LC Paper No. CB(1)1542/11-12(01)

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10 April 2012

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Clerk to Subcommittee
Subcommittee on Matters Relating to Railways
Panel on Transport
Legislative Council Secretariat
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Attn: Ms Joanne MAK)

Dear Ms MAK,

Panel on Transport
Subcommittee on Matters Relating to Railways
Matters Arising from the Meeting on 30 March 2012

Shatin to Central Link – Funding Application for the Main Works

I refer to the questions raised by the members regarding the Shatin to Central Link (SCL) at the meeting of the Subcommittee on Matters Relating to Railways held on 30 March 2012 and would like to provide the following supplementary information.

How to bring down the rate of project management cost from 16.5% to 10.5%

2. Before the Rail Merger, railway projects were all implemented by using the ownership approach. There was no precedent case on entrusting the main railway works of a Government-funded railway project to railway corporations. Therefore, all the railway works entrusted by the Government to the two railway corporations before the Rail Merger were limited to the essential public infrastructure works (EPIW), such as construction of pedestrian footbridges or subways connecting with railway stations, public transport interchanges and road works in the vicinity of railway stations. The rate of project management cost (PMC) payable by the

Government to the two railway corporations were calculated on the basis of 16.5% of the construction cost of the works.

3. After the Rail Merger, four railway projects have commenced construction. They are the West Island Line, the Hong Kong section of the Guangzhou – Shenzhen - Hong Kong Express Rail Link, the South Island Line (East) and the Kwun Tong Line Extension. For these four projects, the Government had commissioned independent consultants to assess the project estimates including the PMC. Based upon the scale, characteristics and complexity of the projects concerned, the consultants estimated the manpower resources required which were then used to calculate the PMC required for the projects. The assessment indicated that the rates of PMC for these four projects ranged between 7.4% and 12.4% of the estimated construction cost. While the PMC rates for these projects are lower than the previous adopted rate of 16.5% as a result of economy of scale, the consultants' assessments on the PMC indicated that the manpower resources required for individual project were related to the characteristics and complexity of the project concerned. It is inappropriate to strictly adhere to a pre-set rate to calculate the PMC required for the project.

4. In the discussions with the MTR Corporation Limited (MTRCL) on the PMC of the SCL, we have requested the MTRCL to explore in great depth the scope of reducing the PMC without compromising supervision quality and management standard, having regard to the characteristics and scale of the project including considerations on the contractual planning and deployment of manpower resources. We have also requested the MTRCL to submit a manpower resources plan for the SCL in the light of this principle and with due consideration of streamlining the supervision hierarchy and cost control processes so that the rate of PMC can be compressed to below 16.5%.

5. After rounds of discussion, the MTRCL put forward a manpower resources proposal with a PMC amounting to $6,612.2 million (at September 2011 prices). Comparing against the estimated construction cost of the whole project, this manpower resources proposal pitched at a PMC rate of 11.4%. This proposal was submitted to the independent consultant for scrutiny.

6. The independent consultant had carefully studied the detailed design of the SCL project and completed the assessment on the MTRCL's PMC proposal with due consideration given to technical requirements, complexity of works, construction risks and constraints, demand of manpower resources, etc.

7. After the assessment, the independent consultant recommended to further streamline the supervision and management hierarchy of the SCL project. With such streamlining process, the PMC could be reduced by a total of $515 million. The PMC would be reduced to $6,097.2 million (at September 2011 prices) for the ten-year construction period of the SCL. This amount represents about 10.5% of the overall construction cost of the SCL project. The independent consultant considered such PMC level reasonable and recommended it to the Government. The PMC, after the

independent consultant's assessment, was reduced by 7.8% in comparison with the original proposal of $6,612.2 million submitted by the MTRCL. Table 1 shows the details of the reduction.

Table 1

Item	Reduction in cost of manpower resources in comparison with MTRCL's original proposal	
	Amount ($ million)	Percentage reduction
Works under the "East West Corridor"	62	1.0%
Works under the "North South Corridor"	359.2	5.4%
Contract Management and Support	93.8	1.4%
Total	515	7.8%

8. There is an opinion that it would be more appropriate to introduce a sliding scale for determining the PMC. The higher the construction cost, the lower should be the PMC rate. As individual mega project has its own needs, difficulties, requirements and scale, it is not feasible to apply a fixed percentage of the construction cost for determining the PMC. In order to derive a reasonable level of PMC, we have to assess the scale of the project, degree of complexity, potential risks, stakeholders' requirement, etc in the first place, then prepare a plan on manpower resources. After going through these steps, we will be able to accurately assess the PMC required. The assessed PMC rate for the SCL project is solely for the sake of presentation so that the public may compare the level of PMC for different projects. It should be noted that throughout the entire process of assessing the amount of PMC, we did not involve the use of this rate as a basis of assessment. The PMC we are now applying for is a fixed sum and will not fluctuate with the actual construction cost, unless there is a substantial change in the project scope.

Seating configuration in train compartments of Hong Kong railways

9. Mass transit system not only provides safe, reliable, convenient and speedy service, but also carries a large number of passengers to help reduce road traffic and emissions to the environment. In 2011, the railway lines (light rail transit not included) in Hong Kong on average handled over 4 million passenger trips per day. The railway service shares about 37% of the local market on public transport, performing the role as the backbone of the transportation system in Hong Kong.

