

**立法會**  
**Legislative Council**

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**Panel on Transport**

**Subcommittee on Matters Relating to Railways**  
**Meeting on 10 February 2017**

**Background brief on Light Rail service**

**Purpose**

This paper provides background information on Light Rail service. It also summarizes the major views and concerns expressed by Members during previous discussions on this subject.

**Background**

2. Light Rail is a local transportation network which started operation in 1988 to meet the transport needs of the residents in the Northwest New Territories. It now has a route length of about 36.2 kilometres with 68 stops. It carries about 482 600 passenger trips every day in 2015. In addition, the MTR Corporation Limited ("MTRCL") provides feeder bus services to and from many Light Rail stops in the New Territories to facilitate passenger interchange between Light Rail and West Rail Line networks.<sup>1</sup>

Capacity of Light Rail

3. According to the information provided by MTRCL in April 2016<sup>2</sup>,

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<sup>1</sup> The Transport Department's website  
[http://www.td.gov.hk/en/transport\\_in\\_hong\\_kong/public\\_transport/railways/index.html](http://www.td.gov.hk/en/transport_in_hong_kong/public_transport/railways/index.html)

<sup>2</sup> LC Paper No. CB(4)854/15-16(07)

the design capacity of a Light Rail Vehicle ("LRV") is around 240 persons<sup>3</sup>. In practice the maximum number of passengers that are carried by a single-set LRV, as observed during peak hours, is about 200. The passenger density in terms of persons (standing) per square metre ("ppsm") would depend on the number of seats in a LRV. There are currently four generations of LRVs in operation, and vehicles of each generation vary slightly in their design capacity and number of seats. On average, the design capacity of about 240 persons per LRV could in theory be translated into a passenger density of about 8 ppsm, while the maximum capacity of about 200 persons per LRV could be translated into a passenger density of 6 to 7 ppsm<sup>4</sup>. MTRCL uses the maximum carrying capacity as the service standard in arranging LRV service.

### Loading of Light Rail

4. As there are a number of routes passing through a single Light Rail stop, it is not possible to ascertain which route is chosen by passengers after they purchase Light Rail tickets or pay by Octopus. The method of assessing loading of heavy rail is thus not workable to calculate the exact loading of individual Light Rail routes by referring to the entry/exit records of passengers. MTRCL currently assesses the loading of LRVs by on-site observation and surveys. Based on MTRCL's assessment, the overall loading of Light Rail network in the busiest one hour during the morning peak in 2015 is about 80%. The loading of individual routes is at **Appendix I**.

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<sup>3</sup> The design capacity of a LRV is based on the total weight it can safely carry, with reference to the information provided by the manufacturers. Each LRV can safely carry a total weight of around 13 700 kg. Based on this standard, the design capacity of a LRV is 240 persons. It is assumed that each passenger weighs, on average, around 57 kg, which is the assumed average weight of all passengers, children or adults.

<sup>4</sup> The current design capacity of train compartments of the heavy rail is calculated based on accommodating up to 6 ppsm on average. The various components of the existing heavy rail, including the design of railway station structures (such as the concourses and number of exits/entrances), platform size, passageways, and throughput of escalators are designed to sustain the aforementioned designed capacity while maintaining safety. As Light Rail is operating at grade, its infrastructure and station facilities are not as complex as the heavy rail. The carrying capacity of LRVs largely depends on the loading which can be safely carried by the vehicles, instead of, like the heavy rail, being limited by other infrastructure (e.g. station concourse and escalators). Therefore, within the same space, LRVs can carry more passengers than heavy rail trains.

### Additional Light Rail Vehicles

5. MTRCL finished refurbishing a total of 69 Phase I LRVs, thereby increasing the average carrying capacity of Light Rail system by about 8%. Besides, three LRVs were overhauled for progressive resumption of service in 2016 and 2017 to increase the carrying capacity. This will reduce the chances of some passengers failing to board the first arriving LRV during peak hours. MTRCL will flexibly deploy single-set and coupled-set LRVs to serve different routes in order to meet passengers' needs. The number of single-set and coupled-set LRVs of various Light Rail routes in the morning peak in 2015 are at **Appendix II**. Nevertheless, Light Rail has an open design and it shares certain space of the road with other road users. Therefore, when considering whether it is possible to introduce more coupled-set LRVs to individual Light Rail routes, MTRCL should take into account the constraint imposed by the open design of Light Rail on the number of operating LRVs, alongside the patronage.

