

Legislative Council Panel on Transport
Subcommittee on matters relating to railways

Study on the open fare system for Light Rail

Purpose

At the Legislative Council Panel on Transport Subcommittee on matters relating to railways held on 6 May 2005, Members passed the following motion-

“That this Subcommittee requests the Kowloon-Canton Railway Corporation (KCRC) to study and improve the open fare system for Light Rail in order to reduce passengers’ psychological pressure.”

This paper informs Members about the outcome of the study carried out by KCRC in response to the above motion.

Scope of Study

2. The study covered the following areas:
 - A focus group was organised to study passengers’ perceptions of the open fare system, the causes of any possible pressure brought by the system, and the improvement measures
 - The feasibility of installing flap gates on Light Rail platforms
 - The feasibility of installing Octopus processors inside Light Rail Vehicles (LRVs)
 - The feasibility of deploying a ticket conductor on every LRV or platform
 - Measures to strengthen communications with passengers.

3. The outcome of the study is set out in the ensuing paragraphs.

Focus Group

4. A focus group made up of Light Rail passengers of different age groups and background was organised on 24 June 2005 for a special meeting to study passengers’ perceptions of the Light Rail open fare system.

5. To ensure the neutrality of the focus group, KCRC invited the Baptist University to act as facilitators of the meeting. The facilitators collected passengers' views in a comprehensive and fair manner and analysed the views thoroughly.

6. The Baptist University facilitators led the focus group in thorough discussions on various aspects of the Light Rail open fare system, in which members were encouraged to offer their suggestions. The discussion topics included the convenience of the system, fare-charging mechanisms, surcharge arrangements, ticket inspection procedures, possible psychological pressure when riding on Light Rail, and possible improvement measures including the installation of Octopus Card processors on-board Light Rail, and installation of flap gates on Light Rail platforms, and measures to strengthen publicity and education. (A summary of the discussion is set out at Annex 1)

Simulated Installation of Flap Gates on Light Rail Platforms

7. On 30 June 2005, a simulation was conducted to evaluate the feasibility and impact of the installation of flap gates on Light Rail platforms of different widths. The simulation was conducted at 4 Light Rail stops: Yuen Long Terminus, Tai Tong Road Stop, Tin Wing Stop and Tin Yat Stop.

8. There are 68 Light Rail stops. The majority of stops, except for the main termini such as Tuen Mun Ferry Pier and the 4 interchange stations with West Rail, are located in busy areas. Most Light Rail platforms can be divided into 3 groups according to the different widths: (i) 3 metres or below, (ii) 4 metres and (iii) 5 metres or above.

9. The simulation revealed that only one flap gate (a wide gate enabling access by disabled passengers) could be installed at each end of the platforms of 3 metres or below wide. Two flap gates (including one wide gate enabling handicapped access) can be installed at each end of the platforms of 5 metres wide.

10. All Light Rail platforms are currently accessible from both ends, the installation of a single direction gate will cause inconvenience to passengers and will not be able to meet the demands of passengers. The installation of a gate accessible from both directions, would lead to passenger flow conflicts and create safety problems, especially during peak hours. (Simulation result is at Annex 2)

11. Moreover, the flap gates are accessible for Octopus Card users only. If the gates are installed at both ends of a platform, the single journey ticketing vending machines must be relocated to somewhere outside the platform. As such, the platforms have to be expanded and platform shelters have to be extended.

12. At present, there is no further room for expanding most of the phase 1 Light Rail platforms, such as those stops located along Yuen Long Main Road. Land resumption and occupation of existing traffic lanes will be required for the relocation of facilities and extension works of platform shelters, thereby creating additional loading to road traffic.

13. Because of the operational constraints, geographical limitation and technical problems, it is not feasible to install flap gates on Light Rail platforms.

