

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Railways

56TR – South Island Line (East) – essential public infrastructure works

Members are invited to recommend to Finance Committee to increase the approved project estimate of **56TR** by \$286.2 million from \$927 million to \$1,213.2 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **56TR** is not sufficient to cover the cost of the works under the project.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to increase the APE of **56TR** by \$286.2 million from \$927.0 million to \$1,213.2 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In April 2011, the Finance Committee (FC) of the Legislative Council (LegCo) approved the upgrading of **56TR** to Category A and named the project as “South Island Line (East) – essential public infrastructure works” at an estimated cost of \$927 million in MOD prices.

4. The scheme of South Island Line (East) (SIL(E)) consists of a railway line of seven kilometres running from Admiralty to South Horizons with three intermediate stations at Ocean Park, Wong Chuk Hang and Lei Tung Estate. Passengers can interchange at Admiralty Station for the existing Island Line, Tsuen Wan Line and the future Shatin to Central Link. The schematic layout of the SIL(E) is at Enclosure 1.

5. To tie in with the commissioning of the SIL(E), we need to provide a safe, convenient and barrier free access to the SIL(E) stations through enhancement of pedestrian and transport links to the railway line, so that the consequential social and economic benefits of the SIL(E) can be fully realised. The approved scope of **56TR** includes -

Wong Chuk Hang Station area

- (a) construction of a public transport interchange¹ (PTI) with floor area of about 2 200 square metres (m²) underneath Wong Chuk Hang Station, including –
 - (i) a double-width bus bay of 12 metres in length for accommodating eight buses;
 - (ii) a green minibus (GMB) bay for accommodating four GMBs;
 - (iii) a taxi stand for accommodating six taxis;
 - (iv) a general loading/unloading bay of 30 metres in length; and
 - (v) associated road, drainage, street lighting, electrical and mechanical and landscaping works;
- (b) improvement of the existing road network in the vicinity of Ocean Park Station and Wong Chuk Hang Station, including –

/ (i)

¹ The PTI is now named as public transport facilities. The change of the name does not have any impact on the daily operation of public transport service.

- (i) widening of a section of Heung Yip Road which is about 650 metres in length from one lane each way to two lanes each way;
 - (ii) realignment of a section of Wong Chuk Hang Road which is about 310 metres in length;
 - (iii) realignment of a section of Ocean Park Road which is about 250 metres in length;
 - (iv) realignment and widening of a section of Nam Long Shan Road which is about 150 metres in length;
 - (v) realignment and widening of a section of Police School Road which is about 200 metres in length;
 - (vi) modification to the road junctions at Heung Yip Road/Ocean Park Road, Heung Yip Road/Police School Road, Heung Yip Road/Nam Long Shan Road, Wong Chuk Hang Road/Nam Long Shan Road, and Wong Chuk Hang Road/Tong Bin Lane; and
 - (vii) associated road, drainage, street lighting, geotechnical, slope and landscape works;
- (c) modification of a section of the existing Wong Chuk Hang Nullah which is about 650 metres in length between Ocean Park Road and Nam Long Shan Road;
- (d) construction of a covered footbridge of about 180 metres in length connecting Wong Chuk Hang Station to the adjacent industrial area, which also includes –
- (i) a staircase and a lift at Wong Chuk Hang Road adjacent to Regency Centre;
 - (ii) a staircase and a lift at the existing Nam Long Shan Road sitting-out area;

/ (iii)

- (iii) a staircase and a lift adjacent to Nam Long Shan Road Cooked Food Market; and
- (iv) re-provisioning of the Nam Long Shan Road sitting-out area;

South Horizons Station area

- (e) construction of a covered footbridge² of about 80 metres in length across South Horizons Drive, linking the western part of Ap Lei Chau Estate to Yi Nam Road near Precious Blood Primary School, which also includes –
 - (i) a staircase and a lift adjacent to Precious Blood Primary School;
 - (ii) re-provisioning of the existing Ap Lei Chau Estate sitting-out area; and
 - (iii) associated road and drainage works;