6. The Administration has commenced the Public Transport Strategy Study ("PTSS"), with a view to conducting a systematic review on the roles and positioning of public transport services other than heavy rail. According to the paper provided by the Administration to the Panel on Transport in November 2014<sup>5</sup>, the long-term development of Light Rail will be reviewed. The topics to be covered include:

- (i) the feasibility of increasing carrying capacity of Light Rail with the original design of the system;
- (ii) the feasibility of upgrading the existing Light Rail system to increase the carrying capacity;
- (iii) the long-term demand of North West New Territories for public transport services; and
- (iv) the roles of various public transport services including Light Rail in meeting such demand.

7. MTRCL is conducting a technical study on topics (i) and (ii) above and will make recommendations on various improvement measures, including the feasibility of procurement of new LRVs. PTSS is expected to be completed by mid-2017 and the findings will be announced.

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<sup>5</sup> LC Paper No. CB(1)238/14-15(06)

Meanwhile, MTRCL has reserved funding for the procurement of 10 LRVs and 10 feeder buses. Suitable contractual arrangements have been made with future suppliers to ensure that the delivery of LRVs and feeder buses to Hong Kong could dovetail with the growth of patronage.

### **Major concerns expressed by the Legislative Council Members**

8. In the Fifth and Sixth Legislative Council, Members have expressed views and concerns on Light Rail service at the Panel on Transport meetings, Subcommittee on Matters Relating to Railways ("the Subcommittee") meetings, special Finance Committee meetings and Council meetings. Their major views and concerns are summarized in the ensuing paragraphs.

#### Crowdedness of Light Rail Vehicles

9. At the Subcommittee meeting on 19 April 2016, members passed a motion on loading of Light Rail. They expressed in the motion that LRVs were seriously overcrowded during morning peak hours and many residents in New Territories West had reflected that they had to wait for two to three LRVs before they could get on board when going to work or school in the morning. When the loading of Light Rail was calculated on the basis that each LRV could carry 200 passengers (equivalent to a passenger density of 6 to 7 ppsm), seven out of the 12 routes had a loading exceeding 80% during morning peak hours with four (505, 507, 614 and 615) among them standing at the level of 90% or above.

10. The Subcommittee thus urged the Administration in the motion to discuss with MTRCL the short-term measures to revise the present calculation basis of the loading of Light Rail from a carrying capacity of 200 passengers per LRV (equivalent to a passenger density of 6 to 7 ppsm) to the common standard adopted by other rails, which was based on a passenger density of 4 ppsm, so as to reflect the actual loading of LRVs. In addition, MTRCL should fully deploy, during the morning peak, coupled-set LRVs to serve routes with a loading (based on a passenger density of 4 ppsm) of 80% or above, so as to alleviate the problem of crowdedness during morning peak hours.

11. MTRCL<sup>6</sup> in May 2016 responded that the positioning of heavy rail and Light Rail and journey distance travelled by their passengers were

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<sup>6</sup> LC Paper No. CB(4)978/15-16(01)

different, it was not appropriate to compare their passenger density directly. Heavy rail mainly provided cross-district transport services for commuters and the journey distance was around 10 kilometres. Light Rail provided feeder service for West Rail Line as well as served as an important public transport mode within the Northwest New Territories, and the journey distance was around two to three kilometres. According to MTRCL, when considering the deployment of coupled-set LRVs, it had to take full account of the actual conditions of individual routes, including patronage, travel patterns of passengers and traffic conditions, etc. with a view to driving resources to those routes or sections most in need. Since March 2015, MTRCL had added 446 trips in total for Light Rail network per week, and deployed more coupled-set LRVs to serve nine Light Rail routes (including 507, 610, 614, 614P, 615, 615P, 705, 751 and 761P), so as to enhance carrying capacity.

#### Future development of Light Rail

12. Noting that the Administration would carry out an in-depth review on the long-term development of Light Rail under PTSS, some members asked about the scope of the review and urged the Administration to consider transforming the current Light Rail system to become an elevated automated people mover system to release road space and reduce traffic accidents. They also asked the Administration to consider scraping Light Rail service and replacing it with underground railway services.