10. To make better use of mass transit system, railway lines (in particular urban lines) are characterized by having more stations and frequent services to offer convenience to passengers. Especially during rush hours, railway lines provide reliable and speedy service to take care of a huge number of people urging for work and school. At the moment, for the most congested section of the railway system,

such as the Island Line, the Tsuen Wan Line and the East Rail Line, each rail handles a patronage as high as 50 000 in the busiest hour of the day. To take care of such a big volume of passenger flow, the MTRCL has to arrange very frequent train service to serve passengers. Currently, the most frequent train service is at an interval of about 2 minutes to meet passenger demand. In fact, internationally, the peak demand exceeding 50 000 passengers for railways is not very common. For example, in Paris, its busiest line, route no. 1, has a capacity of about 33 000 per hour. In Singapore, its railway has a maximum capacity of about 40 000 per hour. Some metro lines in Tokyo, like Tozai, Yurakucho and Chiyoda, have the peak patronage exceeding 50 000 per hour. The train frequency for these railway lines at rush hours is also at about 2 minutes, which is comparable with that of the Hong Kong railways.

11. At present, the train compartments of the urban railway lines in Hong Kong adopt the side-bench configuration for seating arrangement (like the design of the Island Line). This is to allow space to accommodate a large volume of passengers, and make it more convenient for passengers to get on/off the train. To increase the number of seats inside train compartments, it may have to switch to the row configuration for seating arrangement (like the design in the inter-city service in the East Rail Line). Comparing with the row configuration, side-bench configuration allows greater capacity for carrying passengers and facilitates more effective passenger movement. This is more suitable for handling the current situation in which the peak patronage exceeds 50 000 per hour during the peak period. As constrained by the limited platform length that can be constructed in the congested urban areas, the urban railway lines in Hong Kong are in general operating 8-car train configuration. With the given platform length, the possibility of adding additional cars is very low. In addition, to maintain sufficient safety separation between trains, the room to increase train frequency during rush hours is limited as the trains are already running at an interval of 2 minutes. If we switch to the row configuration from the current side-bench seating configuration, it may experience difficulties in handling the peak patronage of over 50 000 per hour.

12. Furthermore, the number of doors at each train compartment will affect the provision of seats. In fact, the number of train doors and distribution of seats within train compartments are among the factors that contribute to how frequent that the trains can operate. In general, sub-urban railway lines (such as the Kowloon-Canton Railway prior to electrification) and intercity lines (such as the existing East Rail Line inter-city service) provide less frequent services and serve longer journeys. The distance between stations is longer and passengers will stay in the train for a longer time. The patronage in general is not very high. In this regard, each train compartment may have fewer doors to provide more space for seats to be arranged in rows. However, there is a great difference for the urban lines. Worldwide, urban lines have the common characteristics of high patronage, short stay of passengers, frequent train service and short distance between stations. In order to provide frequent train service at rush hours, the dwell time for trains needs to be shortened. To meet this requirement, urban lines usually have more doors which are distributed evenly, together with the side-bench seating arrangement, to allow more circulation

areas for passengers so that the train frequency can be increased to as close as 2 minutes. As a result, many countries adopt the side-bench configuration for seat arrangement in their busy urban railway lines.

13. Hong Kong railways are no exception. In the 1980s, the East Rail Line still adopted the 3-door configuration. Afterwards, because of the growing passenger demand, the 3-door configuration could not meet the requirement for boarding/alighting movement of passengers. Thus, the design switched to the 5-door configuration. At the moment, the MTRCL adopts the 5-door configuration for all its trains. Besides, in the recent two to three years, to address the special needs of wheelchair and baby stroller users, the MTRCL re-configured the train compartments to allow for multi-purpose areas for these passengers. After various trials, the MTRCL has made effort to provide as many seats as possible in the train compartments while balancing the different needs of passengers. At present, Hong Kong railways offer 45 to 50 seats in each train compartment. This is comparable with those recently built railway lines in other places worldwide serving similar level of patronage. For example, the number of seats offered in Hong Kong railways is similar to that in Singapore, Tokyo, Beijing and Shanghai.

East Rail Line passenger flow calculation

14. There is an opinion that the annual growth rate of 1.5% adopted to project the patronage growth of the East Rail Line after the operation of the SCL seems to be on the low side. Such projection may not match the future demand arising from the developments along the East Rail Line and the growth of cross boundary patronage.

15. In making a long term patronage forecast for a railway line, it is a common practice internationally to adopt the "4-stage transport model". The estimation under this model will take into account different factors and forecasts including population and employment figures as well as the socio-economical parameters, the social and economic integration between Hong Kong and the Mainland, distribution of transport facilities, travelers' commuting habits, and choices of different routes and interchanging arrangements. Through the detailed assessment, we then obtain a reasonable long term projection. In making a patronage projection for the East Rail Line after the operation of the SCL, we adopt the "4-stage transport model" as well.

16. In the past ten years, the busiest section of the East Rail Line recorded an average patronage growth of about 1% per annum. In this regard, it is an optimistic estimation for the Government to adopt an annual growth rate of 1.5% the for long term projection of patronage growth in the East Rail Line. In fact, the annual growth rate of 1.5% constitutes a compound rate of growth. It represents a total growth of 14% in 10 years' time and 32% in 20 years' time (Table 2). Such a long term growth is apparently on the high side for a mature railway with relatively stable developments along the route.

Table 2

Year	Patronage of the busiest section north of Tai Wai during morning peak (southbound) (hourly flow)	Percentage growth comparing with 2011 patronage
2011	39 500 passenger trips	-
2020 (commissioning of the SCL)	45 000 passenger trips (Forecast)	About 14%
2030	52 000 passenger trips (Forecast)	About 32%

Yours sincerely,

(S H LAM)
for Secretary for Transport and Housing

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