Aberdeen Channel waterfront area

- (f) construction of a pedestrian link to Aberdeen Channel Promenade comprising –
 - (i) a covered footbridge of about 36 metres in length;
 - (ii) a walkway of about 800 metres in length between Wong Chuk Hang Station and Kwun Hoi Path;
 - (iii) an open space³ of 1 140 m² and a lookout point at the Aberdeen Channel waterfront; and

/ (iv)

² After the detailed design, the length of the covered footbridge link to Ap Lei Chau Estate is revised to 50 metres.

³ After the detailed design, the area of the open space at the side of the pedestrian link to Aberdeen Channel Promenade is revised to 1 190 m².

- (iv) associated drainage and landscaping works;

Lei Tung Station area

- (g) road improvement works at the road junction of Ap Lei Chau Drive and Ap Lei Chau Bridge Road.

_____ The Government entrusted the MTR Corporation Limited (MTRCL) to carry out the above essential public infrastructure works (EPIW). The location plan of the EPIW is at Enclosure 2.

JUSTIFICATIONS

6. Following a detailed review of the financial position, we consider that it is necessary to increase the APE of **56TR** by \$286.2 million (in MOD prices), to cover the increase in expenses mainly arising from the following reasons –

- (a) unfavourable ground conditions;
- (b) underground utilities more complicated than expected;
- (c) change in design to suit the actual site conditions;
- (d) increase in provision for price adjustments; and
- (e) adjustment of the on-cost payable to MTRCL.

Details of the increase in APE are set out in paragraphs 7 to 12 below.

Unfavourable ground conditions

7. The unfavourable ground conditions have mainly affected the bulk excavation and pile foundation works for the modification works of the Wong Chuk Hang Nullah. In preparing the project estimate for **56TR**, we adopted the site investigation information available at that time for the design of the modification works of Wong Chuk Hang Nullah. At the design stage, MTRCL followed the Geoguide compiled by the Geotechnical Engineering Office (GEO) to carry out the ground investigation and set the total number of drill holes as recommended by the guide. However, in order to minimise the impact on the Nullah's flood control function, and to avoid disturbing the intricate underground

/ utilities

utilities network and the road traffic, the extent and locations of the site investigation works were compromised. During the construction stage, unforeseen large boulders and corestones were identified by the contractor underneath the nullah. As a result, the original construction programme had to be modified to allow for the removal of boulders and corestones before the piles could reach the bedrock stratum of sufficient bearing capacity.

8. Besides, as the bedrock stratum of sufficient bearing capacity for piles was deeper than expected, longer piles had to be deployed. The progress of the piling works was also hampered and behind schedule. As a result, the subsequent modification works of Wong Chuk Hang Nullah could not be carried out in a dry season. To avoid further delay, the contractor adopted hanging falseworks, which were more expansive than traditional scaffoldings, so that modification works of the Nullah could continue during the wet season without affecting its flood control function. In this connection, the contractor employed additional manpower, altered the construction method, and deployed extra machinery and materials to complete the works. The unfavourable ground conditions cause an increase in cost by \$64.5 million.

Underground utilities more complicated than expected

9. When designing the road network in the vicinity of Ocean Park Station and Wong Chuk Hang Station, MTRCL collected information from the public utility companies and stakeholders about the existing utilities within the scope of the road works. In parallel, trial trenches/pits were carried out on the footpaths to verify the accuracy of the utilities records. Although information had been collected before works commencement, the contractor encountered substantial amount of uncharted utilities underneath Nam Long Shan Road, Heung Yip Road, Ocean Park Road, Police School Road and Wong Chuk Hang Road, etc. in the course of construction. It was necessary for the contractor to liaise with the public utility companies for suspension of some of the public utilities concerned, and to modify and lengthen the period of the relevant temporary traffic management schemes, so that the public utility companies can carry out the diversion works. The progress of the works was therefore adversely affected. Some of the design and construction methods had to be modified to suit actual site conditions. For the drainage works at Nam Long Shan Road in Wong Chuk Hang, owing to the discovery of a lot of uncharted utilities, trenchless method instead of open cut method had to be adopted for the pipe laying works, in order to minimise the impact on road traffic. As a result, the contractor had to employ additional labour, alter the construction methods and deploy extra machinery to complete the works. The cost of the works was increased by \$79.4 million.

