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Panel on Transport

Subcommittee on Matters Relating to Railways
Meeting on 24 May 2013

Background brief on railway safety

Purpose

This paper provides background information on railway safety, including both heavy rail and light rail. It also summarises major views and concerns expressed by Members of the Legislative Council ("LegCo") and members of the Subcommittee on Matters Relating to Railways ("the Subcommittee") about railway safety, and the measures taken by the Administration and the MTR Corporation Limited ("MTRCL") to ensure passenger safety.

Background

2. Both the Administration and MTRCL are accountable for ensuring railway safety. Their roles are described in the following paragraphs.

Role of the Administration

3. The Administration requires MTRCL to provide safe and reliable railway services at all times. The Transport and Housing Bureau is responsible for overseeing the overall policy on monitoring railway safety and regulating railway services. The Transport Department ("TD") and the Electrical and Mechanical Services Department ("EMSD") are responsible for monitoring the service and safety performance aspects of railway services provided by MTRCL respectively.

4. TD is responsible for monitoring the service performance of the various railway lines of MTRCL. In this regard, MTRCL is required to

comply with the service standards stipulated by the Administration. There are currently three major criteria for measuring railway service performance, namely, train service delivery (i.e. actual train trips), train punctuality (i.e. the percentage of trains completing their journeys on time) and passenger journeys on time (i.e. the percentage of the total number of passengers arriving at their destinations on time and without experiencing a delay of more than 5 minutes). These service standards are commonly adopted internationally. Other performance indicators include reliability of add value machine and ticket issuing machine, reliability of ticket gate, reliability of escalator and reliability of passenger lift. TD oversees whether MTRCL meets the requirements of the above service standards by examining the returns regularly submitted by MTRCL on its service performance, and investigates complaints received about railway service in order to monitor railway services. If MTRCL fails to meet any requirement, TD will require MTRCL to take remedial measures immediately.

5. EMSD monitors the safety of the railway systems and ensures that MTRCL has met all safety requirements in the design, construction, operation and maintenance of the railway systems. It is the responsibility of MTRCL to demonstrate to the satisfaction of EMSD that its railway systems are safe for use and their design standards are not only in line with industry standards internationally, but also appropriate for the situation in Hong Kong. MTRCL conducts risk assessment in their design process to reduce the risk factor. Currently, the design standards and safety management system of MTRCL is compatible with international standards. EMSD also monitors the safety of operating railways including conducting inspections of the railway systems to ensure that they are operating well; investigation of railway incidents as well as assessment and following up on the improvement measures adopted by MTRCL.

6. In case of railway incidents, TD and EMSD will follow up and request for an incident report from MTRCL. They will conduct investigations, provide advice to MTRCL on the preliminary identification of the cause of the incident and the immediate actions required. TD and EMSD will monitor the progress made by MTRCL in identifying the cause and implementing improvement measures.

7. The Buildings Department is responsible for the monitoring of the buildings and building works managed by MTRCL, including the viaduct piers along the West Rail Line. MTRCL is required to regularly inspect and maintain its buildings and building works to ensure railway safety.

Role of MTRCL

8. MTRCL has legal obligation to ensure passenger safety. In accordance with section 16(1)(a)(iii) of the Mass Transit Railway ("MTR") Ordinance (Cap. 556), MTRCL is in default under the franchise if there has been a substantial failure by MTRCL to discharge an obligation under the Service Concession Agreement which does not amount to a major breach of the Service Concession Agreement, and the failure (or likely failure) results in or is likely to result in a substantial breakdown of the service; the safety of persons travelling on the railway or being on the railway premises being endangered in a manner likely to result in serious injury to those persons; or serious injury to or the death of persons travelling on the railway or being on the railway premises. MTRCL should, therefore, accord top priority to safety in railway operations.

9. Information on accidents involving injuries or fatalities of passengers from 2008 to 2010 as provided by MTRCL is set out in **Appendix I**.

Major concerns over safety of heavy rail

10. Members have discussed railway safety in the Subcommittee and raised Council questions in the Fourth and Fifth LegCos. Members' major concerns over safety of heavy rail and the Light Rail and the measures taken by the Administration and MTRCL are summarised in the ensuing paragraphs.

Escalator and lift safety

11. Members have expressed concern over the safety of escalators which were produced by a manufacturer in Mainland China; similar products of which were believed to have caused a number of accidents in China.

Measures taken by the Administration and MTRCL

12. According to the Administration, as at March 2012, there were 979 escalators and 207 passenger lifts in the MTR network to facilitate passengers' travelling between ground level, concourse level and platform level.