13. The Administration explained that Light Rail, which currently carried nearly half a million passenger trips per day, was taking on dual roles. On one hand, it provided feeder service for West Rail Line. On the other hand, it served as an important public transport mode within the Northwest New Territories. As such, the Administration would not prematurely give up Light Rail. For the time being, the crux of the matter was how the functions of Light Rail could be enhanced. When contemplating the future development of Light Rail, the Administration should, at the same time, review the overall transport infrastructure of the Northwest New Territories in a holistic manner. The Administration was at the moment open to various options with regard to the future development of Light Rail, and the Administration would fully consider the technical and financial feasibility of any proposal, as well as its impact on the transport arrangement of the relevant districts.

### Service disruptions on Light Rail

14. Some Members were worried that the ageing of Light Rail system had caused frequent incidents in recent years. They therefore expressed concern about the numbers of service disruptions of Light Rail and traffic accidents involving Light Rail as well as the resultant casualties. In response, the Administration<sup>7</sup> advised that in 2012, 2013 and 2014, with LRV trips totalling more than 1 million per year, there were 29, 27 and 33 service disruptions of eight minutes or above respectively occurred in Light Rail network. Amongst them, there were two, one and three service disruptions of 31 minutes or above respectively. In 2012, 2013 and 2014, the number of traffic accidents involving Light Rail was 20, 27 and 29 respectively. 12, 21 and 16 cases involved casualties of 73, 105 and 46 respectively. Among the casualties, there were two deaths in two accidents occurred in 2013.

### **Motion passed at the Legislative Council meeting**

15. A motion was passed on 11 December 2013 on "Enhancing the railway service in the Northwest New Territories", urging the Administration to, amongst other things, conduct comprehensive studies and public consultation on the extension of Light Rail line to Tuen Mun Area 54, so as to cope with the demand of the residents in the Northwest New Territories for the railway service. In addition, the Administration should also request MTRCL to expeditiously adopt effective measures to comprehensively improve the existing West Rail and Light Rail services, including reducing fare, increasing service frequencies, increasing and procuring more train cars, improving station facilities, improving the "Monthly Pass Extra" scheme, and enhancing Light Rail system and other connecting transportation arrangements. The wording of the above motion is in **Appendix III**.

### **Latest development**

16. The Administration plans to brief members on the situation of deployment of coupled-set LRVs at the Subcommittee meeting to be held on 10 February 2017.

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<sup>7</sup> <http://www.info.gov.hk/gia/general/201501/28/P201501280459.htm>

**Relevant papers**

17. A list of relevant papers is in **Appendix IV**.

Council Business Division 4  
Legislative Council Secretariat  
7 February 2017

**Loading of individual Light Rail routes in the busiest one hour  
during morning peak hours in 2015**

<b>Route Number</b>	<b>Loading (based on on-site observation and surveys)</b>
505	94%
507	93%
610	88%
614	90%
614P	70%
615	90%
615P	80%
705	69%
706	75%
751	74%
751P	77%
761P	83%
<b>Average</b>	<b>82%</b>

*Source: Annex 3 of LC Paper No. CB(4)854/15-16(07)*



**Number of single-set Light Rail Vehicles and coupled-set Light Rail Vehicles of various Light Rail routes in the morning peak in 2015**

<b>Route Number</b>	<b>Number of single-set Light Rail Vehicles</b>	<b>Number of coupled-set Light Rail Vehicles</b>
505	7	1
507	9	1
610	11	2
614	7	0
614P	5	0
615	7	0
615P	5	0
705	0	5
706	0	5
751	6	6
751P	4	0
761P	0	13
<b>Total</b>	<b>61</b>	<b>33 (Equivalent to 66 single-set Light Rail Vehicles)</b>

Note: In addition to these 127 Light Rail Vehicles, three additional Light Rail Vehicles are flexibly deployed to individual routes to cater for demand in the morning peak. Therefore, the MTR Corporation Limited has been deploying about 130 Light Rail Vehicles on average in the morning peak.