Change in design to suit the actual site conditions

10. During the construction of the EPIW, variations and enhancements to the design and construction methods were made to suit the actual site conditions. For instance, at the semi-open PTI underneath Wong Chuk Hang Station, the construction team considered necessary to enhance the fire prevention facilities⁴ during the construction stage. Apart from that, for the road improvement works in Wong Chuk Hang and Ap Lei Chau areas, a number of street lights were added in view of the actual site conditions after conducting site visits. The cost of the works was increased by \$33.1 million.

Increase in provision for price adjustments

11. When the estimate of the project was prepared in 2011, a provision of \$91.4 million was allowed for price adjustments based on the “price adjustment factors” available at that time and the cash flow pattern. Due to the above factors causing costs increase in the construction of EPIW, together with the changes in construction procedures, the cash flow pattern of the EPIW was then different from the original one and we needed to increase the provision for price adjustments. Based on the latest project estimate, cash flow and the “price adjustment factors” compiled by the Government in September 2016, the provision for price adjustments will increase by \$136.1 million, i.e. from 91.4 million to \$227.5 million. Details of the latest cash flow of the project and the latest provision for price adjustments are at Enclosure 3.

Adjustment of the on-cost payable to MTRCL

12. The on-cost⁵ payable to the MTRCL stated in the funding application in 2011 was \$107.6 million. With the increased construction cost and extended construction period of the EPIW, an additional design and management cost of \$29.1 million for the whole project is required.

/ Use

⁴ Fire prevention facilities include fire sprinklers, fire alarms, fire pumps, gas-oriented fire prevention system, fire service installation rooms, drainage system, power distribution equipment, backup power supply, lighting system and communication system.

⁵ An on-cost at 16.5% of the project base cost is payable to MTRCL for undertaking the design and construction supervision of the EPIW.

Use of contingencies

13. Some of the contingencies (i.e. \$76.0 million) under the original APE have been committed to cater for the additional costs arising from the above factors. With the substantial completion of the EPIW, the remaining provision on contingencies of \$20 million would be sufficient to serve as contingency.

SUMMARY OF FINANCIAL POSITION

14. All in all, a breakdown of the proposed increase of \$286.2 million is as follows –

Factors	Proposed increased amount/savings in MOD prices (\$ million)	Percentage of the increased amount/savings (%)
Increase due to -		
(a) unfavourable ground conditions	64.5	18.8
(b) underground utilities more complicated than expected	79.4	23.2
(c) change in design to suit the actual site conditions	33.1	9.7
(d) increase in provision for price adjustments	136.1	39.8
(e) adjustment of the on-cost payable to MTRCL	29.1	8.5
(f) Total increase (f)=(a) + (b) + (c) + (d) + (e)	<hr/> 342.2	<hr/> 100.0
(g) Amount paid by contingencies	56.0	
(h) Proposed increase (h) = (f) – (g)	<hr/> 286.2 <hr/>	

A comparison of the cost breakdown of the original APE and the revised project estimate is at Enclosure 4.

/ **FINANCIAL**

FINANCIAL IMPLICATIONS

15. Subject to funding approval, we will revise the phased expenditure as follows –

Year	\$ million (in MOD prices)
Up to 31 March 2016	807.6
2016 – 17	106.6
2017 – 18	95.7
2018 – 19	98.9
2019 – 20	104.4
	<hr/> 1,213.2 <hr/>

16. The proposed increase in APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

17. We consulted the Subcommittee on Matters Relating to Railways (RSC) of the Panel on Transport of LegCo on the proposed increase in APE of **56TR** on 9 December 2016. The Subcommittee supported submitting the funding proposal to the Public Works Subcommittee (PWSC) for examination. The supplementary information required by the Members would be submitted to RSC before the PWSC meeting.