Simulation on installation of Octopus Card processors on-board Light Rail Vehicles

14. On 25 June 2005, a simulation was conducted at Light Rail Sam Shing Terminus Platform 2. More than 200 passengers boarded and alighted an LRV installed with two Octopus Card processors installed on both sides of each door inside the compartment. More than 10 scenarios of different passengers flow were simulated. (Simulation report is at Annex 3)

15. The Light Rail fleet presently consists of 119 vehicles. A total of 714 Octopus Card processors would be required if two Octopus Card processors were installed on both sides of each door. If passengers were asked to validate their cards after boarding the LRVs, this would increase the boarding time, and the stopping time of vehicles (“dwell time”) by about 15% to 50%, meaning that the existing dwell time of 60 seconds, would be lengthened to 69 to 90 seconds. KCRC now operates 11 Light Rail routes with more than 2900 trips per day. During peak hours, there is a trip every 1.5 minutes on the busiest sections of the system. Moreover, several routes are using the same platforms. Installing Octopus Card processors on-board vehicles would seriously affect both the passenger flow and the train operations. As a result, the overall headway would need to be adjusted and the efficiency of Light Rail would be adversely affected.

16. Light Rail's current fare mechanism operates on a distance basis. Appropriate fares are deducted automatically from passenger's Octopus Cards according to the number of stops (distance) travelled. Passengers who take a shorter journey pay less than those who take a longer journey. If passengers validate their cards on-board LRVs, the ticketing equipment will be unable to identify the boarding or alighting stop of the passengers and thus could not charge the fare according to the distance travelled.

17. Moreover, installing Octopus Card processors on-board LRV cannot ensure that all passengers will validate their cards voluntarily, and the fare evasion rate may increase drastically.

Study on deployment of ticket conductors at Light Rail platforms or on-board LRVs

18. Light Rail has been in operation for more than 19 hours each day. The fleet consists of 119 LRVs. If ticket conductors are to be deployed in each compartment, and to be on duty in three shifts, more than 400 staff will be needed. If a ticket conductor is to be stationed at each platform, more than 500 staff will be required. This will definitely place significant pressure on Light Rail operating costs. (Additional expenses are at Annex 4)

19. Like other public transport systems, during peak hours LRVs are full, a ticket conductor will have great difficulty moving through vehicles to sell tickets. Moreover, the majority of passengers ride Light Rail only for short distance, and in many cases there would not be enough time for them to purchase a ticket from the ticket conductor. On the other hand, if a ticket conductor is to be deployed on each platform, it will be necessary to separate all platforms into paid and unpaid areas in order to identify passengers with or without a valid ticket. Again there would be significant geographical constraints.

Publicity and Education

20. To increase passenger awareness of the need to travel with appropriate tickets, KCRC has initiated a number of publicity and educational activities. Details are as follows:

- The Chairmen of Tuen Mun and Yuen Long Civic Education Committees were invited to officiate a large-scale public education

campaign on 10 July. A number of schools supported and participated in the campaign.

- By-law ambassadors are being deployed to distribute information leaflets on Light Rail platforms.
- Notices have been put up on LRV door windows.
- Posters and banners have been displayed on Light Rail platforms and stickers have been posted in prominent locations in LRVs.
- The font size of notices at platforms and ticketing equipment will be enlarged.
- Educational messages will be disseminated to passengers through regular announcement in LRVs and the display boards.
- Newsletters are published regularly. Seminars and talks are regularly held at schools, community centres, youth centres and elderly centres in the district.

(For details please refer to Annex 5)

Conclusion

21. In response to the motion passed by Members, KCRC has conducted a study examining the feasibility of changing the Light Rail open fare system to a closed system. According to the study, in addition to replacing the ticketing system, extensive civil engineering works would be required. The works would include expanding the platforms located in the midst of existing roads, and modifying platforms at termini. Moreover, extensive land resumption would be required and it might bring about serious impact the community.

22. The design of an open fare system involves less land. By linking platforms directly to pedestrian access or shopping malls adjacent to stops, passengers can use Light Rail more conveniently without passing through the entry/exit gates. As the system is well suited for the geographical environment, it serves the community more cost-effectively. Given the geographical constraints, changing the current open fare system to a closed system would be very difficult. Taking into account all the various factors, KCRC believes that there is no need to change the existing open fare system design.