Source: Replies to initial written questions raised by the Finance Committee members in examining the Estimates of Expenditure 2016-2017 (Session No.: 14) (Question Serial No. 1623)

(Translation)

**Motion on  
“Enhancing the railway service in the Northwest New Territories”  
moved by Hon LEUNG Che-cheung  
at the Council meeting of 11 December 2013**

**Motion as amended by Dr Hon KWOK Ka-ki, Ir Dr Hon LO Wai-kwok,  
Hon Frankie YICK, Hon SIN Chung-kai and Hon Albert CHAN**

That, in the consultation document entitled ‘Our Future Railway’ Stage 2 public engagement exercise released in February this year, the Government put forward local railway enhancement schemes such as the Tuen Mun South Extension and the Hung Shui Kiu Station, etc. to integrate into the existing railway network and dovetail with the development plan for the Hung Shui Kiu New Development Area; the population in the Northwest New Territories increases rapidly, and many residents in the district need to work across districts and thus rely heavily on the existing railway and transport link for commuting to and from urban areas; in this connection, this Council urges the Government to, for the purpose of dovetailing with the existing and future development needs and after completing the relevant public consultation, expeditiously implement the planning work for the Tuen Mun South Extension and the Hung Shui Kiu Station, and conduct comprehensive studies and public consultation on the development plans for the Northern Link, the Hong Kong-Shenzhen Western Express Line, the Coastal Railway between Tuen Mun and Tsuen Wan and the extension of the Light Rail line to Tuen Mun Area 54, so as to cope with the demand of the residents in the Northwest New Territories for the railway service; the Government should also request the MTR Corporation Limited to expeditiously adopt effective measures to comprehensively improve the existing West Rail and Light Rail services, including reducing fare, increasing service frequencies, increasing and procuring more train cars, improving station facilities, improving the ‘Monthly Pass Extra’ scheme, and enhancing the Light Rail system and other connecting transportation arrangements, etc.; at the same time, the Government should, by comprehensively considering factors such as Hong Kong’s long-term population development trends, land and housing supplies and overall urban infrastructure planning etc., and based on the findings of the public consultation on ‘Our Future Railway’, expeditiously review and formulate Hong Kong’s long-term railway development blueprint, and implement the planning concerned in a practical and orderly manner, so as to ensure Hong Kong’s sustainable development; the Government should also expeditiously launch the Fourth Comprehensive Transport Study to enable the expansion of railway network to dovetail with the clear positioning of various modes of public transport, so as to provide people with more comprehensive

transport network support; this Council also urges the Government based on the local enhancement schemes mentioned in the 'Our Future Railway' Stage 2 public engagement exercise to construct the North Island Line, Siu Sai Wan Line and South Island Line (West) etc., so as to improve the connection of the Northwest New Territories with other regions; this Council also urges the Government to expeditiously construct a railway between Tuen Mun and Chek Lap Kok, so that every 50 000 to 80 000 people in New Territories West may use one large-scale railway station, thus bringing the ratio of railway stations to population in New Territories West on a par with that in urban areas, and introduce bus interchange services at all large MTR stations and the entrances and exits of major highways, tunnels and flyovers.

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

**List of relevant papers on Light Rail service**

<b>Date of meeting</b>	<b>Meeting</b>	<b>Minutes/Paper</b>	<b>LC Paper No.</b>
17.7.2013	Council meeting	Hon LEUNG Che-cheung raised a question on train services of MTR West Rail Line and Light Rail	<a href="http://www.info.gov.hk/gia/general/201307/17/P201307170208.htm">http://www.info.gov.hk/gia/general/201307/17/P201307170208.htm</a>
23.10.2013	Council meeting	Hon Alice MAK Mei-kuen raised a question on Light Rail fare system	<a href="http://www.info.gov.hk/gia/general/201310/23/P201310220554.htm">http://www.info.gov.hk/gia/general/201310/23/P201310220554.htm</a>
11.12.2013	Council meeting	Motion on "Enhancing the railway service in the Northwest New Territories" moved by Hon LEUNG Che-cheung	<a href="http://www.legco.gov.hk/yr13-14/english/counmtg/motion/cm1211-m2-wordings-e.pdf">http://www.legco.gov.hk/yr13-14/english/counmtg/motion/cm1211-m2-wordings-e.pdf</a>
		Progress Report on motion on "Enhancing the railway service in the Northwest New Territories"	<a href="http://www.legco.gov.hk/yr13-14/english/counmtg/motion/cm1211-m2-prpt-e.pdf">http://www.legco.gov.hk/yr13-14/english/counmtg/motion/cm1211-m2-prpt-e.pdf</a>
28.2.2014	Subcommittee on Matters Relating to Railways	Administration's paper on capacity and loading of MTR trains	CB(1)980/13-14(03) <a href="http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/papers/tp_rdp0228cb1-980-3-e.pdf">http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/papers/tp_rdp0228cb1-980-3-e.pdf</a>
		Minutes	CB(1)1928/13-14 <a href="http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/minutes/rdp20140228.pdf">http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/minutes/rdp20140228.pdf</a>