13. MTRCL has advised that it has from 2009 to 2011, there were around 700 incidents involving escalators and passenger lifts in the MTR network per annum. The majority of the incidents were caused by

passengers who lost their balance and fell, did not hold the handrail, stood close to the step edge, or walked on the escalators, etc. MTRCL has imposed policies and procedures to ensure that the maintenance contractors of the lifts and escalators carry out their works regularly. The contracts between MTRCL and the maintenance contractors also require that necessary performance levels of maintenance works be met. To ensure the machinery and associated equipment are in a safe working order and fulfil relevant requirements of the Lifts and Escalators (Safety) Ordinance (Cap. 327), for all escalators, the contractor shall carry out a regular maintenance service every two weeks, and a thorough examination and testing every six months. For all passenger lifts, the contractor shall carry out a regular maintenance service every two weeks, a thorough examination every twelve months, and an on-load testing every five years.

Train door safety

14. At the meeting on 13 January 2012, members of the Subcommittee raised concern over the incidents involving station-skipping and failures of trains to stop at proper position for alighting or boarding. Upon the Subcommittee's request, MTRCL provided a paper to explain its safety measures in February 2012.

Measures taken by the Administration and MTRCL

15. According to MTRCL, the MTR system is designed to be fail-safe. MTR train doors, platform screen doors (PSDs) and automatic platform gates (APGs) have been designed in such a way that under normal train operations, they cannot be normally opened if the train is in motion or not stopped at the pre-designated stopping position at platforms, such that passengers who board and alight at stations can be safeguarded. Also, Train Captains are properly trained and assessed as competent to operate trains before they are assigned with the duties.

16. In order to strengthen passenger safety awareness, since July 2010, during peak hours at MTR interchange stations, platform assistants will hold up the "Stop" sign and activate the electronic whistle when train doors are about to close, in order to urge passengers not to attempt entering train compartments when train doors are closing.

Platform safety

17. From 2008 to 2011, Members raised nine Council questions and passed a number of motions at meetings of the Subcommittee to express concerns over platform safety of heavy rail. Members mainly urged the Administration to solve problems of wide platform gaps at MTR stations

and to retrofit PSDs or APGs in order to prevent the recurrence of accidents of passengers falling onto rail tracks at those stations which had not yet installed PSDs or APGs.

Measures taken by the Administration and MTRCL

18. According to the Administration, the design of the existing station platforms in the railway system is safe. At locations where the gap between the platform and the train is relatively wide, MTRCL has already taken measures, including installing platform gap fillers to narrow the gap and making public announcements on platforms and in train compartments in Cantonese, Putonghua and English to remind passengers to mind the platform gaps. MTRCL also conducts education activities from time to time to raise the safety awareness of the public.

19. MTRCL completed retrofitting APGs at eight at-grade and above-ground stations, namely Kwai Fong, Kwai Hing, Tsuen Wan, Kowloon Bay, Ngau Tau Kok, Kwun Tong, Chai Wan and Heng Fa Chuen Stations in 2011. With the completion of this project, out of the existing 84 MTR stations, 62 stations are installed with PSDs or APGs, other than the 22 stations along the East Rail Line and Ma On Shan Line.

20. According to MTRCL's technical studies, retrofitting APGs at East Rail Line stations have to be considered from the perspectives of passenger safety, reliability of train operation and maintenance of service levels etc. As MTRCL has proposed that the signalling system and trains of East Rail Line have to be replaced to permit the operation of the North-South Line under SCL project, MTRCL is of the view that the retrofitting of APGs at East Rail Line stations in tandem with the SCL project would achieve synergy, as well as reduction in abortive works and adverse impact on passengers.

21. In parallel to studying the retrofitting of APGs at East Rail Line, MTRCL also examined the feasibility of retrofitting APGs at Ma On Shan Line. When SCL comes into operation, Ma On Shan Line would change to allow operation of 8-car trains, in place of 4-car trains at present. Suitable platform modification would be necessary. In order to achieve synergy and minimise the inconvenience to passengers, MTRCL would consider retrofitting APGs at Ma On Shan Line stations in tandem with the East-West Line of SCL.

Rail maintenance

22. Members of the Subcommittee expressed grave concern about the rail breakage incidents from 1 January 2008 to 10 February 2011 and urged

MTRCL to tighten up procedures for rail procurement and maintenance. The Subcommittee also requested the Administration to strengthen monitoring of MTRCL in its rail maintenance works.