ENVIRONMENTAL IMPLICATIONS

18. The proposed increase in APE will not have any environmental implication.

ENERGY CONSERVATION MEASURES

19. The proposed increase in APE will not lead to any energy conservation measure.

HERITAGE IMPLICATIONS

20. The proposed increase in APE will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

21. The proposed increase in APE will not require any land acquisition or clearance.

BACKGROUND INFORMATION

22. The FC approved the upgrading of **56TR** to Category A at an estimated cost of \$927 million in MOD prices in April 2011. We have kept the LegCo informed of the progress of the EPIW of the SIL(E). The background information of the EPIW of the SIL(E) is at Enclosure 5.

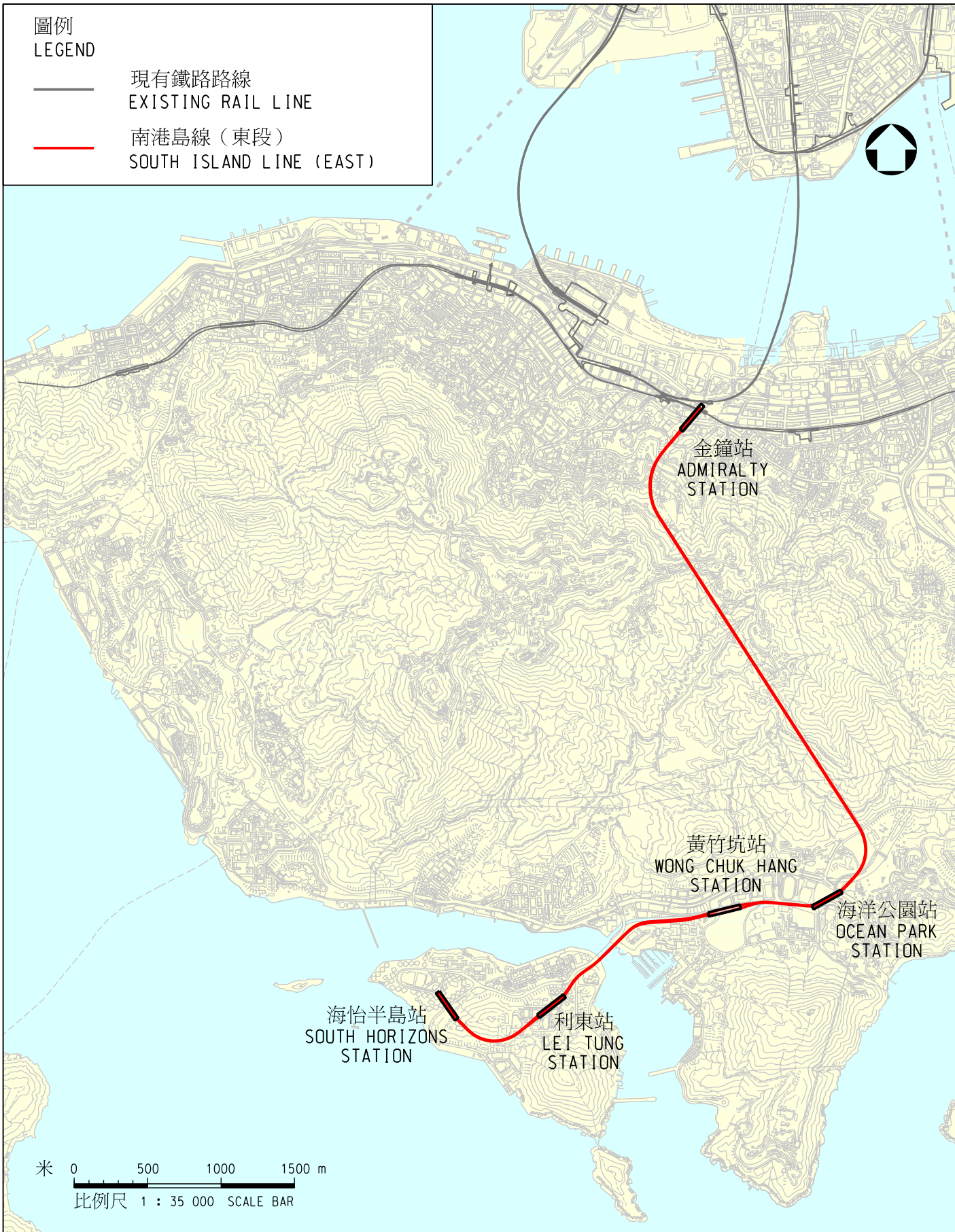
23. The proposed increase in APE will not involve any additional tree removal.

