

**Legislative Council Panel on Transport  
Subcommittee on Matters Relating to Railways**

**Design of Next Generation of Railway Stations  
and Update on Retrofitting Platform Screen Doors**

**Introduction**

The MTR Corporation Limited (MTRCL) is committed to bringing constant improvements to the design of its railway stations with a view to updating their equipment and facilities, and providing better experience and services to passengers. To meet the needs and changes of the society, including changes in the age structure of the Hong Kong population, increase in the number of long distance rail passengers, needs of persons with disabilities and passenger aspirations, the MTRCL will introduce new facilities and designs to the next generation of railway stations. This paper aims to brief members on the design of the next generation of railway stations as well as the progress of retrofitting automatic platform gates (APGs) in existing railway stations.

**Design concepts of next generation of railway stations**

2. The development of the railway network in Hong Kong is entering a new era, as a number of railway projects are being implemented, including the cross-boundary Guangzhou-Shenzhen-Hong Kong Express Rail Link (Hong Kong Section), the local West Island Line, the South Island Line (East), the Kwun Tong Line Extension and the Shatin to Central Link (SCL). Upon the completion of these railway lines in the coming 10 years, some districts currently without railway service like the Western District, the Southern District, Whampao, To Kwa Wan, Kowloon City and the new development area in Kai Tak, etc. will be covered by the railway network, after which the Hong Kong railway network will be more complete.

3. Taking advantage of this opportunity, the MTRCL will launch in stations of these new railway lines new facilities and designs that will not only bring a refreshing look, but will also provide passengers with greater convenience and better services, and therefore better experience.

4. In early years, MTR railway stations were designed to cater for the primary function of addressing the travel need of passengers. As railway plays a more significant role in Hong Kong's public transport service, MTR stations have become a part of people's daily living. Future MTR stations will see greater emphasis on human-centred designs. The design concepts of the next generation of railway stations are discussed as follows.

#### Architectural aspect

5. Railway stations are part of the urban landscape. The architectural design of future MTR stations will place more emphasis on the integration with the surrounding environment and urban context wherever possible. Greening features, such as vertical greening and green roof, will be adopted for the external structures of new MTR stations, where appropriate, to blend in with the environment.

6. All the station components will be re-designed to become part of the station architecture and to give a more coherent, tidier and more sophisticated appearance to the overall station environment. For instance, the new ticket machines and ticket gates, while serving their practical functions, will adopt a more sophisticated look in place of the traditional stainless steel casings commonly adopted internationally.

#### Cultural aspect

7. The MTRCL will continue to incorporate arts elements into new stations and make use of MTR stations with high passenger flow to promote community art that can enable the general public and tourists to better understand local history and culture, as well as provide a more comfortable and attractive travelling environment for passengers. The "art in mtr" initiative will be continued with a long-term goal of installing one unique, permanent art piece at each MTR station for the enjoyment of the public.

#### Community aspect

8. The MTRCL, through public participation, has successfully incorporated local culture into the design of station facilities. For example, "community art galleries", which allow the display of paintings and drawings by students from schools or artists from non-profit making groups, can be found in a number of stations throughout the railway network. In future, local communities will be involved in the station art programmes as far as possible to enhance the connection between the stations and the communities, as well as incorporate local culture and characteristics into the stations.

## Functional aspect

9. The functions of the next generation of railway stations will become more diversified. While effective accesses and facilities will be maintained in new stations to allow large numbers of passengers to travel between the street, concourse and platform levels speedily and efficiently, station accessibility facilities, such as passenger lifts, will also be strengthened to facilitate the use of the railway service by passengers with different needs. Equipment in new stations like the ticket machines will be re-designed for easier operation and cater for the needs of different passengers.

10. Based on the above design concepts, the MTRCL will roll out a series of new facilities and designs in stations of new railway projects:

(a) To cater for the needs of persons with disabilities or special needs, there will be at least one barrier-free access, for example, equipped with a passenger lift or a ramp, in each new railway station to help passengers in need enter or leave a station conveniently.

(b) Tactile guide paths and tactile station layout maps with audible device will be provided in all new stations. Escalator audible warning signals will be installed in all stations to serve the needs of passengers with impaired vision.

