

Further Information on Tunnel Strengthening Works

The works are required due to a common phenomenon, known as tunnel squatting, which may lead to disruptions in train operations and structural defects in the tunnel in the long term if left unaddressed. The tunnel squatting is caused by the soft marine clay that some stretches of CCL tunnels are built in. We have been monitoring the situation over the past decade. Based on our comprehensive scan since the earlier works in the tunnels between Promenade and Nicoll Highway stations were carried out in 2023, we have identified three localised sectors of the CCL tunnels between Stadium and Paya Lebar stations that are more affected by tunnel squatting.

2 LTA has engaged expert consultants to carry out detailed assessments. They have confirmed that train operations can continue safely in the affected CCL tunnels, while LTA closes each tunnel in turn at the three localised sectors of the CCL tunnels between Stadium and Paya Lebar stations (~450 metres in total length) to carry out tunnel strengthening works. This requires heavy machinery and several work teams to be deployed to install steel plates along the circumference of the affected tunnel segments. As such, longer blocks of engineering hours are required to ensure that strengthening works can be carried out safely and effectively. LTA aims to complete these works before the opening of CCL6.

3 LTA has studied best practices in Shanghai, Taipei, Busan, Barcelona and Lisbon where similar engineering challenges were encountered. In some of these countries, full-scale tunnel segments loading tests have also been conducted to establish the conditions for tunnel safety to be maintained against long-term tunnel squatting, and similar measures have been carried out to address this issue.

4 To facilitate the works, the following service adjustments are needed along the CCL (refer to [Annex B](#) for the service changes):

- a. Peak-hour headways between HarbourFront and Paya Lebar stations will increase to about three minutes, from the current two minutes;
- b. Headways for CCL single platform services between Paya Lebar and Mountbatten stations will increase to 10 minutes, from the current three minutes;
- c. CCL service headways between Mountbatten and Dhoby Ghaut/ Marina Bay stations will also increase to about 10 minutes, from the current 6 minutes.

5 Therefore, we expect CCL interchange stations (such as Bishan, Serangoon and Buona Vista) to be crowded during morning and evening peak periods. During these periods, additional waiting time could extend to up to 30 minutes compared to typical travel times. Commuters are encouraged to plan ahead for alternative travel routes and travel timings to get to their destinations.