24. The proposed increase in APE will not involve the creation of any professional and technical post or job opportunity.

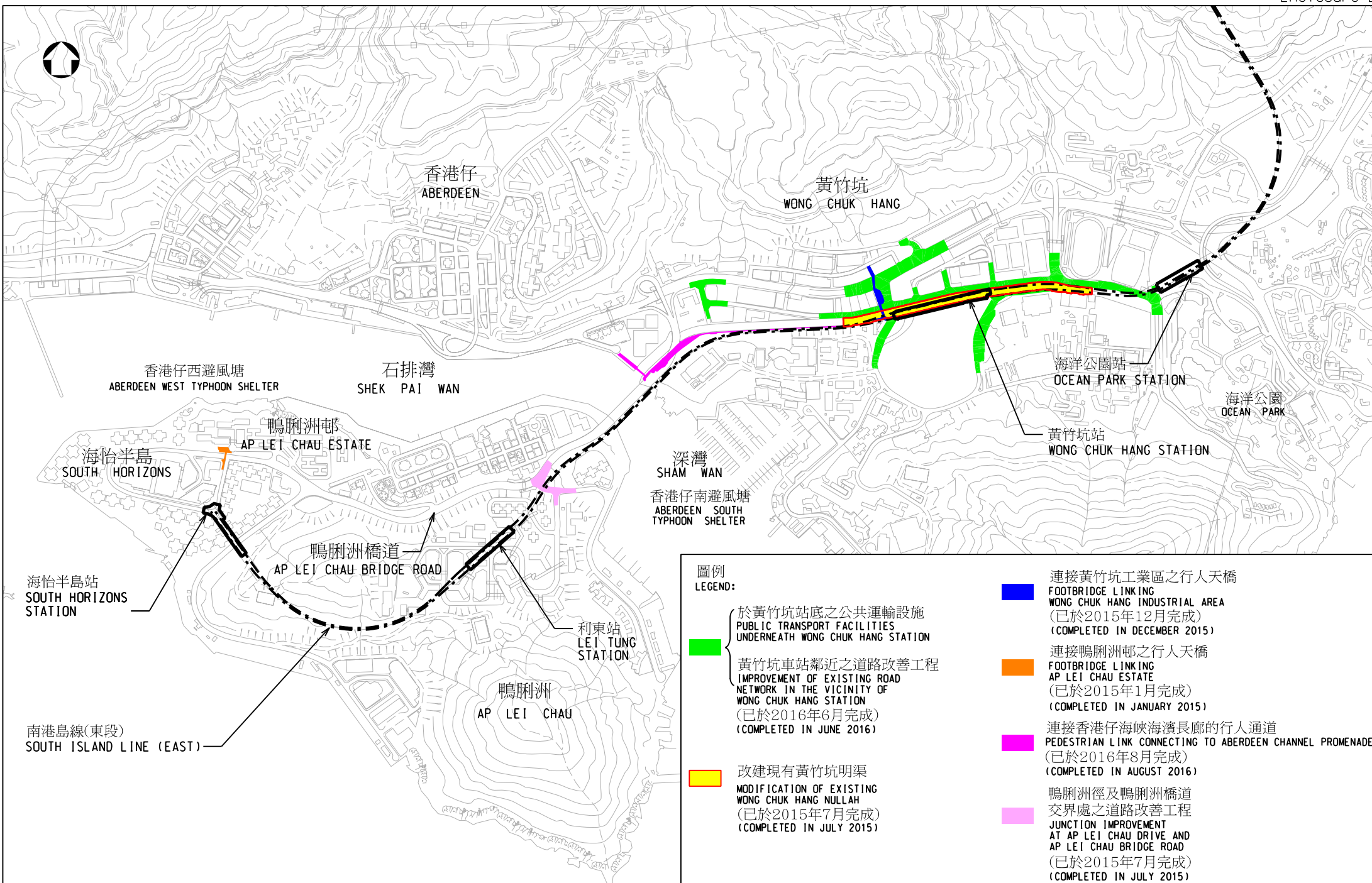
Transport and Housing Bureau
January 2017

