

**Legislative Council Finance Committee**

**Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong  
Express Rail Link**

**Follow-up action arising from the discussion of application for  
additional funding for the construction of the Hong Kong Section of  
the Guangzhou-Shenzhen-Hong Kong  
Express Rail Link at the Meeting on 20 February 2016**

**INTRODUCTION**

At the Meeting of the Finance Committee (“FC”) meeting on 20 February 2016, Members continued to discuss matters relating to the application for additional funding for the construction of the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (“XRL”) project. This paper aims to respond to Members’ enquiries raised at the meeting.

**ESTIMATED PROJECT COST OF THE XRL**

2. The MTR Corporation Limited (“MTRCL”) announced in August 2014 that the interim revised Cost to Complete (“CTC”) for the XRL was \$71.52 billion. This estimate was based on the available information at that time and commissioning of the XRL in end-2017. Based on the information provided by MTRCL then and with the assistance of the Monitoring and Verification (“M&V”) Consultant, the Highways Department (“HyD”) completed the assessment of MTRCL’s CTC. Based upon this assessment<sup>1</sup>, HyD and its M&V Consultant considered that **MTRCL’s CTC tended to be on the low side** for budgeting purpose. HyD also noted that **the second report of MTRCL’s Independent Board Committee (“IBC”) came to a similar conclusion** (see paragraph 2.31 of the report). In November 2014, **HyD urged MTRCL to review again the CTC in view of the IBC report and HyD’s review**

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<sup>1</sup> HyD and its M&V Consultant, in their assessment, identified certain items which had not been included in the CTC which would need to be reviewed to ensure adequate coverage in the risk allowances.

**findings, and to advise how the identified items which had not been included in the CTC would be addressed and allowed for.** MTRCL undertook to review further.

3. On 30 June 2015, the MTRCL submitted to the Government of its latest review results regarding the revised Programme to Complete and revised CTC. The commissioning target of the XRL would have to be delayed further to the third quarter of 2018, which includes a six-month contingency period. As regards the CTC, the amount would be substantially adjusted upward and further revised to \$85.3 billion, including a sum of \$2.1 billion for contingency. The reasons for the revision of CTC by the MTRCL have been detailed in the paper no. CB(4)1228/14-15(01) submitted by the MTRCL to the Subcommittee on Matters Relating to Railways (“RSC”) under the Panel on Transport of the Legislative Council (“LegCo”). Comparing the revised CTC of \$71.52 billion submitted in July 2014, the MTRCL expressed that the major difference are mainly due to the four set of reasons below:

- (a) Further Programme Extension: the extended duration (from end 2017 to the third quarter of 2018) of the construction programme brings higher associated costs such as labour, project management, site running costs and insurance and has also resulted in the need to instruct delay recovery and programme protection measures to ensure that the work progress matches with work schedule. In addition, the extended programme has resulted in the need to re-sequence related construction works, which also leads to higher costs;
- (b) Additional Project Costs: there are continuous and significant increases in underlying costs, particularly labour and material costs, since construction began. After further review, with more detailed data being available to allow for better analysis and assessment, the MTRCL has enhanced visibility and a fuller understanding of the higher underlying costs;
- (c) Changes/Unaccounted Items: after further review, the MTRCL also includes in the revised CTC estimate some costs that were unaccounted for during the previous 2014 interim update, and

also additional costs incurred in relation to changes in scope or methodologies of work, such as the station facilities, decoration and operation equipment of the West Kowloon Terminus (“WKT”) as well as the underfloor wheel lathe facilities at Shek Kong Stabling Sidings; and

- (d) Contingency: after further view, the MTRCL also increases contingency amount to provide additional cost certainty and give consideration to cost induced from potential risk.

4. As stated in the paper no. CB(4)280/15-16(02) submitted to the RSC in November 2014, the review by the HyD and its M&V Consultant found that the revised CTC had some room for reduction. **After considerable discussion, the Government and the MTRCL reached an agreement. The MTRCL accepted the Government’s request to put a “cap” on the Entrustment Cost at HK\$84.42 billion.** Details of assessment by HyD and its M&V Consultant are included in the paper submitted to the RSC on 30 June 2015 (paper no. CB(4)280/15-16(02)). The relevant part is at **Annex 1** for Members’ reference. Together with the additional government costs for delay of works (\$2 billion in total), the approved project estimate for the XRL project is proposed to be increased to \$86.42 billion.