(c) In view of passenger needs and expansion of railway network, a new set of user-friendly ticket machines with added functions will be adopted in new railway stations to provide passengers with greater convenience. Details are shown in Appendix 1.

(d) In view of the increased average passenger journey time as a result of the expanding railway network in Hong Kong, public toilets will be provided for new stations for the convenience of the travelling public.

(e) To enhance the safety of passengers at platform, platform screen doors or APGs will be provided in new stations.

(f) In anticipation of the increase in the average age of passengers and to meet the needs of visually impaired passengers, the height of the hanging signs in MTR stations will be increased to allow better legibility of the sign messages.

(g) LCD monitors will be installed in the concourses and platforms of new MTR stations. The new passenger information displays will provide a larger screen for information display and allow greater flexibility in the provision of useful passenger information, such as time, weather, time till next train, service disruption information and operational promotion videos, etc.

(h) Environmentally-friendly designs will be introduced to the new generation of railway stations to achieve higher energy efficiency. Details are shown in Appendix 2.

### **Latest update on retrofitting APGs in existing railway stations**

11. The programme to retrofit APGs at the 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, was completed at the end of 2011, one year ahead of the original plan. Although retrofitting APGs at the eight stations was technically challenging as any slight shift of the gates' alignment would trigger the fail-safe mechanism to stop trains from automatically entering or departing a station, the operation of the APGs at the aforementioned eight stations has by and large been smooth since completion of the project. With the completion of this project, out of the existing 84 MTR stations (including the Island Line, Tsuen Wan Line, Kwun Tong Line, Tung Chung Line, Tseung Kwan O Line, Disneyland Resort Line, Airport Express, East Rail Line, West Rail Line and Ma On Shan Line), other than the 22 stations along the East Rail Line and Ma On Shan Line, the rest of the 62 stations are installed with platform screen doors or APGs.

12. Other than APGs, MTRCL has in place various safety facilities and measures to ensure the safety of passengers on platforms. They include:

- (a) installation of platform gap fillers to narrow the gap between the train and the platform;
- (b) installation of yellow tactile strips along platform edges to remind passengers not to stand beyond the yellow line;
- (c) broadcasting door chimes before train doors close to remind passengers not to charge into the compartments;
- (d) installation of CCTV system at platforms for monitoring purpose and making public announcements on platforms and in train compartments to remind passengers to mind the platform gaps;
- (e) installation of illumination under the platforms and flashing lights at the edge of East Rail Line platforms at locations where the gap between the platform and the train is relatively wide so that passengers would pay attention to the gap; and

- (f) introduction of a new measure in 2010 whereby Station Assistants are deployed on platforms of selected stations to help ensure passenger safety by raising a “Stop” sign and activating an electronic whistle to urge passengers not to rush onto train while the train doors are closing.

13. Regarding the retrofitting of APGs along the East Rail Line, MTRCL submitted an information paper (LC Paper no. CB(1)1072/10-11(02)) to the Subcommittee on Matters Relating to Railways (the Subcommittee) under the Legislative Council Panel on Transport and presented the results and conclusions of the technical studies at the meeting of 21 January 2011.

14. The studies reveal that retrofitting APGs at East Rail Line stations poses particularly difficult challenges. They include:

- (a) safety risk associated with wide platform gaps;
- (b) limitations of existing signalling system;
- (c) limitations of existing trains; and
- (d) limitations of platform structures.

15. To ensure safe and reliable train operations, the limitations of the existing signalling system, existing trains and platform structures need to be overcome whether the retrofitting of APGs along the East Rail Line is carried out as a standalone project or at straight East Rail Line platforms first. The time required to complete the project is similar to that of retrofitting the APGs in tandem with the SCL project.

16. Taking all factors into account, MTRCL is of the view that the logical solution is to combine the work of the SCL project and the retrofitting of APGs along the East Rail Line because the wide platform gap issue at curved platforms could be resolved and the new signalling system, new trains and the required platform modification works could all be carried out at the same time when the SCL project’s North-South Corridor is constructed. It is expected that the APGs along the East Rail Line will be operational by the time the North-South Corridor of the SCL is completed in 2020.

17. Since the Subcommittee meeting on 21 January 2011, arrangements to prepare for APG retrofitting works along the East Rail Line in tandem with the SCL project have commenced. The MTRCL has awarded a contract to conduct ground investigation on East Rail Line platforms. Physical investigations are being carried out at East Rail Line stations to determine the detailed modifications required to strengthen the platform structure to support safe APG operation.