圖例
LEGEND

- 現有鐵路路線
EXISTING RAIL LINE
- 南港島線（東段）
SOUTH ISLAND LINE (EAST)



南港島線（東段）
SOUTH ISLAND LINE (SIL) (EAST)



南港島線(東段) - 主要基建工程

SOUTH ISLAND LINE (EAST) - ESSENTIAL PUBLIC INFRASTRUCTURE WORKS

56TR – South Island Line (East) – essential public infrastructure works**Table 1 - Cash flow and provision for price adjustment in PWSC (2010-11)33**

Year	Original project estimate (in September 2010 prices) (\$ million) X	Original price adjustment factors (October 2010) # Y	Approved project estimate (in MOD prices) (\$ million) Z	Provision for price adjustment (\$ million) A = Z - X
2011 – 2012	254.8	1.04250	265.6	10.8
2012 – 2013	288.3	1.09463	315.6	27.3
2013 – 2014	186.6	1.14936	214.5	27.9
2014 – 2015	79.7	1.20682	96.2	16.5
2015 – 2016	13.2	1.27169	16.8	3.6
2016 – 2017	5.0	1.34163	6.7	1.7
2017 – 2018	5.0	1.41542	7.1	2.1
2018 – 2019	3.0	1.49327	4.5	1.5
Total	835.6		927.0	91.4

Table 2 – Latest cash flow and provision for price adjustment due to latest project estimate (PE) and latest price adjustment factors

Year	Latest Project Estimate (PE) (in September 2010 prices) (\$ million) a	Latest PE (in September 2016 prices) (\$ million) ^^ B	Latest price adjustment factors (September 2016) ## c	Latest PE (in MOD prices) (\$ million) d	Latest provision for price adjustment (\$ million) e	Net increase in provision for price adjustment (\$ million) f
Up to March 2016	712.3^	807.6^	1.00000	807.6	e = d - a	f = e - A
2016 – 2017	78.1	106.6^^	1.00000	106.6		
2017 – 2018	66.3	90.5^^	1.05750	95.7		
2018 – 2019	64.6	88.2^^	1.12095	98.9		
2019 – 2020	64.4	87.9^^	1.18821	104.4		
Total	985.7	1,180.8		1,213.2	227.5	136.1

Notes:

- # Price adjustment factors adopted in October 2010 were based on the projected movement of prices for public sector building and construction output at that time, which were assumed to increase by 2.0% per annum in 2010, 5.0% from 2011 to 2014 and 5.5% from 2015 onwards.
- ## Price adjustment factors adopted in September 2016 were based on the latest movement of prices for public sector building and construction output, which was assumed to increase by 6.0% per annum over the period from 2017 to 2020.
- ^ \$712.3 million was the actual expenditure (excluding price adjustment) up to March 2016; whereas \$807.6 million was the actual expenditure (including price adjustment).
- ^^ The September 2016 prices are converted by multiplying the latest project estimate (in September 2010 prices) by 1.36537. The figure of 1.36537 represents the changes in price movement for public sector building and construction output between September 2010 and September 2016.