#### **“MAIN CONTROL SYSTEM” OF THE XRL**

5. **The XRL “Main Control System” is neither part of the signaling system nor a safety critical system.** The “Main Control System” is an integrated monitoring system for receiving and integration of data of various electrical and mechanical (“E&M”) systems, such as building services equipment, electricity supply, tunnel ventilation, communication, signalling, etc. It will facilitate the operational personnel to have an overall view of the facilities and train operation status at the WKT and tunnels for better operation efficiency. The “Main Control System” can receive and disseminate information, but **it will not send out train operation signal; hence it does not involve safety of the signalling system.**

6. MTRCL undertook an open international tendering process for the procurement of the XRL “Main Control System”. MTRCL had stipulated the technical requirements in the tender document based on the XRL “Main Control System” operation requirements. During the tender evaluation process, MTRCL examined whether the valid tenders were in compliance with the technical requirements stipulated in the tender document. In addition, MTRCL had assessed whether the tenderers possessed the relevant project experience. The location of the projects undertaken by the tenderers was not stipulated. According to the information provided by the MTRCL, during the international open tender process, there were a total of four overseas and Mainland tenderers for the XRL “Main Control System”. Upon completing the relevant established procedures, the MTRCL awarded the XRL “Main Control System” contract to the successful tenderer, Beijing HollySys Co., Ltd.

7. The Government and the MTRCL entered into an Entrustment Agreement in January 2010 for entrusting the construction, testing and trial operation of the XRL. According to the Entrustment Agreement, MTRCL would manage the XRL project in accordance with their management system and procedures, including procurement of the XRL contracts according to their relevant procedures which cover tender invitation, tender assessment, detailed technical assessment and financial assessment. The procurement procedures also have to comply with requirements of the Agreement of Government Procurement of the World Trade Organization. **While the HyD monitors the procurement procedures for compliance of the relevant requirements, HyD does not participate in the tender assessment.**

8. During a meeting between HyD and MTRCL on the XRL signalling system and rolling stock on 17 August 2011, HyD **suggested** that the MTRCL engage an external consultant to provide input in the tender assessment of the relevant systems, in order to strengthen the technical assessment on the signalling systems. On 10 October 2011, the MTRCL appointed Systra Company, a subsidiary of the French National Railway Company (SNCF), as a third party independent consultant to assess the tenders for compliance to the technical requirements. SYSTRA Company is an international engineering group based in France and specialised in railway and public transport.

9. The MTRCL awarded three XRL contracts to the Beijing HollySys Co., Ltd. These contracts included “Main Control System” (Contract No. 853) awarded on 8 November 2011 and “Signalling System – Trackside Equipment” (Contract No. 841A) and “Signalling System – Trainborne Equipment” (Contract No. 841B), both awarded on 7 March 2012.

10. After completing the XRL project, the MTRCL will conduct a series of tests including factory acceptance tests, integrated systems tests and on site acceptance tests to ensure that all systems are in compliance with the system requirements before putting them into service. The Railways Branch of the Electrical and Mechanical Services Department will also monitor the on-site safety related tests to ensure that the MTRCL had taken appropriate safety measures on the XRL to ensure safe and normal operation, prior to granting approval for the XRL to enter passenger service.

## **USE OF THE XRL**

11. As clearly explained by the Secretary for Transport and Housing at the Public Works Subcommittee (“PWSC”) and FC meetings, the planning, design and set-up of the Hong Kong Section of the XRL is completely for civil use, so that passengers is provided with a convenient cross-boundary transport services. Any allegation about constructing the XRL for military purpose is groundless.

## **INCREASE IN XRL CONTRACT PRICES**

12. The increase in the cost of XRL project implemented by the MTRCL is mainly attributed to the following reasons –

- (a) unfavourable ground condition,
- (b) disruption due to other causes,
- (c) changes in design to suit actual site conditions and various unforeseen circumstances,
- (d) price escalations,

- (e) additional project management cost and insurance, and
- (f) contingency for the remaining works.

Details can be found in our papers, no. PWSC(2015-16)50 – Hong Kong Section of XRL – construction of railway works and PWSC(2015-16)51 – Hong Kong Section of XRL – construction of non-railway works, submitted to the PWSC in December 2015. Also, the MTRCL’s paper submitted to the RSC in December 2015 (no. CB(4)280/15-16(03)) also explained the reasons.

