of the Works of the Hong Kong-Zhuhai-Macao Bridge (HZMB) and the Hong Kong Projects**Figure 1: Layout plan for HZMB Main Bridge and the Hong Kong projects**

Existing Organisation Chart of Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office of Highways Department



Legend

CE - Chief Engineer
 HK - Hong Kong
 HKBCF - Hong Kong Boundary Crossing Facilities
 HZMB - Hong Kong-Zhuhai-Macao Bridge
 NWNT - North West New Territories
 PGE - Principal Government Engineer

* - Supernumerary posts (1 PGE and 1 CE) to lapse on 1 July 2014. This paper proposes to retain these two supernumerary posts.
 @ - 1 CE post redeployed from Major Works Project Management Office to Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office on a time-limited basis up to 30 June 2014. This paper proposes to extend the redeployment of this permanent post
 # - Supernumerary CE post to lapse on 1 April 2014. This paper proposes to retain this supernumerary post.

Background brief on Hong Kong-Zhuhai-Macao Bridge and the staffing arrangements of its Hong Kong projects

A. List of relevant papers

Date of meeting	Panel/Committee	Minutes/Paper	LC Paper No.
26.3.2004	Panel on Transport ("TP")	Information paper provided by the Administration	CB(1)1346/03-04(03) http://www.legco.gov.hk/yr03-04/english/panels/tp/papers/tp0326cb1-1346-3e.pdf
		Minutes of meeting	CB(1)1555/03-04 http://www.legco.gov.hk/yr03-04/english/panels/tp/minutes/tp040326.pdf
28.4.2004	Establishment Subcommittee ("ESC")	Administration's paper	EC(2004-05)4 http://www.legco.gov.hk/yr03-04/english/fc/esc/papers/e04-04e.pdf
		Minutes of meeting	ESC32/03-04 http://www.legco.gov.hk/yr03-04/english/fc/esc/minutes/es040428.pdf
14.5.2004	Finance Committee ("FC")	Recommendations of the Establishment Subcommittee	FCR(2004-05)6 http://www.legco.gov.hk/yr03-04/english/fc/fc/papers/f04-06e.pdf

Date of meeting	Panel/ Committee	Minutes/Paper	LC Paper No.
		Minutes of meeting	FC104/03-04 http://www.legco.gov.hk/y r03-04/english/fc/fc/minutes/fc040514.pdf
19.12.2008	TP	Administration's paper on proposed creation of two Chief Engineer posts in the Highways Department	CB(1)406/08-09(04) http://www.legco.gov.hk/y r08-09/english/panels/tp/p apers/tp1219cb1-406-4-e.p df
		Minutes of meeting	CB(1)831/08-09 http://www.legco.gov.hk/y r08-09/english/panels/tp/m inutes/tp20081219.pdf
14.1.2009	ESC	Administration's paper	EC(2008-09)16 http://www.legco.gov.hk/y r08-09/english/fc/esc/pape rs/e08-16e.pdf
		Minutes of meeting	ESC26/08-09 http://www.legco.gov.hk/y r08-09/english/fc/esc/minu tes/esc20090114.pdf
13.2.2009	FC	Recommendations of the Establishment Subcommittee	FCR(2008-09)60 http://www.legco.gov.hk/y r08-09/english/fc/fc/papers /f08-60e.pdf

Date of meeting	Panel/ Committee	Minutes/Paper	LC Paper No.
		Minutes of meeting	FC148/08-09 http://www.legco.gov.hk/yr08-09/english/fc/fc/minutes/fc20090213.pdf
30.3.2010	TP	Administration's paper on proposed retention of two supernumerary posts and extension of redeployment of one permanent post in the Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office of Highways Department	CB(1)1451/09-10(08) http://www.legco.gov.hk/yr09-10/english/panels/tp/papers/tp0330cb1-1451-8-e.pdf
		Minutes of meeting	CB(1)1996/09-10 http://www.legco.gov.hk/yr09-10/english/panels/tp/minutes/tp20100330.pdf
28.4.2010	ESC	Administration's paper	EC(2010-11)2 http://www.legco.gov.hk/yr09-10/english/fc/esc/papers/e10-02e.pdf
		Minutes of meeting	ESC26/09-10 http://www.legco.gov.hk/yr09-10/english/fc/esc/minutes/esc20100428.pdf

Date of meeting	Panel/ Committee	Minutes/Paper	LC Paper No.
14.5.2010	FC	Recommendations of the Establishment Subcommittee made on 28 April 2010	FCR(2010-11)10 http://www.legco.gov.hk/y r09-10/english/fc/fc/papers /f10-10e.pdf
		Minutes of meeting	FC164/09-10 http://www.legco.gov.hk/y r09-10/english/fc/fc/minut es/fc20100514.pdf
15.11.2013	TP	Administration's paper on proposed retention of three supernumerary posts and extension of one permanent post in the Hong Kong-Zhuhai -Macao Bridge Hong Kong Project Management Office of Highways Department	CB(1)268/13-14(01) http://www.legco.gov.hk/y r13-14/english/panels/tp/p apers/tp1115cb1-268-1-e.p df
		Background brief on Hong Kong-Zhuhai-Macao Bridge prepared by the Legislative Council Secretariat	CB(1)268/13-14(02) http://www.legco.gov.hk/y r13-14/english/panels/tp/p apers/tp1115cb1-268-2-e.p df
		Administration's follow-up paper	CB(1)435/13-14(01) http://www.legco.gov.hk/y r13-14/english/panels/tp/p apers/tp1115cb1-435-1-e.p df