56TR – South Island Line (East) – essential public infrastructure works**Comparison between Approved Project Estimate and the latest project estimate**

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)	
(a) PTI underneath Wong Chuk Hang Station		18.7	32.7	14.0
(i) road, bus bays, minibus bay, taxi stand, loading/unloading bays	5.5	4.7	(0.8)	
(ii) drainage, street lighting, E&M and landscaping works	13.2	28.0	14.8	
(b) Improvement of the existing road network in the vicinity of Wong Chuk Hang station		73.7	112.7	39.0
(i) junction modification	14.3	42.5	28.2	
(ii) road, drainage, street lighting, geotechnical, slope works and landscaping works	59.4	70.2	10.8	
(c) Modification of existing Wong Chuk Hang Nullah		415.8	508.1	92.3
(i) foundation	100.1	154.5	54.4	
(ii) decking works	250.8	279.9	29.1	
(iii)road, drainage and landscaping works	64.9	73.7	8.8	
(d) Footbridge link to Wong Chuk Hang industrial area		69.3	89.8	20.5
(i) footbridge	50.6	76.7	26.1	
(ii) road, drainage and landscaping works	18.7	13.1	(5.6)	
(e) Footbridge link to Ap Lei Chau Estate		16.5	28.6	12.1
(i) footbridge	14.5	26.5	12.0	
(ii) drainage and landscaping	2.0	2.1	0.1	

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(f) Pedestrian link		53.0	46.7
(i) footbridge	5.0	8.2	3.2
(ii) road, drainage and landscaping works	48.0	38.5	(9.5)
(g) Junction improvement at Ap Lei Chau Drive and Ap Lei Chau Bridge Road		5.0	10.4
(h) On-cost payable to MTRCL		107.6	136.7
(i) Contingencies		76.0	20.0
Sub-total		835.6	985.7
	(in September 2010 prices)	(in September 2010 prices)	
(j) Provision for price adjustment		91.4	227.5
Total		927.0	1,213.2
	(in MOD prices)	(in MOD prices)	

As regards **item (a) PTI underneath Wong Chuk Hang Station**, the increase of \$14.0 million is mainly due to the enhancement of the fire prevention facilities of the PTI.

2. As regards **items (b) and (c), improvement of the existing road network in the vicinity of Wong Chuk Hang station and modification of existing Wong Chuk Hang Nullah**, the increase of \$131.3 million is mainly due to the unfavourable ground conditions and the underground utilities being more complicated than expected.

3. As regards **item (d) footbridge link to Wong Chuk Hang industrial area; item (e) footbridge link to Ap Lei Chau Estate; item (f) pedestrian link; and item (g) junction improvement at Ap Lei Chau Drive and Ap Lei Chau Bridge Road**, the net increase of \$31.7 million is mainly due to design changes to suit actual site conditions and the underground utilities being more complicated than expected.

4. As regards **item (h) on-cost payable to MTRCL**, the increase of \$29.1 million is an adjustment to the payment for MTRCL's services according to the Entrustment Agreement.

5. As regards **item (i) contingencies**, we drew down \$56.0 million from the contingencies to partly cover the cost increase in the items mentioned above.

6. As regards **item (j) provision for price adjustment**, an increase of \$136.1 million in price adjustment is based on the increase in the latest price adjustment factors promulgated by the Government, as well as the latest anticipated cash flow of the project.

56TR–South Island Line (East) – essential public infrastructure works

Background information

Progress of the Works

The Government entered into an agreement with MTRCL in May 2011 to entrust the design and construction of the EPIW to MTRCL. This would ensure better coordination between the EPIW and SIL(E) project and that their construction works can be carried out in tandem. The construction of the EPIW and the railway works of SIL(E) commenced in 2011. Each of the EPIW has been gradually completed and opened for public use from January 2015 to August 2016, with a view to dovetailing with the commissioning of the SIL(E).