Measures taken by the Administration and MTRCL

23. According to the Administration, EMSD regularly conducts inspections and checks to validate if MTRCL has followed their scheduled railway system maintenance works as planned to ensure railway safety. In addition, MTRCL has to notify EMSD of incidents involving railway safety in accordance with the established mechanism and to submit investigation reports. For railway safety incidents, EMSD has to scrutinise and reviews MTRCL's investigation reports with a view to ascertaining the causes, and monitors whether the incidents have become a trend. Due to the rail breakage incidents in early 2011, the Administration has asked MTRCL to review its railway system maintenance, and to implement appropriate measures to ensure safety of the railway system.

Major concerns over safety of Light Rail

24. Members have raised concern over safety measures at Light Rail platforms, many of which are only partly covered, causing inconvenience to passengers who have to wait for trains during rainy days when they often crowded together under the covered parts, and hence accidents were prone to occur.

25. On 1 June 2011, there was a serious incident in which a Light Rail train collided with a vehicle on the road and was derailed, resulting in over 20 people being injured. The Subcommittee had thus enquired about the Administration's improvement measures to enhance traffic safety of the Light Rail.

Measures taken by the Administration and MTRCL

26. According to the Administration, safety facilities at road junctions in the Light Rail system include traffic lights, road signs on Light Rail reserved area; road signs on vehicle height restrictions; yellow box marking to remind drivers not to stay within the yellow box; and before entering a road junction, Light Rail vehicles will sound a "Ding Ding" bell, and when there is an emergency, the train captain will sound the horn to alert other drivers. Safety facilities at Light Rail pedestrian crossings include signs of "Stop, Look Around" and "Attention to Light Rail"; words of "Look Left" and "Look Right" painted on the ground to remind pedestrians to pay attention to traffic before stepping beyond the yellow line; and before

entering a pedestrian crossing, Light Rail vehicles will sound a "Ding Ding" bell to alert pedestrians.

27. Besides, all Light Rail platforms have tactile guide paths of full platform length and these tactile guide paths would lead visually impaired passengers to await trains at the position of the first door of the first train compartment. In addition, yellow tactile lines are installed at all Light Rail platforms to remind visually impaired passengers that they are close to the front edge of the platform. MTRCL has also enhanced its public announcement at Light Rail platforms to remind passengers to stand behind the yellow lines and to beware of the platform gap. Plastic fillers are installed at the edge of platforms at 37 Light Rail stations with wide platform gaps to narrow the gap.

28. Trains are required to operate at low speed when entering and leaving stations. Train drivers would stay alert to monitor traffic at crossings and the situation of passengers awaiting trains at platforms and be ready to take necessary action if the need arises. To facilitate visually impaired passengers, when a Light Rail train arrives at stations and train doors open, in-train announcement on route number and destination of the train will be broadcast. Before train doors close, a buzzing sound together with in-train announcement will be made to remind passengers that train doors are about to close and to stay away from the train doors.

29. There are platform shelters at all Light Rail platforms. The length of the shelter is determined having regard to the patronage and the utilisation of platforms. At present, there are 68 Light Rail stops with 159 platforms over 80% of which, i.e. 132 platforms, have shelters that can fully cover or almost fully cover the entire platform. The shelters at the remaining 27 platforms can cover almost half of the platform. The 27 platforms are at 18 stops where the patronage at the 18 stops mentioned is relatively low, during peak hours, the average number of passengers waiting at any one time at each of the 18 stations is less than 20, which is much lower than the average number of 100 passengers waiting at other Light Rail stations.

Latest development

30. On 17 May 2013, more than 70 passengers were injured when a Light Rail train was derailed in Tin Shui Wai, Yuen Long. The Transport and Housing Bureau undertook to report on the case to the Subcommittee on 24 May 2013.

Relevant papers

31. A list of relevant papers is at **Appendix II**.

Council Business Division 1
Legislative Council Secretariat
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**Information on accidents involving injuries or fatalities of passengers
as provided by MTRCL from 2008 to 2010**

Railway equipment involved in the accident	2008			2009			2010		
	No. of accidents	No. of injuries	No. of fatalities	No. of accidents	No. of injuries	No. of fatalities	No. of accidents	No. of injuries	No. of fatalities
Escalator / Travelator	706	778	0	721	788	0	725	785	0
Train Door	254	273	0	236	248	0	259	272	0
Platform Gap	143	143	0	133	133	0	159	159	0
Platform Screen Door / Automatic Platform Gate	38	38	0	46	48	0	44	46	0
Lift	8	8	0	9	9	0	12	12	0
Miscellaneous	87	109	2	69	84	3	92	115	1
Total	1236	1349	2	1214	1310	3	1291	1389	1

The above figures exclude cases of suicide / attempted suicide, accidents due to passengers' own sickness & trespassing. "Miscellaneous" refers to accidents including cases of passengers or members of the public tripping or falling as a result of losing balance and Light Rail accidents involving pedestrians or vehicles on the road.