Date of meeting	Panel/ Committee	Minutes/Paper	LC Paper No.
		Minutes of meeting	CB(1)669/13-14 http://www.legco.gov.hk/yr13-14/english/panels/tp/minutes/tp20131115.pdf
4.12.2013	ESC	Administration's paper	EC(2013-14)9 http://www.legco.gov.hk/yr13-14/english/fc/esc/papers/e13-09e.pdf
		Administration's follow-up paper	ESC22/13-14(01) http://www.legco.gov.hk/yr13-14/chinese/fc/esc/papers/esc1204esc-22-1-c.pdf
		Minutes of meeting	ESC24/13-14 http://www.legco.gov.hk/yr13-14/english/fc/esc/minutes/esc20131204.pdf
10.1.2014	FC	Recommendations of the Establishment Subcommittee made on 4 and 11 December 2013	FCR(2013-14)47 http://www.legco.gov.hk/yr13-14/english/fc/fc/papers/f13-47e.pdf
		Minutes of meeting	FC59/13-14 http://www.legco.gov.hk/yr13-14/english/fc/fc/minutes/fc20140110.pdf

Date of meeting	Panel/ Committee	Minutes/Paper	LC Paper No.
24.2.2017	TP	Administration's paper on proposals on technical legislative amendments on traffic arrangements for the Hong Kong-Zhuhai-Macao Bridge	CB(4)578/16-17(03) http://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20170224cb4-578-3-e.pdf
		Updated background brief on transport arrangements of the Hong Kong-Zhuhai-Macao Bridge prepared by the Legislative Council Secretariat	CB(4)578/16-17(04) http://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20170224cb4-578-4-e.pdf
		Information paper on the latest progress of the works of the Hong Kong-Zhuhai-Macao Bridge and the Hong Kong projects provided by the Administration	CB(4)584/16-17(01) http://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tpcb4-584-1-e.pdf
		Information paper on Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road reclamation works provided by Highways Department	CB(4)621/16-17(02) http://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20170224cb4-621-2-e.pdf

B. Relevant questions raised at Council meetings from 2014-2015 to 2016-2017 legislative sessions

Date of Council meeting	Question	Hyperlink
29.10.2014	Dr Hon KWOK Ka-ki raised a question on major infrastructure projects	http://www.info.gov.hk/gia/general/201410/29/P201410290463.htm
12.11.2014	Hon TANG Ka-piu raised a question on Hong Kong-Zhuhai-Macao Bridge local projects	http://www.info.gov.hk/gia/general/201411/12/P201411120641.htm
26.11.2014	Hon Kenneth LEUNG raised a question on construction costs of the Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities Project	http://www.info.gov.hk/gia/general/201411/26/P201411260341.htm
3.12.2014	Hon James TIEN raised a question on cost overrun of Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities project	http://www.info.gov.hk/gia/general/201412/03/P201412030457.htm
10.12.2014	Hon Frederick FUNG raised a question on operational arrangements of Hong Kong-Zhuhai-Macao Bridge	http://www.info.gov.hk/gia/general/201412/10/P201412100430.htm
28.1.2015	Hon WONG Kwok-hing raised a question on cross-boundary transport arrangements	http://www.info.gov.hk/gia/general/201501/28/P201501280314.htm
27.5.2015	Hon TANG Ka-piu raised a question on Hong Kong-Zhuhai-Macao Bridge project	http://www.info.gov.hk/gia/general/201505/27/P201505270408.htm
25.11.2015	Hon Steven HO raised a question on HZMB marine works	http://www.info.gov.hk/gia/general/201511/25/P201511250487.htm

2.12.2015	Hon Kenneth LEUNG raised a question on variations in the conditions of the environmental permit for the Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities Project	http://www.info.gov.hk/gi/a/general/201512/02/P201512020621.htm
16.12.2015	Hon James TIEN raised a question on impact of labour shortage in construction industry on progress of infrastructure projects	http://www.info.gov.hk/gi/a/general/201512/16/P201512160549.htm
25.5.2016	Hon Alice MAK raised a question on public transport services on Lantau Island	http://www.info.gov.hk/gi/a/general/201605/25/P201605240802.htm
23.11.2016	Hon Holden CHOW raised a question on transport infrastructure in Lantau	http://www.info.gov.hk/gi/a/general/201611/23/P2016112300486.htm
23.11.2016	Hon LEUNG Che-cheung raised a question on Tuen Mun-Chek Lap Kok Link and Tuen Mun Western Bypass	http://www.info.gov.hk/gi/a/general/201611/23/P2016112300495.htm
8.2.2017	Hon LEUNG Che-cheung raised a question on traffic situation in Northwest New Territories	http://www.info.gov.hk/gi/a/general/201702/08/P2017020800489.htm?fontSize=1
1.3.2017	Hon Paul TSE raised a question on cost estimates of infrastructure projects	http://www.info.gov.hk/gi/a/general/201703/01/P2017030100537.htm