PTI underneath Wong Chuk Hang Station

2. To facilitate the citizens to use the SIL(E) and other modes of public transport, we have constructed a PTI underneath Wong Chuk Hang Station. The PTI will serve both the local residents in the Wong Chuk Hang area as well as the working population in the Wong Chuk Hang industrial area.

Improvement of the existing road network in the vicinity of Ocean Park Station and Wong Chuk Hang Station

3. To cope with the anticipated traffic growth in the existing road network in the vicinity of Ocean Park Station and Wong Chuk Hang Station upon the commissioning of the SIL(E), we have widened and/or realigned a number of roads, namely Heung Yip Road, Wong Chuk Hang Road, Ocean Park Road, Nam Long Shan Road, Tong Bin Lane and Police School Road, as well as modified some critical road junctions to increase traffic capacity. The existing footpaths at these roads will also be widened to enhance pedestrian flow and to provide extra space for landscaping works to create a better walking environment for pedestrians.

/ Modification

Modification of the existing Wong Chuk Hang Nullah

4. To provide the necessary space for the construction of the PTI underneath Wong Chuk Hang Station and for the widening of Heung Yip Road as mentioned in paragraphs 2 and 3 above, we have widened and modified a section of existing Wong Chuk Hang Nullah alongside Heung Yip Road, which is about 650 metres in length, and have turned it into a decked structure. By doing so it can retain the existing channel and enable the construction of the required transport facilities on top of the deck surface. This decked structure continues to meet the current stormwater drainage design standard and can help ameliorate the odour problem brought about by the existing open nullah.

Covered footbridge link to the Wong Chuk Hang industrial area

5. The covered footbridge provides a direct, safe and convenient connection between Wong Chuk Hang Station and the adjacent industrial area. Lifts have been installed at all the landing areas of the footbridge to provide barrier-free access.

Covered footbridge link to Ap Lei Chau Estate

6. One of the entrances of South Horizons Station is located at Yi Nam Road, south of Ap Lei Chau Bridge Road. Ap Lei Chau Estate is located on an elevated platform at about seven metres above Yi Nam Road, to the north of Ap Lei Chau Bridge Road. Without the footbridge, the residents of Ap Lei Chau Estate will have to make a detour of about 300 metres to the at-grade crossing near the junction of Ap Lei Chau Bridge Road and Yi Nam Road in order to reach South Horizons Station. This will cause great inconvenience to the residents of Ap Lei Chau Estate, in particular the elderly and the physically disabled.

7. The footbridge provides a direct, safe and convenient connection between Ap Lei Chau Estate and the entrance of South Horizons Station at Yi Nam Road. A lift has been installed at the footbridge to provide a barrier-free access.

/ Pedestrian

Pedestrian link to Aberdeen Channel Promenade

8. In response to the strong request of the residents of the Southern District, the Tourism Commission carried out beautification works to enhance Aberdeen Channel Promenade, as part of the overall beautification of the Aberdeen area. To facilitate access to the Promenade, we have constructed a pedestrian link to provide a direct access from Wong Chuk Hang Station to the Promenade.

9. In addition to the footbridge across Wong Chuk Hang Nullah, the pedestrian link also includes other facilities, such as a lookout point at the Promenade waterfront, an open space of about 1 140 m², and landscaping works underneath Ap Lei Chau Bridge Road. These facilities are provided in response to the requests of the Southern District Council.

Junction improvement at Ap Lei Chau Drive and Ap Lei Chau Bridge Road

10. During the construction of the SIL(E), the road junction of Ap Lei Chau Drive and Ap Lei Chau Bridge Road was closed off temporarily to facilitate the excavation works for the tunnel of the SIL(E). After the completion of the excavation works, widening and improvement works were undertaken at the road junction. The junction improvement enables the road junction to cope with the anticipated traffic growth due to future residential development at Ap Lei Chau Praya Road.