23. KCRC will adopt as far as possible the suggestions made by the focus group including enhancement of the public announcement and simplifying the Light Rail route map. At the end of this year, KCRC will replace the screen of the Octopus Card processors to provide a better display. If the effect is

satisfactory, KCRC will consider replacing the screens of all the processors.

24. KCRC will continue to closely monitor the operation of the Light Rail open fare system and make reference to the design and the measures adopted by other railways using the open fare system in the well-developed countries. KCRC will also proactively follow up cases where passengers breach the by-laws and provide necessary assistance for them.

Kowloon-Canton Railway Corporation
August 2005

**Open fare system for Light Rail
Focus Group
Members' Views**

Date : 24 June 2005

No. of Participants : 15

Background : Light Rail system served the Northwest New Territories for more than 16 years. Most of the residents are familiar with the open fare system and the travelling pattern of “purchase of ticket before boarding”. However, some passengers consider that the open fare system brings them psychological pressure.

(1) System Design

- 1 Generally, members consider that the residents in the district were familiar with the open fare system of Light Rail, but residents living in other districts who are not frequent travellers might not know the operation well. Some members indicated that although they were familiar with the open system, the fare system was indeed quite complicated.
- 2 Members found that the route map was complicated and suggested improving the characters so as to enable passengers to read them more easily.
- 3 Members opined that the colour of display panels for Octopus processors was too light, the display lights were not bright and the sound was not loud enough. They suggested KCRC to make improvement.
- 4 Members thought that passengers were familiar with validation of Octopus cards for boarding. But, when the LRV was congested, or when passengers were rushing to interchange with West Rail, they would easily forget to validate their Octopus cards. Members suggested KCRC to consider simplifying the process of validation.
- 5 Members suggested KCRC to install passenger information display panels and increase broadcasts on each platform to guide passengers on the route and direction of Light Rail vehicles.

(2) Ticket Inspection Mechanism

- 1 Members held different views on whether fare evasion in Light Rail system was a serious problem.
- 2 All members agreed that there was a need to have a ticket inspection system for Light Rail.
- 3 Members commended the attitude of ticket inspectors of Light Rail. However, there were suggestions that it might cause embarrassment when several ticket inspectors handled a case at the same time.

(3) Technical Feasibility of Installing Additional Ticketing Equipment

- 1 Members opined that it was not feasible to install ticket gates on Light Rail platforms, because the platforms were too narrow and the passenger flow was heavy. This might cause over-congestion and impact on safety.
- 2 Members thought that it was not worthy to consider installing Octopus processors on board the LRV, because the chance of breaching the by-laws would increase. In addition, how to calculate the fares was another important question.
- 3 Some members suggested installing Octopus enquiry machine on board LRV.

(4) Publicity and Public Education

- 1 Members believed that it was important to remind passengers to validate their Octopus cards. Some feasible measures include making announcements and placing 3-dimensional display boards at the entry and exit points of the platforms.
- 2 Some members thought that the publicity activities should be organised in conjunction with other educational campaigns, such as slogan design competition, display board design competition and provision of information on the internet, to enable passengers who live in other districts to know more about the open fare system of Light Rail.

Conclusion

KCRC believes that the cooperation and discipline of passengers is the key to the success of an open fare system. Continuous effort will be made to enhance publicity of the open system and KCRC will accept members' suggestions as far as practicable. It will enhance the public announcement, study the feasibility of simplifying the Light Rail route map, improve the colour and sound effect of the display panels for Octopus processors so as to help passengers understand the open fare system and provide greater convenience for passengers.