13. According to the information provided by the MTRCL, the latest cost estimate for the 42 major contracts are higher than the awarded contract sum. The breakdown of the percentage increase in contract sum (i.e. the latest cost estimate of the contracts minus their awarded contract sum, divided by the awarded contract sum) is provided below –

<b>Estimated Percentage Increase in Contract Sum</b>	<b>No. of Contract</b>
below 25%	11
26% - 50%	11
51% - 75%	11
76% - 100%	5
over 100%	4
<b>Total</b>	<b>42</b>

14. As regards to the claims submitted for individual contracts and the estimated amount to be awarded, since discussions between the MTRCL with the individual contractors are underway, disclosure of the amount allocated for each contract would adversely affect the negotiation power of the MTRCL during the discussion with contractors and might even affect the negotiation between contractors and their subcontractors. The progress of construction works to be carried out by contractors might also be affected. Hence, disclosing such information is not in the interest of the XRL project, the Government and the public. To safeguard the interest of the public money, it is not appropriate for us to disclose the

estimated amount allocated to individual contracts at this stage.

15. The MTRCL has an established mechanism for processing claims submitted by contractors. The contractors must also provide sufficient justifications and information. This mechanism has been used for years and is considered effective. All claims assessments have to be approved by the MTRCL's internal Project Control Group ("PCG"). The relevant papers will be submitted to HyD and its M&V Consultant for review before the PCG meetings. HyD and M&V Consultant will provide comments on the papers and the justifications of the suggested claims for approval, so that the MTRCL may follow up and consider at the PCG meetings. According to the Entrustment Agreement signed between the Government and the MTRCL, as the project manager, the MTRCL must act in accordance with its internal management system and procedures to manage the XRL project in the best interest of the project, including processing and approval claims.

## **OPERATING ARRANGMENTS OF THE XRL**

16. Regarding follow-up items 5, 6 and 8 raised by the Members, including procurement of rolling stock by the Hong Kong side and operating details, maintenance arrangement of XRL train in the Mainland, and the methodology of estimation and depreciation year, and the expenditures on interest, tax and capital depreciation in 2018, 2021, and 2031, please refer to the paper on XRL operating arrangements at [Annex 2](#).

## **XRL WORKERS**

17. As at the end of December 2015, a daily average of about 7,712 construction workers and technical/professional staff members were employed by XRL contractors, which included 5,855 frontline construction workers. Among them, over 85% were civil workers, and the rest were E&M workers.

18. The MTRCL has been proactively engaging with the Government

and construction industries, and has organised a number of meetings and seminars to address the labour shortage; and to brainstorm appropriate measures to assist the industries for recruiting labours and to promote sustainability for the industries. In response to the labour shortage for the XRL project, the MTRCL had co-ordinated with contractors to resolve the situation by re-sequencing works through arranging works to be carried out in parallel. At the same time, contractors were exploring recruiting labours through the “First-Hire-Then-Train” Scheme and “Supplementary Labour Scheme” (“SLS”).

19. Since the commencement of XRL works in 2010 till December 2015, there were 449 imported workers (among which 196 had been approved for extension) approved through the “SLS”, with most of them (73%) involving in tunnelling for the Hong Kong section of cross boundary tunnelling works under Contract no. 826 – cross boundary tunnel.

20. As the civil works of the XRL is approaching completion, frontline workers for related civil works will be released. In parallel, as the project is reaching the peak for E&M works, a higher demand for skilled labours is expected for E&M contractors, mainly on E&M installation including air-conditioning equipment, track laying, as well as installation of escalators and elevators.

21. According to information from contractors and the current works programme, the MTRCL estimates the number of workers required for the XRL project in future by year as follows -

<b>Contract</b>	<b>Estimated no. of workers required (Average Man-Month)</b>		
	<b><u>2016</u></b>	<b><u>2017</u></b>	<b><u>2018</u></b>
Civil Contracts	4,100	1,500	600*
E&M Contracts	2,100	1,600	200*

\* Remark: Figures are the estimated number of workers required as of Q1 2018



22. Through the “SLS” for employment of labour, the XRL contractors currently employ about 250 imported labour in total. As for the “SLS” applications awaiting approval, it involves 200 imported workers, including track layer (50 workers), general welder (8 workers), refrigeration/air-conditioning/ventilation mechanic (92 workers), and lift and escalator mechanic (50 workers).

23. The MTRCL provides the actual numbers of labours employed in the quarterly report on the progress and financial situation of the construction of the XRL submitted to the RSC under the Panel on Transport of the LegCo.

**Transport and Housing Bureau  
Highways Department  
February 2016**

## **Review of Revised Cost to Complete for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link**

### **Introduction**

This Annex sets out the findings of the review of the MTR Corporation Limited's ("MTRCL") revised Cost to Complete ("CTC") for the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link ("XRL") announced on 30 June 2015.

### **Revised Cost to Complete**

2. The revised CTC submitted by the MTRCL on 30 June 2015 is \$85.3 billion, including a sum of \$2.1 billion for contingency.

