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(Attn: Ms. Sharon CHUNG)

By E-mail and Fax
(E-mail: schung@legco.gov.hk)
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20 May 2016

Dear Ms CHUNG,

Public Works Subcommittee under the Finance Committee of the Legislative Council
Meeting on 18 May 2016
823TH – Tseung Kwan O – Lam Tin Tunnel
Supplementary Information

At the meeting held on 18 May 2016, Members of the Public Works Subcommittee (PWSC) under the Finance Committee of Legislative Council (LegCo) requested the Government to provide supplementary information on the above project. Our reply is as follows.

Reasons for Increase in Project Cost

2. The Civil Engineering and Development Department (CEDD) explained in detail the changes in the estimated cost of the Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) at the PWSC meeting on 18 May 2016, which are summarised as follows.

Table 1: Changes in the Estimated Cost of TKO-LTT

	(HKD)
Estimated construction cost based on the preliminary design in 2013 prices	$8.2 billion (Note: CEDD has indicated in the reports to the Sai Kung District Council in May 2014 and May 2015 that the estimate was under review.)
(Estimated construction cost of TKO-LTT after deducting the construction cost of Cha Kwo Ling tunnel)	$7.08 billion
Increase in construction prices between 2013 and 2015:	Construction cost increased by $2.17 billion
(A) Estimated construction cost based on the preliminary design (excluding Cha Kwo Ling tunnel) (2015 prices)	**$9.25 billion**
(B) Estimated construction cost based on detailed design (excluding Cha Kwo Ling tunnel) (2015 prices)	**$11.66 billion** (Note: This estimate is based on the detailed design and is in 2015 prices. The estimate in money-of-the-day prices is **$15.09 billion**. The LegCo Panel on Transport was consulted in March 2016 on the relevant funding application in accordance with the funding application procedures for public works projects.)
(B) – (A):	$2.41 billion

3. Similar to other major public works projects, the Government needed to carry out a series of preparatory work including site investigation, preliminary design, detailed design, etc. when planning the TKO-LTT. The preliminary design for the TKO-LTT commenced in 2009 and was completed in 2013.

4. The Government submitted a funding application to the LegCo for the detailed design of the project in 2013. As the accurate estimate for the construction of the project could only be determined upon the completion of the detailed design, the estimated construction cost was not stated in the relevant documents submitted to the LegCo at that time. The LegCo Finance Committee approved the funding application for the detailed design of the project in May 2013.

5. According to the preliminary design completed in 2013, the cost of the TKO-LTT (including the Cha Kwo Ling tunnel) was estimated to be $8.2 billion in September 2013 prices, which did not include the provision for price adjustment. In the reports to the Sai Kung District Council in May 2014 and May 2015, the CEDD already stated that the construction cost of $8.2 billion was under review because the detailed design of the project had not been completed.

6. In addition, as stated in the paragraph 5 of Paper No. PWSC(2016-17)14, the Cha Kwo Ling tunnel section, which is for connecting to Trunk Road T2, is not included in this funding application submitted to the LegCo for the construction of the main tunnel of the TKO – LTT. If the construction cost of the Cha Kwo Ling tunnel is deducted, the estimated project cost based on the preliminary design is $7.08 billion in September 2013 prices.

7. There was a significant increase in construction prices between 2013 and 2015. In 2015, the CEDD reviewed the market conditions and tender prices of similar infrastructure projects at that time, and estimated the cost of the project based on the preliminary design (excluding the Cha Kwo Ling tunnel) to be $9.25 billion in September 2015 prices.

8. The detailed design has now been completed. According to the detailed design, the estimated construction cost of the main tunnel of the TKO-LTT is $11.66 billion in September 2015 prices ($15.09 billion in money-of-the-day prices).

There is a difference of $2.41 billion compared with the estimate based on the preliminary design. This is mainly due to (i) additional design facilities (including the bus-bus interchange and footbridge system), (ii) changes resulting from enhanced design standard and (iii) additional expenditure incurred from changes in design brought about by the latest site investigation results. Please refer to the table below for details.

Table 2: Additional Cost Incurred from Modifications of Detailed Design

		(HK$) (billion)	(HK$) (billion)
i.	**Additional design facilities or modifications**		**0.531**
●	Bus-bus interchange and associated facilities (including the associated footbridges, covered walkways, toilets, changes in the design of landscaped deck and associated site formation works)	0.417	
●	Semi-cavern design adopted for the East Ventilation Building to reduce environmental and visual impacts	0.114	
ii.	**Changes resulting from enhanced design standards**		**0.526**
●	Polypropylene fibres added to the tunnel lining to reduce spalling and damage of concrete at high temperature; and thermal barriers installed at suitable locations of the tunnels for better protection to the structure of the tunnels during fire	0.033	
●	Modification of the design of bridges, ventilation buildings and tunnel lining of a total length of about 5800m to meet the latest standards of the Structures Design Manual for Highways and Railways issued by the Highways Department (e.g. enhancing the design requirements of tunnel materials and concrete, enhancing earthquake resistance, etc.)	0.493	

		(HK$) (billion)	(HK$) (billion)
iii.	**Design modification to cater for the latest site investigation results**		**1.353**
●	Modification of the alignments of some elevated slip roads in Lam Tin, resulting in enlargement of the extent of site formation works	0.932	
●	The marine mud at some locations is about 3m to 6m thicker than anticipated in the preliminary design, resulting in more excavation and filling works for the seawall foundation	0.057	
●	Construction of a cofferdam of about 1000m long to minimise impacts to the environment in view of the increased volume of marine mud to be excavated, and to prevent loss of muddy water during excavation of marine mud	0.171	
●	Addition of 450 piles for Road P2 to resist negative skin friction in view of the increased thickness of marine mud	0.193	
		Total of i+ii+iii	**$2.41billion**

9. The CEDD will implement suitable cost control measures, including packaging the project into several contracts for implementation, so as to enhance tender competitiveness, and adopting standard designs and precast units wherever practicable.