Simulation on Installation of Flap Gates on Light Rail Platform

Date : 30 June 2005

(1) Background Information

Venue	Light Rail Yuen Long Terminus, Tai Tong Road Stop, Tin Wing Stop and Tin Yat Stop
Time	10am – 12pm
Type of Flap Gate	The flap gates currently used in West Rail stations and some East Rail stations
Simulation	Simulate passenger flow on Light Rail platforms of different widths

(1) Results of the simulation

Yuen Long Terminus Platform 1 (Platform width : 5m)

Maximum no. of flap gates installed on each ramp

1 flap gate accessible for wheelchairs and 1 flap gate



Tai Tong Road Stop Platform 2 (Platform width : 3m)

Maximum no. of flap gates installed on each ramp

1 flap gate



Tin Wing Stop Platform 2 (Platform width : 5m)

Maximum no. of flap gates installed on each ramp

1 flap gate accessible for wheelchairs and 1 flap gate



Tin Yat Stop Platform 3 (Platform width : 5m)

Maximum no. of flap gates installed on each ramp

1 flap gate accessible for wheelchairs and 1 flap gate



(3) Summary of Existing Light Rail Platforms Widths

Width	No. of Light Rail Platforms
3m or below	17
4m	90
5m or above	52
Total	159

(4) Required works to facilitate installation of flap gates

1. Remove existing Octopus entry/exit processors on Light Rail platforms.
2. Modify single-journey ticket vending machines on all Light Rail platforms to enable them issue magnetic tickets.
3. Relocate single-journey ticket vending machines and Octopus add-value machines near ramps or stairs. Acquisition of additional government lands is required.

4. The maximum throughput of each flap gate is 30 passengers per one minute. This cannot cope with the passenger flow at busy Light Rail stops.

- 5 On the Light Rail platforms of comparatively narrower widths, such as the platforms at Yuen Long Main Road, only one flap gate can be installed on the ramp or stairs of each exit. Passengers will find it very inconvenient if passenger flow is controlled to only one single direction. If bi-direction of passenger flow is adopted, passenger movement will conflict with each other and obstruct passengers boarding and alighting.

**Simulation on installation of Octopus processors
on board Light Rail compartments**

Date : 25 June 2005

Background Information

- | | |
|-------------------------------|--|
| 1. Venue | Light Rail Sam Shing Stop |
| 2. Time | 10am – 1pm |
| 3. Train | Octopus processors installed at both sides next to each door |
| 4. No. of participants | 218
Male:33% ; Female:67%
Age between 12 and around 50 |
| 5. Scenario | 10 different scenarios |

Pros and Cons of installing Octopus processors inside Light Rail compartment

Pros

1. Passengers who fail to validate their Octopus cards on the platform have another chance of paying the fare after boarding the LRV.

Cons

1. If Octopus processors are installed at both sides of the door, passengers will obstruct the doorway for boarding and alighting when validating their Octopus cards.
2. Passengers standing near the Octopus processors will obstruct others to process validation of their Octopus cards.
3. Some passengers may not voluntarily validate their Octopus, thereby increasing fare evasion rate.
4. When the compartment is very congested, passengers standing very close to Octopus processors may mistakenly touch the processors and have the fare value deducted twice.

5. In case of Octopus processors installed on board, it increases the time of boarding and alighting, which increase the dwelling time of Light Rail vehicles at each stop by about 15 to 50%. In addition, during simulation, the processors were set to “\$0 deduction” mode. In real life situation, there will be other ticketing problems such as negative value tickets or invalid tickets. Passengers will take longer time to validate their tickets.





**The Estimated Expenditure on Additional Staffing for
Manual Sale of Tickets**

Additional Staffing	No.	Estimated Expenditure per annum (in million)
Ticket inspection and handling of ticketing issues in Light Rail compartments with Octopus processors. One officer is deployed in each compartment.	432	55
Ticket inspection and handling of ticketing issues on Light Rail platforms with flap gates. One officer is deployed on each platform.	585	75

Publicity Items :

1. From 11 July till the end of August 2005, the message validating the ticket before boarding Light Rail vehicles will be publicised on air and by interactive quiz programme through Commercial Radio 1.
2. Produce posters for display at each Light Rail stop.



3. Put up large banners at Light Rail stops to remind passengers to validate Octopus cards before boarding.



4. Put up banners next to Octopus entry processors to guide passengers.



5. Put up labels on the door glass of each Light Rail vehicle to publicise the message of validating the ticket to residents when Light Rail vehicles run along the tracks.



6. Produce publicity handouts and arrange ambassadors to distribute to passengers at major Light Rail stops.