3. As confirmed by MTRCL, it has adopted a **bottom-up approach** in deriving the revised CTC. The Highways Department ("HyD") and its monitoring and verification ("M&V") consultant has checked the principles and methodology of the cost items based on the bottom-up information provided by MTRCL, including allowances for submitted and future claims, remaining risks and anticipated variations as well as the contingency allowance, in particular about how the \$2.1 billion contingency is derived. For example, the validity and principles of submitted claims were reviewed. Methodologies of estimating the allowances for prolongation costs under different contracts and resultant estimates were also checked. Regarding the proposed additional project management cost ("PMC") of MTRCL, the detailed staff structures of different project teams, the associated cost and anticipated expenditure over the coming years are checked.

### **HyD's and the M&V Consultant's Initial Assessment**

4. The M&V Consultant noted that the cost build-ups of revised CTC basically follow the same principles and methodology adopted in the previous

CTC submitted by MTRCL in July 2014. However, the M&V Consultant identified several cost items for which the allowances were considered excessive with room for reduction as follows :

(a) Time-related cost for one quarter

The review finds that build-ups of the revised CTC are based on a target programme for XRL opening in the fourth quarter of 2018 instead of the third quarter of 2018, and all time-related costs, e.g. prolongation, civil attendance and extended defect liability periods, are allowed to meet this target. To tally with the revised PTC for opening in the third quarter of 2018, time-related costs of about **\$0.338 billion** for one quarter period should be deducted.

(b) Tender risk allowance

There is an allowance for **\$0.08 billion** for tender risk allowance, as part of the contingency of \$2.1 billion. Since tender risk allowance is entirely attributed to the Contractor's tender strategy, the associated cost should not be borne by the Employer.

(c) Additional insurance

Due to adjustment of the project outturn costs, the additional insurance, as part of the contingency of \$2.1 billion, shall be downward adjusted by about **\$0.031 billion** accordingly.

(d) Additional PMC

The top-down review finds that the percentage cost increase under many heads of additional PMC are much higher than the percentage time extension from the original Entrustment Programme to the revised PTC. Since the work nature and establishment of these working teams

should not have been significantly affected by the delayed programme, the excessive cost increase is considered not reasonable. A total reduction of about **\$0.728 billion** is proposed on a pro-rata basis.

A summary table showing the above proposed cost reduction items is as follows:

	<b>Description</b>	<b>Reduction amount (\$ billion)</b>
1.	Time-related cost for one quarter	-0.338
2.	Tender risk allowance	-0.08
3.	Additional insurance	-0.031
4.	Additional PMC	-0.728
	<b>Total:</b>	<b>-1.177</b>

5. On the other hand, the review exercise identified the following missing items which should be covered in the budget –

(a) Finance charge

Finance charge for individual contracts may be taken as valid claims and hence should be allowed with reference to the methodology adopted by MTRCL. The estimated allowance for finance charge is about **\$0.007 billion**.

(b) Extension of Excavation Permit

Based on the latest assessment of charge for extension of Excavation Permit for WKT contracts, an additional allowance of **\$0.06 billion** should be considered.

(c) Booking adjustment in the estimate

It is noted that some of the estimated amounts have not been properly booked. This amount of **\$0.379 billion** should be added back to the estimated cost.

(d) Price escalation for Day 2 platform works<sup>1</sup>

The price escalation for the Day 2 platform works has not been included in the MTRCL's assessment. For budgeting purpose, it is estimated that an additional sum of **\$0.5 billion** would be allowed in this regard.

A summary table showing the above proposed cost addition items is as follows:

	<b>Description</b>	<b>Additional amount (\$ billion)</b>
1.	Finance charge	0.007
2.	Extension of Excavation Permit	0.06

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<sup>1</sup> The West Kowloon Terminus (“WKT”) is designed with nine tracks for long haul and six tracks for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks will be required when the XRL begins commissioning in 2018. Depending on the growth in patronage, the remaining five tracks (“Day 2 Works”) may be required at a later stage. After careful deliberation, we have decided to defer the completion of the Day 2 Works, subject to the growth in patronage after commissioning of the XRL in 2018. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years.

3.	Booking adjustment in the estimate	0.379
4.	Allowance for price escalation for Day 2 platform works	0.5
	Total:	0.946

6. As a result, the M&V Consultant assessed that the net reduction would be **\$0.231 billion** (i.e. -\$1.177 billion + \$0.946 billion).