Appendix II

Background brief on railway safety

List of relevant papers

Date of meeting	Meeting	Paper
2008.01.23	Council Meeting	Question No. 2 – Safety measures at Light Rail platforms http://www.info.gov.hk/gia/general/200801/23/P200801230161.htm
2008.07.02	Council Meeting	Question No. 1 – Installation of automatic platform gates at MTR stations http://www.info.gov.hk/gia/general/200807/02/P200807020245.htm
2009.01.16	Subcommittee on Matters Relating to Railways	Minutes (LC Paper No. CB(1) 1146 /08-09) http://www.legco.gov.hk/yr08-09/english/panels/tp/tp_rdp/minutes/rdp20090116.pdf
2009.03.18	Council Meeting	Question No. 4 – Retrofitting of automatic platform gates http://www.info.gov.hk/gia/general/200903/18/P200903180135.htm
2009.06.17	Council Meeting	Question No. 8 – Shelters at Light Rail platforms http://www.info.gov.hk/gia/general/200906/17/P200906170115.htm
2009.12.02	Council Meeting	Question No. 9 – Measures to solve the problem of wide platform gaps at MTR stations http://www.info.gov.hk/gia/general/200912/02/P200912020188.htm
2010.03.17	Council Meeting	Question No. 6 – Platform screen doors and automatic platform gates in MTR stations http://www.info.gov.hk/gia/general/201003/17/P201003170192.htm
2010.06.09	Council Meeting	Question No. 6 – MTR fares and station facilities http://www.info.gov.hk/gia/general/201006/09/P201006090142.htm

Date of meeting	Meeting	Paper
2010.11.03	Council Meeting	Question No. 14 – Retrofitting of Platform Screen Doors and Automatic Platform Gates at MTR stations http://www.info.gov.hk/gia/general/201011/03/P201011030135.htm
2011.01.19	Council Meeting	Question No. 18 – MTR facilities and services http://www.info.gov.hk/gia/general/201101/19/P201101190133.htm
2011.01.21	Subcommittee on Matters Relating to Railways	Agenda (IV) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/agenda/rdp20110121.htm
2011.02.21	Subcommittee on Matters Relating to Railways	Agenda (I) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/agenda/rdp20110221.htm Minutes (LC Paper No. CB(1)3029 /10-11) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20110221.pdf
2011.03.02	Council Meeting	Question No. 15 – Platform safety of MTR stations http://www.info.gov.hk/gia/general/201103/02/P201103020118.htm
2011.03.09	Council Meeting	Question No. 12 – Railway safety http://www.info.gov.hk/gia/general/201103/09/P201103090115.htm
2011.03.18	Subcommittee on Matters Relating to Railways	Minutes (LC Paper No. CB(1)2913/10-11) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20110318.pdf
2011.04.06	Council Meeting	Question No. 9 - Retrofitting platform screen doors or automatic platform gates at MTR stations http://www.info.gov.hk/gia/general/201104/06/P201104060139.htm

Date of meeting	Meeting	Paper
2011.06.01	Council Meeting	Question No. 14 – Traffic safety of Light Rail http://www.info.gov.hk/gia/general/201106/01/P201105310251.htm
2011.07.13	Council Meeting	Question No. 1 – Escalator incidents http://www.info.gov.hk/gia/general/201107/13/P201107130223.htm Question No. 10 – Safety of lifts and escalators in railway premises http://www.info.gov.hk/gia/general/201203/28/P201203270466.htm
2012.01.13	Subcommittee on Matters Relating to Railways	Agenda (IV) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/agenda/rdp20120113.htm Minutes (LC Paper No. CB(1)2461/11-12) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/minutes/rdp20120113.pdf
2012.02.15	Council Meeting	Question No. 8 – Nuisance behaviour in MTR train compartments http://www.info.gov.hk/gia/general/201202/15/P201202150171.htm
2012.02.22	Council Meeting	Question No. 11 – Acts of contravention in the railway premises http://www.info.gov.hk/gia/general/201202/22/P201202220190.htm
2012.03.02	Subcommittee on Matters Relating to Railways	Agenda (Item IV) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/agenda/rdp20120302.htm
2012.06.28	Subcommittee on Matters Relating to Railways	Agenda (Item I) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/agenda/rdp20120628.htm

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