18. In parallel with the study on retrofitting APGs along the East Rail Line, MTRCL also examined the feasibility of retrofitting APGs along the Ma On Shan Line. The Ma On Shan Line is currently using 4-car trains. When the SCL comes into operation, it would be changed to allow operation of 8-car trains. Appropriate platform modifications would be necessary. Both retrofitting APGs and the construction of the East-West Corridor of the SCL will involve modifications of Ma On Shan Line platforms. If the retrofitting of APGs along the Ma On Shan Line is carried out as a standalone project, some of the APGs installed might need to be dismantled when construction of the SCL begins, in order to reinstall APGs that fit for the operation of 8-car trains, resulting in wastage. In order to minimise inconvenience and disturbance to passengers due to repeated works on the platforms, reduce waste and achieve synergy, MTRCL would carry out the APG retrofitting works on Ma On Shan Line stations in tandem with the construction of the East-West Corridor of the SCL project scheduled for completion by 2018. When the East-West Corridor of the SCL is completed and commences service, it is envisaged that the APGs will be operational at the same time.

## **Conclusion**

19. To cope with the development of Hong Kong society and the change in the travelling pattern of passengers, the MTRCL will continue to implement new design and provide new facilities in the next generation of railway stations with a view to upgrading passenger facilities as well as service levels to meet community needs.

20. Regarding retrofitting APGs on existing railway stations, currently all MTR stations are equipped with platform screen doors or APGs except those of the East Rail Line and Ma On Shan Line. The logical solution is to combine the works of the SCL project and the retrofitting of APGs along the East Rail Line. Arrangements to prepare for APG retrofitting works in tandem with the SCL project have commenced.

**Newly Designed Ticketing Facilities**

A new set of user-friendly ticket machines with added functions will be adopted in new railway stations to provide passengers with greater convenience:

(a) Ticket Machine

The new Ticket Machine (TM) has been designed to combine the basic functions of the existing Single Journey Ticket Issuing Machine and Add Value Machine. Passengers will be able to use the same machine to purchase tickets or add value to their Octopus Cards. The new TM will also allow the payment of single journey tickets by cash or Octopus cards. The customer interface of the TM will be re-designed to ensure the transaction flow is smoother and more logical. The TM will have a much larger touch-screen display, where the location of the displayed information can be set to correspond to people of different height. There will also be adequate leg room to allow wheelchair users to operate the TM easily. The TM will be equipped with light indicators, braille plates, vocal instructions, induction loop and intercom to enhance its accessibility to all passengers.

(b) Card Enquiry Machine

The new Card Enquiry Machine, in place of the existing Multi-Processor, will not only allow passengers to check the transaction records of their Octopus Cards, but will also have added functions to support enquiry about the MTR Club bonus points as well as the printing of transaction records.

(c) Ticket Gate

Newly designed ticket gates, with a bigger screen displaying transaction information and an audible device capable of releasing vocal messages on the amount of value deducted and the remaining value of the Octopus Cards, will be adopted in new stations. Additional light indicators and vocal messages will be employed to inform passengers with impaired vision of the gate status.

### **Environmentally-friendly Designs**

The MTRCL is constantly exploring ideas and technologies to make the MTR system even more energy-efficient and environmentally-friendly. The following green designs will be introduced to the next generation of railway stations:

- (a) **High-efficiency lighting system**  
A high-efficiency lighting system will be adopted in all new stations. The station lighting control system will also be improved to achieve energy saving. The MTRCL is currently conducting various trials on the application and durability of LED lighting with the aim of further reducing energy consumption.
- (b) **High-efficiency air-conditioning system**  
A fresh water-cooled type air-conditioning system, in place of the air-cooled type, will be installed in all possible areas of new MTR stations to save air-conditioning energy consumption.
- (c) **Utilisation of regenerated energy**  
The MTRCL is exploring ways to utilise energy regenerated in the electrical and mechanical systems, for example, energy regenerated by the downward movements of lifts and escalators. Devices will be provided in the lifts and escalators of new stations to achieve this objective.
- (d) **Natural light**  
Natural light will be used in stations wherever possible.