7. Separately, the West Kowloon Terminus (“WKT”) is designed with nine tracks for long haul and six for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks will be required when the XRL begins commissioning in 2018. Depending on patronage growth, the remaining five tracks (“Day 2 Works”) may be opened at a later stage. After careful deliberation, the Government affirmed the deferral of the completion of the Day 2 Works to a future date to be reviewed subject to patronage growth after commissioning of the XRL. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years. The cost of the Day 2 Works, amounting to **\$0.544 billion**, will be taken out from the current Entrustment Cost of \$65 billion. A sum of **\$0.036 billion** will also be deducted from the PMC under the Entrustment Agreement (“EA”) as the MTRCL is no longer required to complete the Day 2 Works at this moment. Further, the price escalation for the Day 2 platform works (i.e. **\$0.5 billion**) as initially assessed by the M&V Consultant (paragraph 5(d) above) can be correspondingly excluded. In sum, the project cost will be reduced by **\$1.08 billion**.

8. Having regard to the initial assessment set out in paragraphs 4 to 7 above, HyD and the M&V Consultant considered that the revised CTC could be reduced from \$85.3 billion to **\$83.989 billion** (i.e. \$85.3 billion - \$0.231 billion

- \$1.08 billion).

### **Discussion with MTRCL on Revised CTC Review**

9. Upon completion of the initial assessment, the Government had several rounds of exchange with MTRCL on HyD's and M&V Consultant's initial review result. Based on further information provided by MTRCL, HyD (with the advice of the M&V Consultant) agreed to adjust the revised CTC as follows –

#### ***Reduction Items***

10. For the **potential reduction items**, MTRCL agreed with the reduction amounts of the following items –

- (a) Time-related cost for one quarter

MTRCL agreed to deduct the time-related costs to tally with the revised PTC for opening in the third quarter of 2018 as set in out paragraph 4(a). This amounts to **\$0.338 billion**.

- (b) Additional PMC

The top-down review found that the percentage cost increase under many heads of additional PMC were higher than the percentage time extension from the original programme to the revised PTC (54.4% time extension of original programme vs revised programme). Since the work nature and establishment of these working teams should not have been significantly affected by the delayed programme, MTRCL was requested to explain the higher cost increases. By applying a simple across-the-board formula of 54.4%, the additional PMC might be reduced by as much as \$0.728 billion as explained in paragraph 4(d). In response to HyD's queries, the Corporation provided further

information to explain that the number of staff in many of their site supervision and contract management teams will have to be increased to enhance the project management. Further resources will have to be deployed for programming, claims assessment, interface management, stakeholder engagement and enhanced reporting, etc. in response to the recommendations made by their Independent Board Committee and the Government-appointed Independent Expert Panel. Following discussion with the Government, the Corporation agreed to reduce the additional PMC by **\$0.15 billion**.

(c) Contingency

MTRCL agreed with the reduction of tender risk allowance and additional insurance from the contingency as set out in paragraphs 4(b) and (c). The related amount for these two items is **\$0.111 billion**.

MTRCL advised that the contingency comprised further allowance for submitted claims as well as a general contingency. MTRCL clarified that inclusion of a general contingency was considered to be prudent, especially given the uncertainties associated with the current market with very high levels of cost escalation. HyD considered that such inclusion by MTRCL of a general contingency for future unknown claims was not unreasonable. Having said that, given that over 70% of the project has already been completed the estimated project cost should have a greater degree of certainty and the need for a huge sum of contingency might not be necessary. Following discussion with the Government, the Corporation agreed to further reduce the contingency by **\$0.147 billion**. The total under Contingency is reduced by **\$0.258 billion** to \$1.842 billion.

*Additional Items*



11. After discussion, MTRCL agreed with the proposed additional amounts set out in paragraphs 5 (a) to (c) above. The total sum to be added should be **\$0.446 billion**.

## Overall

12. Overall, following the careful review by the Government and discussion between the two parties, both sides have agreed that the net adjustment to the revised CTC is **\$0.3 billion**. As a result, it is considered reasonable to downward adjust the revised CTC from \$85.3 billion to \$85.0 billion.

13. After taking out the allowance for the cost of the Day 2 Works (**\$0.544 billion**) and PMC required to complete the Day 2 Works (**\$0.036 billion**) as mentioned in paragraph 7 above, the total cost-saving is **\$0.58 billion**. As a result, the revised CTC can be further reduced to **\$84.42 billion**. A summary table showing the reduction in revised CTC is as follows:

<b>(1) Revised CTC Submitted by MTRCL to Government on 30 June 2015</b>		<b>\$85.3 billion</b>
(2)(a) Net Adjustment		
(i) Reduction of contingency	- \$0.258 billion	
(ii) Reduction of time-related costs for one quarter	- \$0.338 billion	
(iii) Missing items or items which warrant additional allowance in revised CTC	+ \$0.446 billion	
<b>2 (a) [(i) + (ii) + (iii)]</b>		<b>- \$0.15 billion</b>