<b>Date of meeting</b>	<b>Meeting</b>	<b>Minutes/Paper</b>	<b>LC Paper No.</b>
28.5.2014	Council meeting	Hon TAM Yiu-chung raised a question on service hours of Light Rail and MTR buses in New Territories West	<a href="http://www.info.gov.hk/gia/general/201405/28/P201405280428.htm">http://www.info.gov.hk/gia/general/201405/28/P201405280428.htm</a>
25.11.2014	Panel on Transport	Administration's paper on Public Transport Strategy Study — work plan	CB(1)238/14-15(06) <a href="http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20141125cb1-238-6-e.pdf">http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20141125cb1-238-6-e.pdf</a>
		Minutes	CB(4)437/14-15 <a href="http://www.legco.gov.hk/yr14-15/english/panels/tp/minutes/tp20141125.pdf">http://www.legco.gov.hk/yr14-15/english/panels/tp/minutes/tp20141125.pdf</a>
28.1.2015	Council meeting	Hon LEUNG Che-cheung raised a question on Light Rail service	<a href="http://www.info.gov.hk/gia/general/201501/28/P201501280459.htm">http://www.info.gov.hk/gia/general/201501/28/P201501280459.htm</a>
17.7.2015	Panel on Transport	Administration's paper on planning of transport infrastructure in Northwest New Territories	CB(4)1306/14-15(04) <a href="http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20150717cb4-1306-4-e.pdf">http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20150717cb4-1306-4-e.pdf</a>
		Minutes	CB(4)228/15-16 <a href="http://www.legco.gov.hk/yr14-15/english/panels/tp/minutes/tp20150717.pdf">http://www.legco.gov.hk/yr14-15/english/panels/tp/minutes/tp20150717.pdf</a>
9.12.2015	Council meeting	Hon Michael TIEN Puk-sun raised a question on train services	<a href="http://www.info.gov.hk/gia/general/201512/09/P201512090545.htm">http://www.info.gov.hk/gia/general/201512/09/P201512090545.htm</a>

<b>Date of meeting</b>	<b>Meeting</b>	<b>Minutes/Paper</b>	<b>LC Paper No.</b>
7.4.2016	Finance Committee (Special meeting)	Replies to initial written questions raised by Finance Committee members in examining the Estimates of Expenditure 2016-2017 (Session No.: 14) (Questions Serial Nos. 0215, 1356, 1623, 3593 and 4740)	<a href="http://www.legco.gov.hk/yr15-16/english/fc/fc/w_q/thb-t-e.pdf">http://www.legco.gov.hk/yr15-16/english/fc/fc/w_q/thb-t-e.pdf</a>
19.4.2016	Subcommittee on Matters Relating to Railways	MTR Corporation Limited's paper on capacity and loading of trains in the MTR network	CB(4)854/15-16(07) <a href="http://www.legco.gov.hk/yr15-16/english/panels/tp/tp_rdp/papers/tp_rdp20160419cb4-854-7-e.pdf">http://www.legco.gov.hk/yr15-16/english/panels/tp/tp_rdp/papers/tp_rdp20160419cb4-854-7-e.pdf</a>
		MTR Corporation Limited's response to the motion on "Loading of Light Rail" and the supplementary information requested by members at the meeting on 19 April 2016	CB(4)978/15-16(01) <a href="http://www.legco.gov.hk/yr15-16/chinese/panels/tp/tp_rdp/papers/tp_rdp20160419cb4-978-1-c.pdf">http://www.legco.gov.hk/yr15-16/chinese/panels/tp/tp_rdp/papers/tp_rdp20160419cb4-978-1-c.pdf</a>
		Minutes	CB(4)1282/15-16 <a href="http://www.legco.gov.hk/yr15-16/english/panels/tp/tp_rdp/minutes/rdp20160419.pdf">http://www.legco.gov.hk/yr15-16/english/panels/tp/tp_rdp/minutes/rdp20160419.pdf</a>