10. Direct comparison of construction costs of different tunnels is not feasible because of the differences in construction methods, geological conditions, geographical constrains, and traffic and environmental mitigation requirements. Regarding the tunnel construction works of the TKO-LTT, the tunnel is required to pass through several fault zones. In addition, its alignment is close to residential estates and a number of important facilities, including the rehabilitated Sai Tso Wan Landfill, Kwun Tong Line and Tseung Kwan O Line of MTRCL, and the Junk Bay Chinese Permanent Cemetery. Apart from avoiding the impact on these residential

estates and important facilities, we have to overcome their constraints on the works. As a result, some sections of the tunnel will have to be constructed by the more expensive non-blasting method.

Consulting the Fisheries Industry on the Reclamation Works of the Project

11. In 2013, the CEDD completed the Environmental Impact Assessment (EIA) Report of the TKO–LTT Project, covering the impact on the fisheries industry. In April 2013, the CEDD exhibited the report for public inspection and in May 2013 consulted the EIA Subcommittee of the Advisory Council on the Environment. The Environmental Protection Department approved on 11 July 2013 the EIA Report of the Project with conditions under the EIA Ordinance (please see footnote 7 of PWSC(2016-17)14 for the conditions) and issued the Environmental Permit for the construction and operation of the project on 15 August 2013. In response to Members' suggestion, the CEDD will arrange for consulting and briefing the fisheries industry as soon as possible.

Traffic Condition of Traffic Interchanges Adjacent to the Project

12. As requested by Members, we provide below the reserve capacity and volume/capacity (v/c) ratio of major junctions and roads adjacent to TKO–LTT during peak hours in 2014, 2021 (the expected year of commissioning of the TKO–LTT), 2026 and 2031 for Members' reference. The locations of these junctions and roads are shown at **Annex**.

Table 4: Traffic Conditions of Major Junctions and Roads adjacent to TKO–LTT during Peak Hours

Major Junctions & Roads		Reserve Capacity (Note 1) or Volume/Capacity (v/c) ratio (Note 2) during Peak Hours					Remarks
			2014	2021	2026	2031	
(a) Wai Fat Road/ Wai Yip Street	**Signalised Junction**	**am**	16%	13%	10%	9%	The proposed improvement works include adjustment to the mode of control of the signalised junction to lengthen the time of green-light of various traffic directions. The reserve capacities in 2021, 2026 and 2031 are the traffic conditions after implementation of the junction improvement works.
		pm	-4%	17%	13%	11%	
(b) Cha Kwo Ling Road/ Wai Yip Street	**Signalised Junction**	**am**	24%	22%	19%	16%	The proposed improvement works mainly include provision of additional traffic lanes, adjustment to the mode of control of the signalised junctions, relocation of pedestrian crossings, etc. The reserve capacities in 2021, 2026 and 2031 are the traffic conditions after implementation of the relevant improvement works.
		pm	86%	43%	39%	36%	
(c) Lei Yue Mun Road/ Link Road to Eastern Harbour Crossing (EHC)	**Signalised Junction**	**am**	18%	5%	5%	4%	
		pm	77%	57%	54%	52%	

Major Junctions & Roads		Reserve Capacity (Note 1) or Volume/Capacity (v/c) ratio (Note 2) during Peak Hours					Remarks
			2014	2021	2026	2031	
(d) Kwun Tong Road/Hip Wo Street	**Round-about**	**am**	0.9	The commissioning of TKO–LTT will not attract additional traffic to the Kwun Tong Road/Hip Wo Street junction. Therefore, no improvement measure related to this junction is recommended under the TKO-LTT project. Nevertheless, the Urban Renewal Authority is studying the improvement works of Kwun Tong Road/Hip Wo Street junction to ease the present traffic congestion of the junction during peak hours.			
		pm	0.9				
(e) Lei Yue Mun Road (towards EHC)	**Road**	**am**	0.7	0.7	0.7	0.7	–
		pm	0.6	0.7	0.7	0.7	
(f) Lei Yue Mun Road (towards Kwun Tong)	**Road**	**am**	0.8	0.8	0.8	0.8	–
		pm	0.9	0.7	0.8	0.8	
(g) Cha Kwo Ling Road (towards Kwun Tong)	**Road**	**am**	0.3	0.3	0.3	0.3	–
		pm	0.2	0.2	0.3	0.3	
(h) Cha Kwo Ling Road (towards Yau Tong)	**Road**	**am**	0.2	0.2	0.2	0.2	–
		pm	0.2	0.3	0.3	0.3	

Note 1： The traffic condition of a signalised junction is indicated by its RC. A positive RC indicates that the junction is operating with spare capacity. A negative RC indicates that the junction is overloaded, resulting in traffic queues and delay.

Note 2: V/c ratio is an indication of the traffic conditions of roads. A v/c ratio equals to or less than 1.0 is considered acceptable. A v/c ratio between 1.0 and 1.2 indicates a manageable degree of congestion. A v/c ratio above 1.2 indicates more serious congestion. The traffic conditions of roundabouts are indicated by their v/c ratios. A v/c ratio equals to or less than 1.0 is considered acceptable.

13. The Government will continue to monitor the traffic conditions at the concerned junctions and roads and will consider implementing improvement measures timely.

Your sincerely,

(Jessica LEE)
for Secretary for Transport and Housing

c.c.

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Major Junctions and Roads adjacent to Tseung Kwan O – Lam Tin Tunnel

Annex