2 (b) Reduction of additional PMC		- \$0.15 billion
(3) Cost Saving for Day 2 Works		
(i) Cost saving for taking out Day 2 Works	- \$0.544 billion	
(ii) Cost saving of PMC for Day 2 Works	- \$0.036 billion	
(3) [(i) + (ii)]		- \$0.58 billion
(4) Total Reduced Amount [2(a) + 2(b) + 3]		- \$0.88 billion
<b>Revised CTC [(1) - (4)]</b>		<b>\$84.42 billion</b>

14. It should be noted that the revised CTC review exercise focused only on the estimate of the cost required to complete the project taking into account, amongst other things, allowance for future project risks and possible claims. The provision of allowance for further project risks and possible claims is considered a sensible budgetary approach. However, if and when any claims are made by Third Party contractors for additional time and/or cost, MTRCL shall, as a competent project manager, critically assess such claims, and **under the EA the onus is on MTRCL to ensure that contractors are granted claims no more than they are contractually entitled to.** Any assessment of any liabilities of MTRCL and its agents to the Government associated with delivery of the XRL project under the XRL EAs has not formed part of this review.

**Highways Department**

**November 2015**

## Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link Operating Arrangements

### Introduction

This Annex provides supplementary information on the operating arrangements being planned as of today of the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (“XRL”).

### Background

2. The patronage of the XRL can be broken down into two parts: long haul services (from West Kowloon to cities beyond Guangzhou); and short haul services (from West Kowloon to Shenzhen (including Shenzhen North and Futian)/Humen/Guangzhou)<sup>1</sup>. The patronage forecast and economic benefit of the XRL<sup>2</sup> are listed in **Table 1**–

**Table 1 - Patronage forecast and economic benefit of the XRL**

<b>Forecast Daily Patronage in 2018</b> <sup>Note</sup> <b>(Two-way)</b>	<b>109,200</b>
West Kowloon – Shenzhen(including Shenzhen North and Futian )/Humen/Guangzhou	90,600
West Kowloon – beyond Guangzhou	18,600
<b>Estimated Operational Margin in 2018</b> <sup>Note</sup>	42%
<b>Estimated Average time saving over 50 years of operation per annum</b>	39 million hours
<b>Estimated discounted economic benefits over 50 years (discounted to 2015 prices at a rate of 4%) (mainly in terms of time savings to passengers)</b>	\$90 billion
<b>Economic Internal Rate of Return (EIRR) in real terms</b>	4%

Note: Assuming commissioning in the third quarter of 2018, the estimate only covers the fourth quarter of 2018.

<sup>1</sup> Including interchange passengers at Shenzhen/Humen/Guangzhou, with destination in cities beyond Guangzhou.

<sup>2</sup> Updated in 2015.

### **Service Concession Arrangement**

3. In April 2008, the Chief Executive-in-Council decided to take forward the construction of the XRL according to the current alignment scheme. It was also decided that the MTR Corporation Limited (“MTRCL”) should be requested to proceed with the further planning and design of the XRL on the understanding that it would be invited to undertake the operation of the XRL under the concession approach. The Public Works Subcommittee (“PWSC”) under the Finance Committee (“FC”) of the Legislative Council (“LegCo”) supported the funding application for the design and site investigation of the XRL project in June 2008. The funding application was subsequently supported by the FC in July 2008. On 24 November 2008, the Government and MTRCL entered into an *Entrustment Agreement for Design and Site Investigation in relation to the Express Rail Link*. The Chief Executive-in-Council further decided in October 2009 that the MTRCL should be requested to proceed with the construction, testing and commissioning of the XRL on the understanding that it would be invited to undertake the operation under the concession approach. The Government will timely discuss with the MTRCL the detailed arrangement of service concession.

### **Train Frequency**

4. The XRL is one of the priority railways recommended for implementation in the “Railway Development Strategy 2000”. It is also one of the Ten Major Infrastructure Projects announced in the “2007-08 Policy Address”. Upon completion, it will provide express rail service between Hong Kong and Guangzhou, with intermediate stations at Futian, Shenzhen North and Humen, and provide long haul train services to other Mainland cities. Through the stations in the Mainland section, XRL passengers can interchange with the wider urban metro, regional and national railway lines in the Mainland. Thus, the XRL will greatly enhance Hong Kong’s connectivity with various parts of the Mainland and is of great strategic importance to Hong Kong.

5. According to the plan in 2009, in the initial years upon the commissioning of

the XRL, there will be 90 and 24 daily train pairs for short haul services to the Shenzhen and Guangzhou areas respectively. These translate into an average 15-minute headway to Shenzhen (Shenzhen North) and 30-minute headway to Guangzhou for most hours. Subject to the development of the national railway schedules, there will be 24 daily train pairs to 15 Mainland cities in initial years, which will gradually increase to 33 daily pairs to 16 cities (including Shanghai, Beijing, Xiamen, Hangzhou, Shantou, Wuhan, Fuzhou, Nanning, Changsha, Kunming, Chongqing, Chengdu, Xi'an, Nanchang, Nanjing, and Zhengzhou) around 2031.

6. The XRL will connect to the national high-speed rail network. A project jointly built and operated by the Mainland and Hong Kong, it will provide high-speed rail service between Hong Kong and Guangzhou. The Mainland is responsible for the construction of 116 kilometres (“km”) of railway and relevant stations. Works of the Hong Kong Section, including 26 km of railway and the West Kowloon Terminus (“WKT”), have been entrusted by the Hong Kong Special Administrative Region Government to the MTRCL. Both the Mainland and Hong Kong have all along been planning the services of the XRL with a total of four short-haul stations on the Guangzhou-Shenzhen Section i.e. Futian, Longhua (now Shenzhen North), Humen in Dongguan and Shibi in Guangzhou (now Guangzhou South)<sup>3</sup>. The travelling time between Hong Kong and Guangzhou by trains will be reduced significantly from about 100 minutes to 48 minutes. This is formulated based on direct train from WKT in Hong Kong to Guangzhou South Station with no intermediate stop. The Hong Kong side has been designing the project based on this scheme and discussing the operations details with the Mainland authorities and operators.

### **Operational Effectiveness**

7. As regards the operational effectiveness of the XRL, as in the supplementary information paper (paper no. FC122/15-16(1)) submitted to the FC on 19 February this year, we estimate the fare revenue of the XRL based on the latest

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<sup>3</sup> Between Futian and Guangzhou South Stations, apart from Shenzhen North and Human, there are also Qingshen and Guangmingcheng Stations in the Mainland section. Their existence on the Guangzhou-Shenzhen Section does not mean that XRL trains to and from Hong Kong in the future have to stop at these two stations. In fact a rail line can have many train stations and trains need not stop at each and every station.

patronage forecast and assumed fares. The patronage forecast and fare assumptions are respectively listed in **Table 2** and **Table 3**. For the purpose of revenue forecast for the XRL, we assume a similar mileage-based mechanism used in the existing Through Train service for trips to Dongguan and Guangzhou. We have also made reference to the revenue contribution from the Hunghom-Lo Wu service for trips to Shenzhen.

**Table 2 – Patronage forecast in 2015**

	Base case in 2009			Updated forecast in 2015		
	2016	2021	2031	2018 <sup>Note</sup>	2021	2031
<b>Short-haul</b>	84,000	100,800	134,700	90,600	98,200	119,800
<i>Shenzhen</i> <i>(Shenzhen North and Futian)</i>	65,400	75,500	102,100	67,500	74,000	93,400
<i>Humen</i>	5,900	7,400	8,900	4,800	4,800	5,800
<i>Guangzhou South</i>	12,700	17,900	23,700	18,300	19,400	20,600
<b>Long-haul</b>	15,000	18,900	25,300	18,600	21,000	30,000
<b>Total</b>	<b>99,000</b>	<b>119,700</b>	<b>160,000</b>	<b>109,200</b>	<b>119,200</b>	<b>149,800</b>

Note: assuming the commissioning in the third quarter of 2018.

**Table 3 - Fare assumptions**

Destination	XRL Assumed Fares (HK\$)
Shenzhen (Futian and Shenzhen North)	53-57
Dongguan (Humen)	153
Guangzhou (Guangzhou South)	210

8. Apart from fare revenue, the operating revenue also includes non-fare revenue, which includes railway-related commercial activities such as advertising, kiosks, rental income of telecommunication facilities, etc. For the non-fare revenue estimate in 2009, we made reference to rental income of commercial area

of the airport and other major MTRCL's stations at that time. As regards the operating cost, in the forecast of operating effectiveness in 2009, the estimate was based on the relevant cost data provided by the MTRCL. Operating cost includes energy (includes electricity cost for the WKT, tunnels and trains), operating and maintenance (includes the WKT, tunnels and trains), staff (includes salary for operational and maintenance staff), supporting services (include supporting services from headquarters), rates (including estimated rent and rates of the operating surplus from railway operations) etc.

9. We also base on the assumptions adopted in 2009 with consideration of inflationary factors to update the non-fare revenue and operating cost, and so update the operating profit (in terms of EBITDA) and operating margins of the XRL project. Details are illustrated in **Table 4**.

**Table 4 – Operating profit and operating margins of the XRL project estimated in 2015**

	<b>2018<sup>Note</sup></b>	<b>2021</b>	<b>2031</b>
<b>Operating Revenue</b>	<b>0.358</b>	<b>2.129</b>	<b>3.560</b>
Fare revenue	0.347	2.036	3.271
Non-fare revenue	0.011	0.093	0.289
<b>Operating Cost</b>	<b>(0.208)</b>	<b>(0.937)</b>	<b>(1.487)</b>
Energy	(0.038)	(0.168)	(0.246)
Non-staff Operating and Maintenance	(0.076)	(0.334)	(0.528)
Staff Cost	(0.043)	(0.196)	(0.322)
Support Services	(0.044)	(0.199)	(0.320)
Rates	(0.007)	(0.040)	(0.071)
<b>EBITDA</b>	<b>0.150 (one quarter)</b>	<b>1.192</b>	<b>2.073</b>
<b>Operating Margin<sup>4</sup></b>	<b>42%</b>	<b>56%</b>	<b>58%</b>

Figure in \$ billion (money of the day)

<sup>4</sup> Operating Margin =  $\frac{\text{Operating Revenue} - \text{Operating Cost}}{\text{Operating Revenue}} \times 100\%$

Note: assuming commissioning in the third quarter of 2018, the estimate only covers the fourth quarter of 2018.

10. The above operating revenue and operating cost are assumptions used in planning and design. The future actual figures are subject to actual operation arrangements and situation.

11. EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation), i.e. operating revenue minus operating cost, is an appropriate and well accepted indicator of the operational performance of infrastructure projects like the XRL. It can show whether recurrent cash subsidy is necessary to keep the railway in operation. The projected positive EBITDA suggests that the operation of the XRL can be sustained without subsidy. Based on the above estimate, even if the patronage is slightly lower than expected, it is unlikely that the operating revenue will drop below the operating cost and hence resulting in operating loss. The current EBITDA assessment result is more or less the same as the assessment result in 2009 (see **Table 5**).

**Table 5 – EBITDA and operating margins of the XRL project estimated in 2009**

	<b>2016</b>	<b>2021</b>	<b>2031</b>
<b>EBITDA</b>	<b>0.385</b>	<b>1.183</b>	<b>2.188</b>
<b>Operating Margin</b>	<b>34%</b>	<b>57%</b>	<b>61%</b>

Figure in \$ billion (money of the day)

12. A Member asked for the interest expenses, tax expenses, as well as the expenses of capital depreciation for the XRL during operation. From the Government’s point of view, the construction of the XRL is a public works project funded by the Capital Works Reserve Fund. It does not involve borrowing of money to pay for the construction cost, hence there will not be interest to be paid. For tax expenses, as the Government does not need to pay tax for its own project, there will not be any expenditure on tax. For capital depreciation, according to the accounting principle adopted by the Government, the Government depreciates its fixed assets over, mainly, 50 years in its



accrual-based accounts. However, the year for depreciation of the XRL project has yet to be decided. Nevertheless, depreciation will not involve cash expenditure during operation.

### **Train Procurement**

13. Under the XRL project, the Hong Kong side procures nine sets of 8-car high speed trains. The contract was awarded to CSR Sifang Qingdao Locomotive Company Ltd. after an international tendering process. The awarded contract sum was \$1.744 billion. The highest operating speed for the trains is 350 kilometres per hour (“kph”) and the maximum operating speed in the Hong Kong Section is 200 kph. The trains procured by the Hong Kong side will provide short haul services between Hong Kong and Gaungzhou South. According to the current planning, the future XRL operation will include short haul and long haul service. The train procured by the Hong Kong side will be used in short haul trips.

### **Train Maintenance**

14. According to the recommendations by the consultant of the MTRCL on the maintenance arrangements of high speed trains for the XRL, the periodical maintenance of the high speed trains are performed based on the operating mileages and time. The consultant recommended that the XRL equip with low level maintenance facilities to be provided at the Shek Kong Stabling Sidings (“SSS”) while high level maintenance are to be performed at high speed trains maintenance depots in Mainland. The maintenance to be performed at SSS included the replacement of consumables, machinery adjustment, replenishment, etc. It also includes basic inspection and repair (such as car body, bogie, coupler, brake, etc.). The high level maintenance to be performed in Mainland includes replacement of bogie, inspection and maintenance of major systems equipment, tests for train characteristics, extensive replacement of parts, painting of car body, etc.

**Transport and Housing Bureau  
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